

# STAFF REPORT

## Rezoning #19CZ16 Horton Park PUD Amendment & TF-CZ

November 6, 2019 Town Council Meeting



All property owners and neighborhood associations within 300 feet of this rezoning have been notified per UDO Sec. 2.2.11 *Public Notification*.

### **BACKGROUND INFORMATION:**

**Location:** 5100, 5101, & 5220 Jessie Drive; 0 Dezola Street; and 8140 (portion of), 8252, 8306 & 8308 Smith Road

**PINs:** 0751421387, 0751310079, 0751319308, 0750390993, 0751400194, 0750398682, 0750495371, 0750299342, 0750280998 (portion of), 0750270906, 0750274707, 0750278677, 0750278925

**Applicant/Owners:** Jeff Roach, Peak Engineering & Design / MFW Investments, LLC; Horton Park MH, LLC; Mary E. Horton; MFWIRA, LLC; Kimberly Horton & Loomis Horton III

### **PROJECT DESCRIPTION:**

**Acreage:** ±146.9

**Current Zoning:** Planned Unit Development-Conditional Zoning (PUD-CZ #18CZ04)

**Proposed Zoning:** Planned Unit Development-Conditional Zoning (PUD-CZ) (127.84 acres) and Tech/Flex-Conditional Zoning (TF-CZ) (19.06 acres)

### **2045 Land Use Map:**

Within proposed PUD-CZ area: Medium Density Residential, High Density Residential, High Density Residential/Office Employment

Within proposed TF-CZ area: Office Employment/Industrial Employment

**Town Limits:** ETJ

### **Adjacent Zoning & Land Uses:**

	<b>Zoning</b>	<b>Land Use</b>
<b>North:</b>	Light Industrial-Conditional Zoning (LI-CZ #17CZ19); Residential Agricultural (RA)	Vacant; Single-Family Residential
<b>South:</b>	Medium Density Residential-Conditional Zoning (MD-CZ #15CZ24); Rural Residential (RR); Planned Unit Development-Conditional Zoning (PUD-CZ #11CZ12)	Vacant; Single-Family Residential
<b>East:</b>	Residential Agricultural (RA); Rural Residential (RR)	Vacant; Single Family Residential; Sorrell Landfill (closed)
<b>West:</b>	Rural Residential (RR); Residential Agricultural (RA)	Vacant

**EXISTING CONDITIONS:** The subject properties are vacant and wooded. Two streams bisect the property from east to west. The Colonial Gas pipeline bisects the property from north to south.

**NEIGHBORHOOD MEETING:** The applicant conducted a neighborhood meeting on June 27, 2019. The neighborhood meeting report is attached.

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### 2045 LAND USE MAP:

The 2045 Land Use Map classifications for the properties subject to this rezoning are as follows:

- Within proposed PUD-CZ area: Medium Density Residential, High Density Residential, High Density Residential/Office Employment
- Within proposed TF-CZ area: Office Employment/Industrial Employment

The proposed amendments to the Horton Park PUD (PUD-CZ) and the proposed TF-CZ zoning district are consistent with those classifications.

### TECH/FLEX-CONDITIONAL ZONING REQUEST:

The 19.06 acres requested to be rezoned to TF-CZ is currently approved as POD 2 of the Horton Park PUD. The applicant desires to remove this area from the PUD. The uses proposed are identical to those currently allowed in POD 2 with the exception of "Church or place of worship" which has been added. The building height and architectural conditions are also identical to those that are applicable to POD 2. Condition #6 has also been added.

### Proposed Zoning Conditions:

#### Limitation of Uses:

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

- |                                   |  |                                     |
|-----------------------------------|--|-------------------------------------|
| 1. Church or place of worship     | 13. Restaurant, general                | 26. Personal service                |
| 2. Day care facility              | 14. Dispatching office                 | 27. Pharmacy                        |
| 3. Drop-in or short-term day care | 15. Medical or dental office or clinic | 28. Printing and copying service    |
| 4. Government services            | 16. Medical or dental laboratory       | 29. Real estate sales               |
| 5. Veterinary clinic or hospital  | 17. Office, business or professional   | 30. Repair services, limited        |
| 6. Vocational school              | 18. Publishing office                  | 31. Studio for art                  |
| 7. Utility, minor                 | 19. Research facility                  | 32. Tailor shop                     |
| 8. Botanical garden               | 20. Artisan studio                     | 33. Upholstery shop                 |
| 9. Entertainment, indoor          | 21. Convenience store                  | 34. Pet services                    |
| 10. Greenway                      | 22. Convenience store with gas sales   | 35. Laboratory, industrial research |
| 11. Park, active                  | 23. Grocery, general                   | 36. Microbrewery                    |
| 12. Park, passive                 | 24. Grocery, specialty                 | 37. Microdistillery                 |
|                                   | 25. Health/fitness center or spa       |                                     |

#### Conditions:

1. Maximum non-residential building height is 65'.
2. Building shall be architecturally compatible through the use of similar colors and building materials. Buildings shall be consistent in scale, massing, style, and relationship to adjacent streets.
3. Building placement shall be done to maximize parking in the rear or side of buildings. Drive-thrus, pick-up windows, loading areas, trash facilities, and other accessory items for uses are encouraged to be oriented away from adjacent streets.
4. Buildings shall have vertical breaks across any facade which faces an adjacent street. Windows and other store front treatments shall be proportional to the building height and width. Horizontal and vertical setbacks shall be used to provide a visual break in the building mass. Various architectural



features shall be incorporated, including roofline changes, parapet heights, columns, piers, and material patterns to create various façade breaks.

5. Exterior materials for non-residential structures shall be a combination of materials. The primary façade (front) or any façade facing a street shall include:
  - Brick
  - Wood
  - Stacked stone or other native stone
  - Decorative block (integrally colored or textured) masonry units
  - EIFS cornices and parapet trim (EIFS or stucco shall not be used within 4 feet of ground and shall be limited to 25% of each building façade)
  - Precast concrete
6. **The developer of the Horton Park PUD or the developer of the subject property shall construct and dedicate the portion of the Collector Street as shown on the Apex Transportation Plan on the subject property.**

### PLANNED UNIT DEVELOPMENT CHANGES:

The applicant is proposing changes to the approved PUD as shown below. The total number of residential units and the permitted uses are not proposed to be amended.

1. Removes POD 2 (19.06 acres) from the PUD. That area is currently approved for non-residential uses and is proposed to be rezoned to TF-CZ with the uses and conditions as described above.
2. Changes the phasing and timing of required road improvements (details in the “APEX TRANSPORTATION PLAN/ACCESS and CIRCULATION” section of this report).

### PHASING OF PUD:

#### History of changes to phasing:

The original PUD (#17CZ19) was approved in November 2017 with two (2) options for “Residential Development Restrictions”. Option 1 included three (3) phases with thresholds for how many residential units could be developed as certain roadway improvements were made. No restriction on the non-residential sections of Horton Park was provided. Option 2 allowed all lots and units within Horton Park to be released from any development timeline restrictions identified in Option 1 with the completion of the extension of Jessie Drive from Highway 55 to Ten Ten Road as a 2-lane roadway section.

In May 2018, a PUD amendment (#18CZ04) was approved that increased the number of residential units that can be platted or permitted in Phase I from 200 to 250 units while reducing the number of residential units in Phase II from 100 to 50 units. The developer also committed to completing the east-west Major Collector to Smith Road in Phase I. The 50 units in Phase II cannot be platted or permitted prior to the completion of additional through lanes associated with the NCDOT U-5825 project (Ten Ten Road widening). The remainder of the units within the PUD (Phase III) cannot be platted or permitted until the Jessie Drive extension from Highway 55 to Ten Ten Road has been let for construction. Option 2 remained as originally approved.



### **Proposed phasing:**

The applicant is proposing to remove references to Option 1 and Option 2 and instead divide the project into two (2) phases as follows:

#### **Phase I:**

Phase I includes the development of all single-family residential lots and townhome lots south of the PUD boundary located along the creek on the southern portion of the N/F Cash Property (PIN 0751-31-0079). This includes PODs 5–8, the East-West Major Collector Street from Smith Road to the western project boundary, and the North-South Collector Street from Colby Chase Drive to the boundary of the PUD located along the creek on the southern portion of the N/F Cash Property (PIN 0751-31-0079).

#### **Phase II:**

Phase II includes the development of the single-family, townhomes, and/or apartments along the Jessie Drive corridor. This specifically includes PODs 3 and 4. Phase II also includes the construction of the North-South Major Collector from the Phase I terminus to Jessie Drive and the construction of Jessie Drive from the current terminus to the North-South Major Collector Street.

Staff has the following concerns with the proposed change in phasing:

- The North-South Collector would not be completely built from Colby Chase Drive to Jessie Drive and Jessie Drive would not be built and improved from the North-South Collector Street to Ten Ten Road in Phase I.
- The proposed Phase I includes approximately 80 more lots than in the current Option 1, Phase I.
- There are no longer any restrictions on the number of permitted units tied to the completion of the State's improvements to Ten Ten Road and the beginning of construction of Jessie Drive from the N-S Collector Street to Highway 55. The result is the potential for 671 residential units to be approved prior to those improvements.
- The changes in phasing and timing puts a greater burden of traffic on Smith Rd, the Smith Rd/Stephenson Rd intersection, Ten Ten Road, and the Pemberley and Miramonte subdivisions.

### **APEX TRANSPORTATION PLAN/ACCESS and CIRCULATION:**

As part of this PUD amendment, the applicant is proposing to change the phasing and therefore the timing of the road improvements that were approved in the current PUD #18CZ04. A revised TIA was completed on July 2, 2019 to account for the changes in phasing. Staff's TIA review letter is attached to the staff report.

Staff noted the following in the August 7, 2019 TIA review letter:

- The TIA assumed a build-out year of 2024 for Phase I and 2026 for Phase II.
- The TIA assumed for the Phase I build-out that the Ten Ten Road improvements would be constructed by 2024 as opposed to the 2023-2025 construction timeframe the State indicated at that time. It is now known that the construction has been delayed until 2029.
- For Phase II, the TIA assumed that the Jessie Drive east-west connection between Ten Ten Rd and NC 55 will be constructed by the Town along with geometric improvements at Jessie Drive and Ten Ten Road. It is important to note that Jessie Drive construction is not funded in the 2019-2020 Capital Improvements Plan (CIP) and is subject to reprioritization in 2020.
- **For many of the impacted intersections, Traffic Engineering staff recommended that the phasing**

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**and timing of road improvements remain the same as currently approved in #18CZ04.** Please refer to the August 7, 2019 TIA review letter which follows the staff report for concerns noted by staff at each intersection.

**After further discussions with staff after the Planning Board meeting, the applicant agreed to submit another addendum to the TIA in order to make corrections to the timing of the State's improvements to Ten Ten Rd and to remove references to the Town's completion of Jessie Drive to Hwy 55. The addendum was received on October 25, 2019 and was reviewed with comments provided. As of the deadline for this staff report, revisions had not been received. Staff's review and comments will be available at the November 6, 2019 Town Council meeting.**

#### **APPLICANT'S PROPOSED ROAD IMPROVEMENTS:**

The following is the proposed version of the required Transportation Improvements as provided in the PUD text (note that staff disagrees with many of the proposed changes to timing of road improvements - please refer to the August 7, 2019 TIA review letter which follows the staff report for concerns noted by staff):

The Developer shall coordinate with NCDOT all planned improvements on state maintained roadways. In some cases, zoning conditions are subject to NCDOT review and approval and may change to conform to NCDOT approvals. Turn bay storage lengths refer to the length of full width lane provided exclusive of the 100-foot taper in each case. Jessie Drive shall continue as a state maintained roadway for all existing and proposed sections, and the developer shall dedicate the right-of-way pursuant to the current Town of Apex Transportation Plan, currently a 110-foot public right of way along all sections of Jessie Drive within the development.

The timing of the roadway improvements will be coordinated with Apex Transportation Staff during the Master Subdivision Plan and Construction Document review based upon the recommendations within the approved Traffic Impact Analysis (TIA) and according to the phasing plan provided in Section 17 - Phasing. The following recommendations are based upon the revised TIA which will supersede the TIA dated May 31, 2017, the Colby Chase Addendum dated August 30, 2017, and the TIA Update date July 2, 2019.

#### **PHASE I TRANSPORTATION IMPROVEMENTS**

##### **US 1 Southbound Ramps / Waterford Green Drive at Center Street**

- The Developer shall coordinate with NCDOT and Town staff in order to conduct a signal timing study and implement traffic signal timing modifications within the scope of the closed loop-system for Center Street/Ten-Ten Road, including this intersection, Lufkin Road and Reliance Avenue. The developer shall be obligated to pursue this effort only once during the development build-out schedule as directed by the Town of Apex Senior Transportation Engineer.
- The Developer shall provide intersection signal timing evaluation and modifications at a time to be determined by the Town of Apex Senior Transportation Engineer within the following schedule: The timing evaluation shall occur after the first Final Plat is recorded and prior to the recordation of the Final Plat for no more than 250 dwelling units of single-family and/or townhomes, or the issuance building permits for 250 apartment units, or any combination thereof.



**Ten Ten Road at Smith Road**

- The Developer shall extend the existing westbound left-turn lane to provide a minimum of 350 feet of storage and appropriate taper.
- The Developer shall construct the aforementioned improvements at the Ten Ten Road/Smith Road intersection at the time the East-West Collector Street is constructed and platted to Smith Road.

**Smith Road at Stephenson Road/Smith Road**

- The Developer shall construct an eastbound left-turn lane with a minimum of 100 feet of storage and appropriate taper.
- The Developer shall monitor this intersection for installation of all-way stop control and provide for the all-way stop conversion if warranted and permitted by NCDOT.
- The Developer shall construct the aforementioned improvements at the Smith Road/Stephenson Road intersection at the time the East-West Collector Street is constructed and platted to Smith Road.

**Smith Road at East-West Collector Street**

- The Developer shall construct a southbound right-turn lane with a minimum of 100 feet of storage and appropriate taper.
- The Developer shall construct a Major Collector Street from the North-South Collector Street to Smith Road on a 60-foot public right of way for the entire length.
- The Developer shall provide access to existing residential properties on Dezola Street in a manner that avoids residential driveways directly accessing any Major Collector Streets.

**East Williams Street at Straywhite Avenue**

- The Developer shall stripe the Straywhite Avenue approach to E. Williams Street for two lanes with 75 feet of storage.
- The Developer shall monitor the intersection and install a traffic signal if warranted and permitted by NCDOT.
- The Developer shall complete the monitoring period as directed by the Town of Apex Senior Transportation Engineer within the following schedule: The monitoring shall occur after the opening of Colby Chase Drive from the Pemberley subdivision to the Merion Subdivision but no later than the recording of the Final Plat for 250 dwelling units of single-family and/or townhomes, or the issuance of building permits for 250 apartment units, or any combination thereof.

**East Williams Street at Technology Drive at NC 55**

- Intersection included in the MOU. No improvements warranted per TIA.

**North-South Collector Street**

- The Developer shall construct the portion of the North-South Collector Street from Colby Chase Drive to the PUD boundary at the southern creek on N/F Cash Property (PIN 0751-31-0079) to a Minor Collector Street typical section on a 60-foot public right-of-way.

**PHASE II TRANSPORTATION IMPROVEMENTS**

The full project build-out includes the following intersections per the approved MOU.

**Jessie Drive at Ten-Ten Road**

- The Developer shall construct a westbound left-turn lane with a minimum of 100 feet of storage and



- appropriate taper prior to the pending state TIP project.
- The Developer shall construct an eastbound right-turn lane with a minimum of 200 feet of storage and appropriate taper prior to the pending state TIP project.
  - The Developer shall construct a northbound right-turn lane with 100 feet of storage and appropriate taper prior to the pending state TIP project.
  - The Developer shall monitor this intersection and install a traffic signal if warranted and permitted by NCDOT prior to the pending state TIP project.
  - The Developer shall construct the improvements at the aforementioned Jessie Drive/Ten Ten intersection at the time Jessie Drive is extended to the Horton Park North-South Collector/Production Drive intersection.
  - If the traffic signal is not warranted prior to the first Final Plat, the developer shall provide a performance bond for the signal based on an engineer's estimate of final costs. The performance bond shall remain in place for a period of 5 years, or until the last Final Plat for the development, whichever comes first. Once the signal is warranted, the developer shall install the signal within 6 months plus time for any delays due to right-of-way acquisition and utility relocation but not to exceed 12 months.

**Jessie Drive at the North-South Collector Street**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions at both intersections.
- The Developer shall construct the portion of the North-South Collector Street from the PUD boundary on the N/F Cash property (PIN 0751-31-0079) to Jessie Drive to a Major Collector Street typical section on a 60-foot public right of way.
- The Developer shall construct the aforementioned improvements prior to recordation of the first Final Plat for single-family and/or townhomes, or the issuance of the first building permit for apartments within Phase II of the development.

**Jessie Drive at Site Drive #1 (PODs 3 & 4)**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions.

**Jessie Drive at Site Drive #2 (POD 4)**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions.

The following roadway improvements are internal to the project and do not require NCDOT review or approval. These improvements shall be reviewed with Apex staff to verify compliance with design standards during the zoning, master subdivision, and construction document stages of the project as appropriate. Improvements shall be constructed and platted as the connections are created for each development POD. Said improvements were identified within the Traffic Impact Analysis dated May 31, 2017 with the Colby Chase Addendum dated August 30, 2017 with no proposed modifications.

**North-South Collector Street at Site Drive #2, #3, and Dezola Street**

- The Developer shall construct single lane eastbound and westbound approaches with stop control, and single lane northbound and southbound free-flow approaches.



**East-West Collector Street at Site Drive #4**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and single lane eastbound and westbound free-flow approaches. Stop control may be reversed subject to future connectivity.

**North-South Collector Street at Colby Chase Drive**

- The Developer shall construct the connection of Colby Chase from Pemberley Subdivision to the Merion Subdivision. The connection of Colby Chase Drive to the state-maintained portion requires NCDOT review and approval.
- The Developer shall construct the connection of the North-South Collector Street to Colby Chase Drive.
- The Developer shall evaluate with Apex staff the option for traffic calming devices along Colby Chase Drive between Pemberley and Merion subdivisions.

**Colby Chase Drive Extension**

- The Developer agrees not to open Colby Chase Drive to the Merion Subdivision until the North-South Collector Street is constructed and open to the public or at the direction of the Town of Apex Senior Transportation Engineer.

**PLANNING STAFF RECOMMENDATION:**

Planning staff recommends denial of the proposed Horton Park PUD amendment and TF-CZ zoning as proposed by the applicant unless the following changes are made:

1. Remove “Church or place of worship” as a permitted use in the TF-CZ zoning district.
2. Maintain phasing and transportation improvement conditions as currently approved in #18CZ04.

**PLANNING BOARD RECOMMENDATION:**

The Planning Board heard this item at their October 14, 2019 meeting and recommended denial of the rezoning as proposed by the applicant by a vote of 5-0.

**ANALYSIS STATEMENT OF THE REASONABLENESS OF THE PROPOSED REZONING:**

This Statement will address consistency with the Town’s comprehensive and other applicable plans, reasonableness, and effect on public interest:

The proposed rezoning is consistent with the 2045 Land Use Plan and other adopted plans in that the 2045 Land Use Map classifies the subject properties as Medium Density Residential, High Density Residential, High Density Residential/Office Employment, and Office Employment/Industrial Employment. These classifications include the PUD-CZ and TF-CZ zoning districts.

However, the proposed rezoning is not reasonable and in the public interest due to the following:

1. The use “Church or place of worship” is not currently an approved use within POD 2 of the PUD and which is now proposed to be changed to TF-CZ. This use does not help to increase the tax base of the town or contribute a significant number of jobs which is more likely to occur with the other permitted uses.





2. The proposed changes in the phasing and timing of road improvements would result in the North-South collector street not being completed in the first phase. This negatively impacts Smith Road, Stephenson Road, and to a smaller extent roads within the Pemberley and Miramonte subdivisions that connect to E. Williams Street/NC 55. These impacts are further exacerbated by the fact that the State has delayed the start of the Ten Ten Road widening project from 2023 to 2029, yet the TIA indicates build-out of Phase I in 2024 and Phase II in 2026.
3. The submitted TIA assumed that the Town is building Jessie Drive, but that project is not currently funded. The Town has a feasibility study underway and the Council will be reviewing the project as part of the Capital Improvements Plan as part of the budget process.

**PLANNED UNIT DEVELOPMENT DISTRICT AND CONDITIONAL ZONING STANDARDS:**

***Standards***

In return for greater flexibility in site design requirements, Planned Development (PD) Districts are expected to deliver exceptional quality community designs that preserve critical environmental resources; provide high quality community amenities; incorporate creative design in the layout of buildings, Resource Conservation Area and circulation; ensure compatibility with surrounding land uses and neighborhood character; provide high quality architecture; and provide greater efficiency in the layout and provision of roads, utilities, and other infrastructure. The Planned Development (PD) Districts shall not be used as a means of circumventing the Town’s adopted land development regulations for routine developments.

1) *Planned Unit Development (PUD-CZ) District*

In approving a Planned Development (PD) Zoning District designation for a PUD-CZ, the Town Council shall find the PUD-CZ district designation and PD Plan for PUD-CZ demonstrates compliance with the following standards:

a) *Development parameters*

- (i) The uses proposed to be developed in the PD Plan for PUD-CZ are those uses permitted in Sec. 4.2.2 *Use Table*.
- (ii) The uses proposed in the PD Plan for PUD-CZ can be entirely residential, entirely non-residential, or a mix of residential and non-residential uses, provided a minimum percentage of non-residential land area is included in certain mixed use areas as specified on the 2045 Land Use Map. The location of uses proposed by the PUD-CZ must be shown in the PD Plan with a maximum density for each type of residential use and a maximum square footage for each type of non-residential use.
- (iii) The dimensional standards in Sec. 5.1.3 *Table of Intensity and Dimensional Standards, Planned Development Districts* may be varied in the PD Plan for PUD-CZ. The PUD-CZ shall demonstrate compliance with all other dimensional standards of the UDO, North Carolina Building Code, and North Carolina Fire Code.
- (iv) The development proposed in the PD Plan for PUD-CZ encourages cluster and compact development to the greatest extent possible that is interrelated and linked by pedestrian ways, bikeways and other transportation systems. At a minimum, the PD Plan must show



sidewalk improvements as required by the Apex Transportation Plan and the *Town of Apex Standard Specifications and Standard Details*, and greenway improvements as required by the Town of Apex Parks, Recreation, Greenways, and Open Space Plan and the Apex Transportation Plan. In addition, sidewalks shall be provided on both sides of all streets for single-family detached homes.

- v) The design of development in the PD Plan for PUD-CZ results in land use patterns that promote and expand opportunities for walkability, connectivity, public transportation, and an efficient compact network of streets. Cul-de-sacs shall be avoided unless the design of the subdivision and the existing or proposed street system in the surrounding area indicate that a through street is not essential in the location of the proposed cul-de-sac, or where sensitive environmental areas such as streams, floodplains, and wetlands would be substantially disturbed by making road connections.
- (vi) The development proposed in the PD Plan for PUD-CZ is compatible with the character of surrounding land uses and maintains and enhances the value of surrounding properties.
- (vii) The development proposed in the PD Plan for PUD-CZ has architectural and design standards that are exceptional and provide higher quality than routine developments. All residential uses proposed in a PD Plan for PUD-CZ shall provide architectural elevations representative of the residential structures to be built to ensure the Standards of this Section are met.
- b) *Off-street parking and loading.* The PD Plan for PUD-CZ shall demonstrate compliance with the standards of Sec. 8.3 *Off-Street Parking and Loading*, except that variations from these standards may be permitted if a comprehensive parking and loading plan for the PUD-CZ is submitted as part of the PD Plan that is determined to be suitable for the PUD-CZ, and generally consistent with the intent and purpose of the off-street parking and loading standards.
- c) *RCA.* The PD Plan for PUD-CZ shall demonstrate compliance with Sec. 8.1.2 *Resource Conservation Area*, except that the percentage of RCA required under Sec. 8.1.2 may be reduced by the Town Council by no more than two percent (2%) provided that:
  - (i) The PD Plan for PUD-CZ includes a non-residential component; or
  - (ii) The PD Plan for PUD-CZ has an overall density of 6 residential units per acre or more.
- d) *Landscaping.* The PD Plan for PUD-CZ shall demonstrate compliance with the standards of Sec. 8.2 *Landscaping, Buffering and Screening*, except that variations from these standards may be permitted where it is demonstrated that the proposed landscaping sufficiently buffers uses from each other, ensures compatibility with land uses on surrounding properties, creates attractive streetscapes and parking areas and is consistent with the character of the area. In no case shall a buffer be less than one half of the width required by Sec. 8.2 or 10 feet in width, whichever is greater.
- e) *Signs.* Signage in the PD Plan for PUD-CZ shall demonstrate compliance with Sec. 8.7 *Signs*, except that the standards can be varied if a master signage plan is submitted for review and approval



concurrent with the PD plan and is determined by the Town Council to be suitable for the PUD-CZ and generally consistent with the intent and purpose of the sign standards of the UDO. The master signage plan shall have design standards that are exceptional and provide for higher quality signs than those in routine developments and shall comply with Sec. 8.7.2 *Prohibited Signs*.

- f) *Public facilities.* The improvements standards and guarantees applicable to the public facilities that will serve the site shall comply with Article 7: *Subdivision* and Article 14: *Parks, Recreation, Greenways, and Open Space*.
- (i) The PD Plan for PUD-CZ demonstrates a safe and adequate on-site transportation circulation system. The on-site transportation circulation system shall be integrated with the off-site transportation circulation system of the Town. The PD Plan for PUD-CZ shall be consistent with the Apex Transportation Plan and the *Town of Apex Standard Specifications and Standard Details* and show required right-of-way widths and road sections. A Traffic Impact Analysis (TIA) shall be required per Sec. 13.19.
- (ii) The PD Plan for PUD-CZ demonstrates a safe and adequate on-site system of potable water and wastewater lines that can accommodate the proposed development, and are efficiently integrated into off-site potable water and wastewater public improvement plans. The PD Plan shall include a proposed water and wastewater plan.
- (iii) Adequate off-site facilities for potable water supply, sewage disposal, solid waste disposal, electrical supply, fire protection and roads shall be planned and programmed for the development proposed in the PD Plan for PUD-CZ, and the development is conveniently located in relation to schools and police protection services.
- (iv) The PD Plan shall demonstrate compliance with the parks and recreation requirements of Sec. Article 14: *Parks, Recreation, Greenways, and Open Space* and Sec. 7.3.1 *Privately-owned Play Lawns* if there is a residential component in the PUD-CZ.
- g) *Natural resource and environmental protection.* The PD Plan for PUD-CZ demonstrates compliance with the current regulatory standards of this Ordinance related to natural resource and environmental protection in Sec. 6.1 *Watershed Protection Overlay District*, Sec. 6.2 *Flood Damage Prevention Overlay District*, and Sec. 8.1 *Resource Conservation*.
- h) *Storm water management.* The PD Plan shall demonstrate that the post-development rate of on-site storm water discharge from the entire site shall not exceed pre-development levels in accordance with Sec. 6.1.7 of the UDO.
- i) *Phasing.* The PD Plan for PUD-CZ shall include a phasing plan for the development. If development of the PUD-CZ is proposed to occur in more than one phase, then guarantees shall be provided that project improvements and amenities that are necessary and desirable for residents of the project, or that are of benefit to the Town, are constructed with the first phase of the project, or, if this is not possible, then as early in the project as is technically feasible.



- j) *Consistency with 2045 Land Use Map.* The PD Plan for PUD-CZ demonstrates consistency with the goals and policies established in the Town’s 2045 Land Use.
- k) *Complies with the UDO.* The PD Plan for PUD-CZ demonstrates compliance with all other relevant portions of the UDO.

**Legislative Considerations**

The Town Council shall find the PUD-CZ and TF-CZ designations demonstrate compliance with the following standards. Sec. 2.3.3.F:

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

- 1) *Consistency with 2045 Land Use Map.* The proposed Conditional Zoning (CZ) District use’s appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Map.
- 2) *Compatibility.* The proposed Conditional Zoning (CZ) District use’s appropriateness for its proposed location and compatibility with the character of surrounding land uses.
- 3) *Zoning district supplemental standards.* The proposed Conditional Zoning (CZ) District use’s compliance with Sec. 4.4 *Supplemental Standards*, if applicable.
- 4) *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use’s minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.
- 5) *Design minimizes environmental impact.* The proposed Conditional Zoning District use’s minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.
- 6) *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use’s avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.
- 7) *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use’s effect on the health, safety, or welfare of the residents of the Town or its ETJ.
- 8) *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.
- 9) *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.
- 10) *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.



August 07, 2019

Joshua Reinke P.E.  
Ramey Kemp & Associates, Inc.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609

Subject: **Staff summary and comments for the Horton Park TIA, 07/02/2019**

Mr. Reinke:

Please review the following summary of my comments and recommendations. You may schedule a meeting with me and your client to discuss at your convenience.

#### Study Area

The TIA proposes to study access to the development for two phases of the project:

Phase I assumes that the Ten-Ten Road improvements proposed in TIP Project U-5825 will be constructed by 2024. However, it is important to note that the draft STIP shows construction in 2023-2025, so Phase I of Horton Park may be at or near build-out a year before road improvements are completed. For the partial build phase (Phase I) the TIA proposes to study the following intersections:

- Smith Road and Dezola Street (primary access)
- Smith Road and Stephenson Road (offsite intersection)
- Ten-Ten Road and Smith Road (offsite intersection)
- E. Williams Street and Straywhite Avenue (secondary access)
- NC 55 and Technology Drive / E. Williams Street (offsite intersection)

Phase II assumes that the Jessie Drive east-west connection between Ten-Ten Road and NC 55 will be constructed by the Town of Apex, as well as geometric improvements at the existing intersection of Jessie Drive and Ten-Ten Road. However, it is important to note that Jessie Drive construction is not funded in the 2019-2020 CIP and subject to reprioritization in 2020. The following additional intersections are included in the study for Phase II based on that assumption:

- Ten-Ten Road and Jessie Drive (primary access)
- NC 55 and Future Jessie Drive Extension (primary access)
- NC 55 and Future Jessie Drive Extension Northbound U-Turnaround (primary access)
- Jessie Drive and North-South Connector (primary access)
- Jessie Drive and Site Drive 1 (primary access)
- Jessie Drive and Site Drive 2 (primary access)

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### Trip Generation

The proposed development is anticipated to be built in two phases. Phase I includes 290 single family homes and 134 townhomes. Phase I is projected to generate approximately 67 new trips entering and 207 new trips exiting the site during the weekday A.M. peak hour and 227 new trips entering and 132 new trips exiting the site during the weekday P.M. peak hour. Phase I of the development is expected to add a total of 3,740 new trips per day to the adjacent roadway network. Phase II of the development includes an additional 78 townhomes, 356 apartments, 40,000 square feet of warehouse, and 40,000 square feet of business park. Phase II is projected to generate approximately 182 new trips entering and 365 new trips exiting the site during the weekday A.M. peak hour and 379 new trips entering and 278 new trips exiting the site during the weekday P.M. peak hour. Phase II of the development is expected to add a total of 8,270 new trips per day to the adjacent roadway network.

### Background traffic

Background traffic consists of 3% annual background traffic growth compounded to build out year 2024 and year 2026 for the two development phases, and the following approved development:

- Stop & Go Gas Station

Additionally, geometric improvements on Ten-Ten Road from NCDOT TIP Project U-5825 are assumed in the background and build out analysis for both phases of the project. Geometric improvements associated with the on-going Town of Apex CIP project for extending and widening Jessie Drive are also assumed in the background and build out analysis for Phase II of the project.

### Trip Distribution and Assignment

Trip distribution to and from the development was evaluated under the two phasing scenarios.

Phase I includes only residential trips:

- 60% to/from the west via Ten-Ten Road
- 15% to/from the east via Ten-Ten Road
- 5% to/from the south via E. Williams Street
- 10% to/from the south via NC 55 Bypass
- 5% to/from the northwest via NC 55
- 5% to/from the south via Stephenson Road

In addition to the distribution for residential trips, Phase II includes the following distribution for industrial/commercial trips:

- 45% to/from the west via Ten-Ten Road
- 30% to/from the east via Ten-Ten Road
- 5% to/from the south via NC 55 Bypass
- 15% to/from the northwest via NC 55
- 5% to/from the south via Stephenson Road

## Traffic Capacity Analysis and Recommendations

Level of Service (LOS) is a grade of A through F assigned to an intersection, approach, or movement to describe how well or how poorly it operates. LOS A through D is considered acceptable for peak hour operation. LOS E or F describes potentially unacceptable operation and developers may be required to mitigate their anticipated traffic impact to improve LOS based on the Apex Unified Development Ordinance (UDO).

Tables 1 through 11 describe the levels of service (LOS) for the scenarios analyzed in the TIA. "NA" is shown when the scenario does not apply. The scenarios are as follows:

- **Existing 2019** – Existing year 2019 traffic grown from year 2017 traffic counts.
- **No Build 2024** – Projected year (2024) traffic with background growth, approved development traffic and committed transportation improvements by others. *Additional lanes from TIP Projects U-5825 (Ten-Ten Rd Widening) are included.*
- **Build 2024** – Phase I projected year (2024) with background traffic and site build-out including recommended improvements where applicable.
- **No Build 2026** – Projected year (2026) traffic with background growth, approved development traffic and committed transportation improvements by others. *Additional lanes from TIP Projects U-5825 (Ten-Ten Rd Widening) as well as Town of Apex Jessie Drive CIP project which includes improvements at Ten-Ten Road, and the Jessie Drive Extension to NC 55 with superstreet at NC 55.*
- **Build 2026** – Phase II projected year (2026) with background traffic and site build-out including recommended improvements where applicable.

**Smith Road and Dezola Street (unsignalized)**

<b>Table 1: A.M. / P.M. Peak Hour Unsignalized Levels of Service Smith Road and Dezola Street</b>					
	<b>Existing 2019</b>	<b>No Build 2024</b>	<b>Build 2024</b>	<b>No Build 2026</b>	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
<b><i>Eastbound (Dezola Street)</i></b>	<i>A / A<sup>2</sup></i>	<i>A / A<sup>2</sup></i>	<i>B / A<sup>2</sup></i>	<i>A / A<sup>2</sup></i>	<i>A / A<sup>2</sup></i>
<b><i>Northbound (Smith Road)</i></b>	<i>A / A<sup>1</sup></i>	<i>A / A<sup>1</sup></i>	<i>A / A<sup>1</sup></i>	<i>A / A<sup>1</sup></i>	<i>A / A<sup>1</sup></i>
<b><i>Southbound (Smith Road)</i></b>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

TIA recommendations:

- The TIA recommends the construction of a southbound right-turn lane with a minimum of 75 feet of storage in Phase I. In Phase II the TIA recommends no additional improvements.

Apex staff recommendations:

- Per Town of Apex Transportation Plan, Dezola Street is planned as a major collector street. It's recommended that the development reconstruct the existing unpaved Dezola Street to a standard Major Collector Street typical section for future development traffic. In regard to intersection capacity, Apex staff agrees with the recommendations. Projected traffic is anticipated to experience short delays at this intersection.



## Smith Road and Stephenson Road (unsignalized)

<b>Table 2: A.M. / P.M. Peak Hour Unsignalized Levels of Service Smith Road and Stephenson Road</b>					
	<b>Existing 2019</b>	<b>No Build 2024</b>	<b>Build 2024</b>	<b>No Build 2026</b>	<b>Build 2026</b>
<b>Overall</b>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>	<u>N / A</u>
<b>Eastbound (Smith Road)</b>	A / A <sup>1</sup>	B / A <sup>1</sup>	B / A <sup>1</sup>	B / A <sup>1</sup>	B / A <sup>1</sup>
<b>Westbound (Stephenson Road)</b>	NA	NA	NA	NA	NA
<b>Southbound (Smith Road)</b>	B / C <sup>2</sup>	C / E <sup>2</sup>	E / F <sup>2</sup>	C / F <sup>2</sup>	C / F <sup>2</sup>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

### TIA recommendations:

- The TIA recommends the construction of an eastbound left turn lane on Smith Road with minimum of 100 feet storage during Phase I of the project. The TIA evaluated a traffic signal to improve queuing and delays on the southbound approach, however the traffic volume at this intersection is not projected to be high enough in future scenarios to warrant a traffic signal. The TIA recommends no additional improvements for Phase II of the project.

### Apex staff recommendations:

- In Phase I the primary access point for the development will be off Smith Road, and the development is projected to increase traffic volumes at the intersection of Smith Road and Stephenson Road by 18% in the A.M. peak and 22% in the P.M. peak hours. The addition of development traffic causes LOS to deteriorate to LOS E and LOS F in the A.M. and P.M. peak hours, respectively. Average vehicle delays and 95<sup>th</sup> percentile queues were analyzed to be heaviest in the southbound stop-controlled direction during the P.M. peak hour. Average vehicle delays were analyzed to increase from 47.1 seconds per vehicle to 172.4 seconds per vehicle and 95<sup>th</sup> percentile queues were analyzed to increase from 14 vehicles (350 feet) to 33 vehicles (825 feet) from the 2024 No Build to the 2024 Build condition. The upstream intersection of Smith Road and Ten-Ten Road is 1,000 feet to the north, therefore about 80 percent of the roadway between the intersections is projected to be blocked by traffic. The queueing creates an access issue for residents off Smith Road, as well as safety and access issues for fire and emergency services since this roadway serves as the only connection from the north to a large residential area.

Town staff evaluated several additional options to mitigate congestion associated with development traffic. Based on HCS7 analysis, it was determined that in conjunction with

the Ten-Ten Road TIP project to reduce congestion upstream at Ten-Ten Road, a single-lane roundabout would operate at LOS B during the most critical P.M. peak hour and reduce 95<sup>th</sup> percentile queues to 7 vehicles (175 ft) on the southbound approach and overall intersection delay to 10.8 seconds per vehicle. However, this relies on completion of the Ten-Ten Road TIP project prior to the anticipated date in the draft STIP. Based on this analysis and considering project schedules and funding status of Ten-Ten Road and Jessie Drive, Town staff recommend extension of Jessie Drive from Ten-Ten Road to just beyond the North-South Connector road with connection of the North-South Connector road from Jessie Drive to Colby Chase Drive, as well as providing turn lane improvements as previously committed in the approved PD Plan with Phase I of the development.

**Ten-Ten Road and Smith Road (signalized)**

<b>Table 3: A.M. / P.M. Peak Hour Signalized Levels of Service Ten-Ten Road and Smith Road</b>					
	<b>Existing 2019</b>	<b>No Build 2024</b>	<b>Build 2024</b>	<b>No Build 2026</b>	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>D / C</u>	<u>B / B</u>	<u>B / B</u>	<u>B / B</u>	<u>B / B</u>
<b><i>Eastbound (Ten-Ten Road)</i></b>	<i>C / C</i>	<i>B / B</i>	<i>B / B</i>	<i>B / B</i>	<i>B / B</i>
<b><i>Westbound (Ten-Ten Road)</i></b>	<i>B / B</i>	<i>B / B</i>	<i>B / B</i>	<i>B / B</i>	<i>B / B</i>
<b><i>Northbound (Smith Road)</i></b>	<i>E / D</i>	<i>C / C</i>	<i>C / C</i>	<i>C / C</i>	<i>C / C</i>

TIA recommendations:

- The TIA does not recommend any improvements to the intersection by the developer. NCDOT TIP Project U-5825 is expected to widen Ten-Ten Road to a 4-lane median divided facility with left and right turn lanes at the traffic signal. The improvements are expected to be complete prior to Phase I build out of the development. With background and development traffic the signal was analyzed to operate at LOS C in both the A.M. and P.M. peak hours for both Phase I and Phase II build and no build scenarios.

Apex staff recommendations:

- As previously noted, the Ten-Ten Road TIP improvements are not anticipated to be completed by 2024. Therefore, Apex staff recommend extension of the westbound left turn lane to 350 feet when the East-West Collector Street is platted to Smith Road as previously committed in the approved PD Plan with Phase I of the development unless NCDOT recommends against the interim improvement. With the widening expected to be completed by NCDOT TIP Project U-5825, the most critical peak hour of operations that was analyzed was the P.M. peak hour in the 2024 Build scenario. Analysis showed

all approaches and movements to operate at LOS D or better during that critical peak, with overall average intersection delay of 18 seconds per vehicle.

**E. Williams Street and Straywhite Avenue (unsignalized)**

<b>Table 4: A.M. / P.M. Peak Hour Unsignalized Levels of Service E. Williams Street and Straywhite Avenue</b>					
	<b>Existing 2019</b>	<b>No Build 2024</b>	<b>Build 2024</b>	<b>No Build 2026</b>	<b>Build 2026</b>
<b>Overall</b>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>
<b>Westbound (Straywhite Avenue)</b>	<i>F / C<sup>2</sup></i>	<i>F / C<sup>2</sup></i>	<i>F / C<sup>2</sup></i>	<i>F / D<sup>2</sup></i>	<i>F / D<sup>2</sup></i>
<b>Northbound (E. Williams Street)</b>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>	<i>NA</i>
<b>Southbound (E. Williams Street)</b>	<i>B / A<sup>1</sup></i>	<i>C / B<sup>1</sup></i>	<i>C / B<sup>1</sup></i>	<i>C / B<sup>1</sup></i>	<i>C / B<sup>1</sup></i>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

TIA recommendations:

- The TIA recommends to stripe a lane line down the center of the existing 21-foot wide outbound lane of Straywhite Avenue. The pavement striping will provide the westbound approach of Straywhite Avenue with exclusive left turn and right turn lanes. A traffic signal was considered at this location, but based on traffic volumes and the residential nature of the minor street approach, it is not anticipated to meet signal warrants.

Apex staff recommendations:

- Apex staff recommend the previously approved PD Plan conditions for monitoring the intersection for a traffic signal during Phase I of the development and installing if permitted by NCDOT. Per the TIA recommendation, staff concur with striping a 75-foot long solid white lane line through the center of the westbound approach and provide stop bar and turn arrow pavement markings per NCDOT guidance. The striping will help with lane assignment at the approach, allowing right turn vehicles more gap opportunities to exit the subdivision. The operations are not anticipated to improve the LOS on the approach, however average vehicle delays are projected to decrease from 322 seconds/vehicle to 251 seconds/vehicle from the 2024 No Build to the 2024 Build condition in the critical A.M. peak hour.

**NC 55 and Technology Drive / E. Williams Street (signalized)**

<b>Table 5: A.M. / P.M. Peak Hour Signalized Levels of Service NC 55 and Technology Drive / E. Williams Street</b>					
	<b>Existing 2019</b>	<b>No Build 2024</b>	<b>Build 2024</b>	<b>No Build 2026</b>	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>E/C</u>	<u>F/E</u>	<u>F/E</u>	<u>F/E</u>	<u>F/E</u>
<b><i>Eastbound (Technology Drive)</i></b>	<i>D/D</i>	<i>E/E</i>	<i>E/E</i>	<i>E/E</i>	<i>E/E</i>
<b><i>Westbound (E. Williams Street)</i></b>	<i>F/A</i>	<i>F/A</i>	<i>F/B</i>	<i>F/A</i>	<i>F/B</i>
<b><i>Northbound (NC 55)</i></b>	<i>C/C</i>	<i>C/C</i>	<i>C/C</i>	<i>C/C</i>	<i>C/C</i>
<b><i>Southbound (NC 55)</i></b>	<i>C/C</i>	<i>C/F</i>	<i>C/F</i>	<i>C/F</i>	<i>C/F</i>

TIA recommendations:

- The TIA does not recommend any improvements to the intersection by the developer. The development is projected to add approximately 1% of traffic to the intersection. The addition of traffic is expected to increase average intersection delays by 9 seconds per vehicle during the A.M. peak and 4 seconds per vehicle during the P.M. peak in the Build 2024 scenario, and the impacts on overall intersection delays are even less when the development is fully build out in the Build 2026 scenario, due to the assumption that a large portion of development trips will be diverted to the Jessie Drive connection.

Apex staff recommendations:

- Apex staff concurs with the recommendation. Even though this intersection is projected to operate at LOS E or F in the future build and no build scenarios, the volume of development traffic at this intersection is not high enough to meet the threshold for traffic capacity improvements based on the UDO.

## Ten-Ten Road and Jessie Drive

<b>Table 6: A.M. / P.M. Peak Hour Levels of Service Ten-Ten Road and Jessie Drive</b>			
	<b>Existing 2019</b>	<b>No Build 2026</b>	<b>Build 2026 Signalized</b>
<b><u>Overall</u></b>	<u>NA</u>	<u>NA</u>	<u>B / B</u>
<b><i>Eastbound (Ten-Ten Road)</i></b>	NA	NA	B / B
<b><i>Westbound (Ten-Ten Road)</i></b>	A / B <sup>1</sup>	B / D <sup>1</sup>	B / B
<b><i>Northbound (Jessie Drive)</i></b>	C / F <sup>2</sup>	D / F <sup>2</sup>	C / C

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

### TIA recommendations:

- The intersection of Ten-Ten Road and Jessie Drive was analyzed under the assumption that the widening expected to be done as part of NCDOT TIP Project U-5825, and the Jessie Drive east-west connection between Ten-Ten Road and NC 55 will be constructed prior to Phase II of the development moving forward. Under these assumptions Phase II of the development has connectivity to both Ten-Ten Road and NC 55 via Jessie Drive. The intersection of Ten-Ten Road and Jessie Drive was analyzed with three through lanes and a right turn lane in the eastbound direction, two through lanes and a left turn lane in the westbound direction, and one left turn and one right turn lane in the northbound direction. Based on these assumptions, analysis showed the northbound stop-controlled approach to fail in the P.M. peak hour in the No Build condition. To improve operations, the TIA recommends to monitor this intersection for signalization, and install a signal if warranted. With the signal, this intersection is projected to operate at an overall LOS B in both peak hours of the day in the 2026 Build scenario with minimum delays.

### Apex staff recommendations:

- As noted previously, Apex staff recommend extension of Jessie Drive from Ten-Ten Road to just beyond the North-South Connector road with connection of the North-South Connector road from Jessie Drive to Colby Chase Drive, as well as providing turn lane improvements as previously committed in the approved PD Plan with Phase I of the development. The Jessie Drive east-west widening and extension CIP project is currently in feasibility study stage and not yet funded for right of way or construction in the annual budget. Given recent cost estimates it is currently recommended by staff to expand the feasibility study to provide additional information in order to reconsider the project during the next budget cycle. That could result in further delays unknown at this time. The adopted CIP shows \$10,000,000 in FY '20-'21 for right of way and construction but it is anticipated to cost substantially more based on updated estimates

to be further refined in the coming months. Town staff recommend limiting the development build-out similar to the zoning conditions in Section 17 Phasing (“Option 1” and “Option 2”) of the Horton Park PD Plan, approved by Town Council on 4/17/18. Additionally, not all of the existing Jessie Drive east of Horton Park is accepted into the state-maintained system for NCDOT maintenance. The western most 300’ of the existing Jessie Drive paved roadway section is not under NCDOT maintenance. Town staff recommend that this section of Jessie Drive be improved to NCDOT standards and dedicated as a state-maintained roadway as part of any development requirement or CIP project providing connectivity to Ten-Ten Road.

**NC 55 and Future Jessie Drive Extension (signalized)**

<b>Table 7: A.M. / P.M. Peak Hour Signalized Levels of Service NC 55 and Future Jessie Drive Extension</b>		
	<b>No Build 2026</b>	<b>Build 2026</b>
<b><u>Overall</u></b>	<b><u>D / B</u></b>	<b><u>D / C</u></b>
<b><i>Westbound (Jessie Drive)</i></b>	<b><i>F / B</i></b>	<b><i>F / B</i></b>
<b><i>Northbound (NC 55)</i></b>	<b><i>D / B</i></b>	<b><i>D / B</i></b>
<b><i>Southbound Left (NC 55)</i></b>	<b><i>E / B</i></b>	<b><i>E / C</i></b>

TIA recommendations:

- The TIA assumes that the Town of Apex will construct Jessie Drive from Ten-Ten Road to NC 55 to meet the development schedule for Phase II. At the future signalized intersection of NC 55, the TIA assumes a superstreet with a single right turn lane in the westbound direction, two through lanes and a right turn lane in the northbound direction, and two through lanes and a left turn lane in the southbound direction. The TIA does not recommend any improvements at this future signalized intersection to be made by the development. Based on these assumptions, analysis showed this intersection to operate at an overall LOS D or better in both peak hours for both the 2026 No Build and Build scenarios. However the southbound and westbound approaches were analyzed to operate at LOS E or F during the A.M. peak hour, with average vehicles delays of 160 seconds per vehicle on the westbound approach and 77 seconds per vehicle for the southbound left turn.

Apex staff recommendations:

- Based on a more in-depth traffic analysis conducted during the Jessie Drive feasibility study, it was determined that on opening day, the intersection of Jessie Drive and NC 55 will need to be constructed as a superstreet with three northbound through lanes, three southbound through lanes and an exclusive southbound left turn lane with 300 feet of storage, and dual westbound right turn lanes with 200 feet of storage. With these recommendations the intersection is expected to operate at LOS C and D during the A.M. and P.M. peak hours. NCDOT staff have since recommended both the north and south U-turn bulb-outs on NC 55. Town staff recommend the construction of this

intersection per the recommendations of the Jessie Drive feasibility study if/when extended to NC 55. As recommended, a delay in the Town’s CIP project may result in a delay to a portion of Horton Park as was previously approved unless an alternative traffic scenario is presented and accepted by the Town.

**NC 55 and Future Northbound U-Turn (signalized)**

<b>Table 8: A.M. / P.M. Peak Hour Signalized Levels of Service NC 55 and Future Northbound U-Turn</b>		
	<b>No Build 2026</b>	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>N/A</u>	<u>N/A</u>
<b><i>Northbound U-turn (NC 55)</i></b>	<i>C / F</i>	<i>C / F</i>
<b><i>Southbound (NC 55)</i></b>	<i>NA</i>	<i>NA</i>

TIA recommendations:

- The TIA assumes that the Town of Apex will construct Jessie Drive from Ten-Ten Road to NC 55. At the future signalized intersection of NC 55 and Jessie Drive, the TIA assumes a superstreet with a stop-controlled U-turn intersection 500 feet north of Jessie Drive. Analysis assumes two northbound through lanes, a single northbound U-turn lane and two southbound through lanes at the U-turn intersection. The TIA does not recommend any improvements at the U-turn intersection to be made by the development. Based on the assumptions, analysis showed the northbound U-turn to operate at LOS C and F in the A.M and P.M. peak hours for both the 2026 No Build and Build scenarios. The average vehicle delays for the northbound U-turn were analyzed to be 95.6 seconds per vehicle in the P.M. peak during the Build 2026 scenario.

Apex staff recommendations:

- Based on a more in-depth traffic analysis conducted during the Jessie Drive feasibility study, it was determined that on opening day, the intersection of Jessie Drive and NC 55 will need to be constructed as a superstreet with three northbound through lanes, and three southbound through lanes. The U-turn north of Jessie Drive will need to be signalized with and an exclusive northbound left turn lane with 300 feet of storage. With these recommendations the intersection is expected to operate at LOS A and B during the A.M. and P.M. peak hours. Town staff recommend the construction of this intersection per the recommendations of the Jessie Drive feasibility study.

### Jessie Drive and North-South Connector (unsignalized)

<b>Table 9: A.M. / P.M. Peak Hour Unsignalized Levels of Service Jessie Drive and North-South Connector</b>	
	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>N / A</u>
<b><i>Eastbound (Jessie Drive)</i></b>	<i>A / A<sup>1</sup></i>
<b><i>Westbound (Jessie Drive)</i></b>	<i>A / A<sup>1</sup></i>
<b><i>Northbound (North-South Connector)</i></b>	<i>B / B<sup>2</sup></i>
<b><i>Southbound (North-South Connector)</i></b>	<i>B / B<sup>2</sup></i>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

#### TIA recommendations:

- The TIA recommends construction of a new unsignalized intersection that connects the north and south sides of the development to Jessie Drive. The TIA recommends to construct the northbound and southbound approaches with stop control and a single lane of ingress and egress. The TIA assumes that Jessie Drive will be constructed by the Town of Apex with a single through lane in both the eastbound and westbound directions of travel, and recommends to construct additional left turn lanes on the eastbound and westbound approaches with 75 feet of storage and appropriate taper. With the improvements recommended in the TIA, all approaches were analyzed to operate at LOS B or better during both peak hours of the day.

#### Apex staff recommendations:

- Per the Advance Apex transportation plan, staff recommend Jessie Drive to be constructed on 110 feet of right-of-way and the North-South Connector road to be constructed on 60 feet of right-of-way. Apex staff recommends the northbound and southbound approaches be constructed with stop control and single left-through-right turn lanes, per the TIA recommendations; and free-flow eastbound and westbound approaches with single shared through-right lanes, and left-turn lanes with minimum 50 feet of storage and 150 feet of deceleration length and taper per 50 mph design speed. Left turn lanes should be constructed within the space of the divided median setting up future roadway widening to the outside of the roadway for the build-out of the ultimate Jessie Drive 4-lane median divided cross-section. See previous comments concerning Jessie Drive construction.



**Jessie Drive and Site Drive 1 (unsignalized)**

<b>Table 10: A.M. / P.M. Peak Hour Unsignalized Levels of Service Jessie Drive and Site Drive 1</b>	
	<b>Build 2026</b>
<b><u>Overall</u></b>	<u>N / A</u>
<b><i>Eastbound (Jessie Drive)</i></b>	<i>A / A<sup>1</sup></i>
<b><i>Westbound (Jessie Drive)</i></b>	<i>A / A<sup>1</sup></i>
<b><i>Northbound (Site Drive 1)</i></b>	<i>B / B<sup>2</sup></i>
<b><i>Southbound (Site Drive 1)</i></b>	<i>C / C<sup>2</sup></i>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

TIA recommendations:

- The TIA recommends construction of a new unsignalized intersection that connects the north and south sides of the development to Jessie Drive. The TIA recommends to construct the northbound and southbound approaches with stop control and single lanes of ingress and egress. The TIA assumes that Jessie Drive will be constructed by the Town of Apex with a single through lane in both the eastbound and westbound directions of travel, and recommends to construct additional left turn lanes with 50 feet of storage and appropriate taper on the eastbound approach and 75 feet of storage and appropriate taper on the westbound approach. With the improvements recommended in the TIA, all approaches were analyzed to operate at LOS C or better during both peak hours of the day.

Apex staff recommendations:

- Per the Advance Apex transportation plan, staff recommend Jessie Drive to be constructed on 110 feet of right-of-way. Apex staff recommends the northbound and southbound approaches be constructed with stop control and single left-through-right turn lanes per the TIA recommendation; and free-flow eastbound and westbound approaches with single shared through-right lanes, and left-turn lanes with minimum 50 feet of storage and 150 feet of deceleration length and taper per 50 mph design speed. Left turn lanes should be constructed within the space of the divided median setting up future roadway widening to the outside of the roadway for the build-out of the ultimate Jessie Drive 4-lane median divided cross-section. See previous comments concerning Jessie Drive construction.

**Jessie Drive and Site Drive 2 (unsignalized)**

<b>Table 11: A.M. / P.M. Peak Hour Unsignalized Levels of Service Jessie Drive and Site Drive 2</b>	
	<b>Build (2) 2023</b>
<b><u>Overall</u></b>	<u>N / A</u>
<b><i>Eastbound (Jessie Drive)</i></b>	<i>NA</i>
<b><i>Westbound (Jessie Drive)</i></b>	<i>A / A<sup>1</sup></i>
<b><i>Northbound (Site Drive 1)</i></b>	<i>B / B<sup>2</sup></i>

1. Level of service for major-street left turning vehicles
2. Level of service for minor-street stop controlled

TIA recommendations:

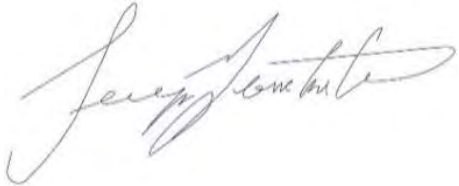
- The TIA recommends construction of a new unsignalized intersection that connects the south side of the development to Jessie Drive. The TIA recommends to construct the northbound approach with stop control and a single lane of ingress and egress. The TIA assumes that Jessie Drive will be constructed by the Town of Apex with a single through lane in both the eastbound and westbound directions of travel, and recommends to construct an additional westbound left turn lane with 50 feet of storage and appropriate taper. With the improvements recommended in the TIA, all approaches were analyzed to operate at LOS B or better during both peak hours of the day.

Apex staff recommendations:

- Per the Advance Apex transportation plan, staff recommend Jessie Drive to be constructed on 110 feet of right-of-way. Apex staff recommends the northbound approach be constructed with stop control and a single left-right turn lane per the TIA recommendation; and free-flow single-lane eastbound and westbound approaches, and a westbound left-turn lane with minimum 50 feet of storage and 150 feet of deceleration length and taper per 50 mph design speed. The left turn lane should be constructed within the space of the divided median setting up future roadway widening to the outside of the roadway for the build-out of the ultimate Jessie Drive 4-lane median divided cross-section. See previous comments concerning Jessie Drive construction.

Please coordinate with the NCDOT District Engineer's Office concerning recommended improvements. Town staff will be available for meetings with NCDOT staff to discuss improvements on state maintained roadways as needed. All recommendations are subject to review by Town Council prior to approval.

Sincerely,

A handwritten signature in cursive script, appearing to read "Serge Grebenschikov".

Serge Grebenschikov, PE  
Traffic Engineer  
919-372-7448

Corrections: Page 10 of 66, Table 1: Existing Roadway Inventory. Jessie Drive speed limit change to 55 mph, E. Williams Street speed limit change to 35 mph, Technology Drive change speed limit to 35 mph per NCDOT North Carolina Speed Limits Map:  
<http://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=978abf2f2fe341c78f6d52636a60ebff>

Dixie Pipeline

Rezoning #19CZ16

Horton Park PUD

Myrtle Wood

Summercrest

FLIPPIN WAY

Colvin Park

Symphony Run

Harmony Glen

Merion

Colby Crossing

Pemberley

BOBBITT RD

PILSLEY RD

BASLOW DR

COLBY CHASE DR

DEZOLA ST

LEVERING MILL RD

SMITH RD

HERNDON LN

PERCUSSION DR

TIMPANI TRL

PONDSIDE DR

SATORI WAY

RHYTHM DR

JESSIE DR

HURDOVER RD

SWEETGUM DR

LITTLEMAN LN

TEN TEN RD

STEPHENSON RD

TECHNOLOGY DR  
E WILLIAMS ST  
155 BYP

## PLANNED UNIT DEVELOPMENT APPLICATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #:	<u>19CZ16</u>	Submittal Date:	<u>7/1/2019</u>
Fee Paid	<u>\$ 4,399.19</u>	Check #	<u>1358 &amp; 1359</u>

## PETITION TO AMEND THE OFFICIAL ZONING DISTRICT MAP

Project Name: \_\_\_\_\_

Address(es): \_\_\_\_\_

PIN(s) \_\_\_\_\_

\_\_\_\_\_ Acreage: \_\_\_\_\_

Current Zoning: \_\_\_\_\_ Proposed Zoning: \_\_\_\_\_

Current 2045 LUM Designation: \_\_\_\_\_

Requested 2045 LUM Designation: \_\_\_\_\_

See next page for LUM amendment

If any portion of the project is shown as mixed use (3 or more stripes on the 2045 Land Use Map) provide the following:

Area classified as mixed use: Acreage: \_\_\_\_\_

Area proposed as non-residential development: Acreage: \_\_\_\_\_

Percent of mixed use area proposed as non-residential: Percent: \_\_\_\_\_

## Applicant Information

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

## Owner Information

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

## Agent Information

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

Other contacts: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



# ATTACHMENT A

Rezoning Application Parcel List  
Horton Park Assembly  
Apex, NC

<u>Parcel</u>	<u>Owner</u>	<u>PIN</u>
1	MFW Investments LLC	0751-42-1387
2	MFW Investments LLC	0751-31-0079 (portion)
3	Horton Park MH, LLC	0751-31-9308 (portion)
4	Mary Elizabeth Horton	0750-39-0993
5	MFWIRA, LLC	0751-40-0194
6	Kimberly Horton; Loomis Horton III	0750-39-8682
7	Kimberly Horton; Loomis Horton III	0750-49-5371
8	MFW Investments LLC	0750-29-9342
9	MFW Investments LLC	0750-28-0998 (portion)
10	MFW Investments LLC	0750-27-0906
11	Kimberly Horton; Loomis Horton III	0750-27-4707
12	MFW Investments LLC	0750-27-8677
13	MFW Investments LLC	0750-27-8925

**CERTIFIED LIST OF NEIGHBORING PROPERTY OWNERS**

Application #: 19CZ16

Submittal Date: 7/1/2019

Provide a certified list of property owners subject to this application and all property owners within 300' of the subject property and HOA Contacts.

	Owner's Name	PIN
1.	See attached sheets	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		

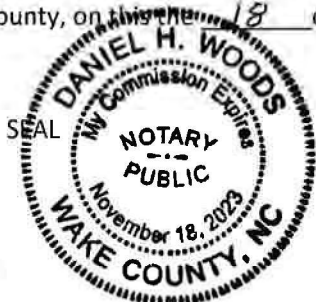
I, Jonathan Edwards, certify that this is an accurate listing of all property owners and property owners within 300' of the subject property.

Date: June 18, 2019

By: *Jonathan Edwards*

COUNTY OF WAKE STATE OF NORTH CAROLINA

Sworn and subscribed before me, DANIEL H. WOODS, a Notary Public for the above State and County, on this the 18 day of JUNE, 2019.



*Daniel H. Woods*  
Notary Public  
DANIEL H. WOODS  
Print Name

My Commission Expires: 11/18/23



TRINITY APEX NORTH 100 LLC  
106 ISLAND VIEW DR  
BEAUFORT NC 28516-9108  
0750085838

PAGE TWO HOLDINGS LLC RODESSA LLC  
940 SE CARY PKWY STE 102  
CARY NC 27518-7417  
0750095624

STEELE, GERTRUDE  
1713A E WILLIAMS ST  
APEX NC 27539-7706  
0750096187

PEMBERLEY PROPERTY OWNERS' ASSOCIATION,  
INC., CHARLESTON MGMT  
PO BOX 97243  
RALEIGH NC 27624-7243  
0750176279

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750184078

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750197426

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750264926

MUSE, EDWARD MUSE, ROBIN  
3305 COLBY CHASE DR  
APEX NC 27539-3602  
0750267955

KUNSMAN, STEVEN A KUNSMAN, SUSAN E  
5408 MERION STATION DR  
APEX NC 27539-3603  
0750269948

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750270906

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750274707

FELTON, TIMOTHY M FELTON, ALLISON C  
3304 COLBY CHASE DR  
APEX NC 27539-3601  
0750278301

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750278677

MFW INVESTMENTS, LLC  
7837 SMITH RD  
APEX NC 27539-8170  
0750278925

FALCHI, JOHN J FALCHI, JOYCE T  
3232 COLBY CHASE DR  
APEX NC 27539-3620  
0750279358

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750280998

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750286271

RICHARDSON, DONALD FELIX  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750288532

RICHARDSON, ALTON RICHARDSON, TERESA  
1295 WINDHAM RD  
GREENVILLE NC 27834-7093  
0750288880

HORTON, MATTHEW  
4 ARBOR LN  
BORDENTOWN NJ 08505-4807  
0750299045

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750299342

YOUNG, TODD C YOUNG, GLORIA C  
3228 COLBY CHASE DR  
APEX NC 27539-3620  
0750370454

DALE, DENNIS DALE, ROBERTA  
3224 COLBY CHASE DR  
APEX NC 27539-3620  
0750371540

HEISE, ROBERT H HEISE, CARY VIVIAN  
2408 MERION CREEK DR  
APEX NC 27539-6300  
0750371996

STEWART, RICHARD J STEWART, MARY A  
3220 COLBY CHASE DR  
APEX NC 27539-3620  
0750372555

CATHEY, ROBERT E III CATHEY, KRISTA B  
3212 COLBY CHASE DR  
APEX NC 27539-3620  
0750373664

RHODES, AMANDA C RHODES, STEVEN A  
3208 COLBY CHASE DR  
APEX NC 27539-3620  
0750375700

PIETZ, BRYAN PIETZ, JORDAN  
2400 MERION CREEK DR  
APEX NC 27539-6300  
0750375774

KANODE, MARK E KANODE, LORI D  
3204 COLBY CHASE DR  
APEX NC 27539-3620  
0750376759

PIETZ, BRYAN S PIETZ, JORDAN  
2400 MERION CREEK DR  
APEX NC 27539-6300  
0750383293

COFFER, LANA HORTON  
3113 CARRIAGE LIGHT CT  
RALEIGH NC 27604-6117  
0750385765

MERION HOMEOWNERS ASSOCIATION INC  
OMEGA ASSOCIATION MANAGEMENT INC  
160 NE MAYNARD RD STE 210  
CARY NC 27513-9676  
0750387004

HORTON, MARY ELIZABETH  
PO BOX 306  
APEX NC 27502-0306  
0750390993

HORTON, CHARLES LEON, SARAH  
8804 STEPHENSON RD  
APEX NC 27539-8170  
0750393222

HINTON, MELISSA D  
5137 DEZOLA ST  
APEX NC 27539-9529  
0750395262

MANSFIELD, MARISA MANSFIELD, MICHAEL  
5133 DEZOLA ST  
APEX NC 27539-9529  
0750398002

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750398682

RYDESKY, THOMAS E RYDESKY, LINDA U  
5232 LEVERING MILL RD  
APEX NC 27539-3610  
0750480767

HORNADA, JEFFREY MICHAEL HORNADA,  
KARA LEIGH  
5228 LEVERING MILL RD  
APEX NC 27539-3610  
0750481855

SURA, PIYUSH SURA, SMITA P  
5229 LEVERING MILL RD  
APEX NC 27539-3640  
0750482535

POZDER, VLADIMIR POZDER, JULI W  
5224 LEVERING MILL RD  
APEX NC 27539-3610  
0750482864

SINGLETARY, MICHAEL SINGLETARY, LAETITIA  
5217 LEVERING MILL RD  
APEX NC 27539-3640  
0750483541

MOUSHEGIAN, KENNITH C MOUSHEGIAN,  
CINDY W  
5220 LEVERING MILL RD  
APEX NC 27539-3610  
0750483860

GREENE, WILLIAM BLAKE GREENE, LAUREN  
KIRBY  
5213 LEVERING MILL RD  
APEX NC 27539-3640  
0750484438

BACHOLZKY, RICHARD JR BACHOLZKY, KATHRYN  
5216 LEVERING MILL RD  
APEX NC 27539-3610  
0750484775

MEHTA, RUSHIKESH J TRUSTEE RUSHIKESH J  
MEHTA REVOCABLE TRUST  
5209 LEVERING MILL RD  
APEX NC 27539-3640  
0750485424

BURNET, MARTHA SNYDER TRUSTEE BURNET,  
GILBERT NEFF TRUSTEE  
5208 LEVERING MILL RD  
APEX NC 27539-3610  
0750485688

RUSNAK, DAVID W RUSNAK, PAMELA P  
5205 LEVERING MILL RD  
APEX NC 27539-3640  
0750486339

MADRID, RICHARD J MADRID, RENE MONIQUE  
5204 LEVERING MILL RD  
APEX NC 27539-3610  
0750487632

KEENE, CHRISTOPHER P KEENE, ANNA E  
5200 LEVERING MILL RD  
APEX NC 27539-3610  
0750488577

HORTON, WILLIAM JR HORTON, EDNA  
8208 SMITH RD  
APEX NC 27539-8176  
0750488737

HORTON, WILLIAM JR  
8208 SMITH RD  
APEX NC 27539-8176  
0750489723

HORTON, WILLIAM JR BURRIS, JULIA HORTON  
8208 SMITH RD  
APEX NC 27539-8176  
0750489886

BECK, JOSHUA KEVIN BECK, KATHERINE  
CLEMMONS  
5129 DEZOLA ST  
APEX NC 27539-9529  
0750492134

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750495371

WRIGHT, DWIGHT MARVIN  
407 S SALEM ST  
APEX NC 27502-2037  
0750498888

HORTON, WILLIAM JR HORTON, EDNA  
8208 SMITH RD  
APEX NC 27539-8176  
0750499041

HORTON, WILLIAM SR HEIRS HORTON,  
LOOMIS JR HEIRS, WILLIAM HORTON JR  
8208 SMITH RD  
APEX NC 27539-8176  
0750499710

HORTON, WILLIAM HORTON, EDNA W  
8208 SMITH RD  
APEX NC 27539-8176  
0750582794

HORTON, WILLIAM JR HORTON, EDNA WILLIS  
8205 SMITH RD  
APEX NC 27539-8177  
0750583990

HORTON, WILLIAM HORTON, EDNA W  
8208 SMITH RD  
APEX NC 27539-8176  
0750591257

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750592361

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750592399

DOWNING, OSWALD DOWNING, DEBORAH H  
8129 SMITH RD  
APEX NC 27539-8175  
0750594097

GANDHI, ANIL R GANDHI, NEHA A  
105 BONNIEWOOD DR  
CARY NC 27518-8961  
0750596206

JACK 1, LLC  
738 CASH ST  
APEX NC 27502-1302  
0751137742

WOMBLE, CHARLES H ET AL WOMBLE, GLEN  
802 BELLAMY RD  
NORTH MYRTLE BEACH SC 29582-2828  
0751201670

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751216689

PRISTINE PARTNERS LLC  
2821 JONES FRANKLIN RD  
RALEIGH NC 27606-4007  
0751222279

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751310079

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751319308

TRINITY APEX NORTH 100 LLC  
106 ISLAND VIEW DR  
BEAUFORT NC 28516-9108  
0751323228

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751328256

MFWIRA, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751400194

KK LAND INC  
2203 GOOD SHEPHERD WAY  
APEX NC 27523-6947  
0751400697

GRIFFIN, SIRRHAN GRIFFIN, JOSEPH A  
1038 IRONGATE DR  
APEX NC 27502-6505  
0751407981

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751414924

HUNTER, MELVIN O HUNTER, NICOLE  
5037 JESSIE DR  
APEX NC 27539-8859  
0751415915

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751421387

HINTON, BLANCHE W  
4929 JESSIE DR  
APEX NC 27539-9302  
0751424433

TOOMER, JOE ELLIS TOOMER, FANNIE O  
PO BOX 676  
APEX NC 27502-0676  
0751426099

INDUS REAL ASSOC LLC  
4713 BROOK TOP CT  
RALEIGH NC 27606-3100  
0751426828

KK LAND INC  
2203 GOOD SHEPHERD WAY  
APEX NC 27523-6947  
0751510857

CAREY C JONES MEMORIAL PARK INC  
PO BOX 781  
APEX NC 27502-0781  
0751532815

Additional properties on Sweetgum Drive have been added for informational purposes

## DEVELOPMENT NAME APPROVAL APPLICATION

Application #: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

Fee for Initial Submittal: No Charge

Fee for Name Change after Approval: \$500\*

### Purpose

To provide a consistent and clearly stated procedure for the naming of subdivisions and/or developments and entrance roadways (in conjunction with *Town of Apex Address Policy*) so as to allow developers to define and associate the theme or aesthetics of their project(s) while maintaining the Town's commitment to preserving the quality of life and safety for all residents of Apex proper and extraterritorial jurisdiction.

### Guidelines

- ✓ The subdivision/development name shall not duplicate, resemble, or present confusion with an existing subdivision/development within Apex corporate limits or extraterritorial jurisdiction except for the extension of an existing subdivision/development of similar or same name that shares a continuous roadway.
- ✓ The subdivision/development name shall not resemble an existing street name within Apex corporate limits or extraterritorial jurisdiction unless the roadway is a part of the subdivision/development or provides access to the main entrance.
- ✓ The entrance roadway of a proposed subdivision/development shall contain the name of the subdivision/development where this name does not conflict with the Town of Apex *Road Name Approval Application* and *Town of Apex Address Policy* guidelines.
- ✓ The name "Apex" shall be excluded from any new subdivision/development name.
- ✓ Descriptive words that are commonly used by existing developments will be scrutinized more seriously in order to limit confusion and encourage distinctiveness. A list of commonly used descriptive words in Apex's jurisdiction is found below.
- ✓ The proposed subdivision/development name must be requested, reviewed and approved during preliminary review by the Town.
- ✓ A \$500.00 fee will be assessed to the developer if a subdivision/development name change is requested after official submittal of the project to the Town.\*

\*The imposed fee offsets the cost of administrative changes required to alleviate any confusion for the applicant, Planning staff, other Town departments, decision-making bodies, concerned utility companies and other interested parties. There is no charge for the initial name submittal.

### Existing Development Titles, Recurring

	Residential	Non-Residential
10 or more	Creek, Farm(s), Village(s),	Center/Centre
6 to 9	Crossing(s), Park, Ridge, Wood(s)	Commons, Park
3 to 5	Acres, Estates, Glen(s), Green*, Hills	Crossing(s), Plaza, Station, Village(s)

\*excludes names with Green Level

**DEVELOPMENT NAME APPROVAL APPLICATION**

Application #: 19CZ16

Submittal Date: 7/1/2019

**Proposed Subdivision/Development Information**

Description of location: Properties located between Jessie Drive and Colby Chase Drive

Nearest intersecting roads: \_\_\_\_\_

Wake County PIN(s): See Attachment A

Township: White Oak

**Contact Information (as appropriate)**

Contact person: Peak Engineering & Design (Jeff Roach)

Phone number: (919) 439-0100

Fax number: (919) 439-6411

Address: 1125 Apex Peakway, Apex, NC 27502

E-mail address: jroach@peakengineerin.com

Owner: Michael F. Whitehead

Phone number: (919) 801-3905

Fax number: \_\_\_\_\_

Address: 114 Birklands Drive, Cary, NC 27518

E-mail address: mwhitehead@macgregordev.com

**Proposed Subdivision/Development Name**

1<sup>st</sup> Choice: Horton Park

2<sup>nd</sup> Choice (Optional): \_\_\_\_\_

**Town of Apex Staff Approval:**

\_\_\_\_\_  
Town of Apex Planning Department Staff

\_\_\_\_\_  
Date

**TOWN OF APEX UTILITIES OFFER AND AGREEMENT**

Application #: 19CZ16

Submittal Date: 7/1/2019

**Town of Apex  
73 Hunter Street  
P.O. Box 250 Apex, NC 27502  
919-249-3400**

**WAKE COUNTY, NORTH CAROLINA CUSTOMER SELECTION AGREEMENT**

Horton Park  
\_\_\_\_\_  
\_\_\_\_\_  
(the "Premises")

The Town of Apex offers to provide you with electric utilities on the terms described in this Offer & Agreement. If you accept the Town's offer, please fill in the blanks on this form and sign and we will have an Agreement once signed by the Town.

\_\_\_\_\_, the undersigned customer ("Customer") hereby irrevocably chooses and selects the Town of Apex (the "Town") as the permanent electric supplier for the Premises. Permanent service to the Premises will be preceded by temporary service if needed.

The sale, delivery, and use of electric power by Customer at the Premises shall be subject to, and in accordance with, all the terms and conditions of the Town's service regulations, policies, procedures and the Code of Ordinances of the Town.

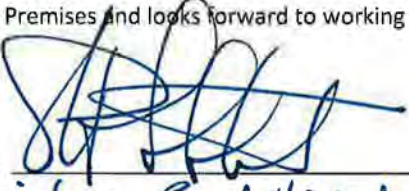
Customer understands that the Town, based upon this Agreement, will take action and expend funds to provide the requested service. By signing this Agreement the undersigned signifies that he or she has the authority to select the electric service provider, for both permanent and temporary power, for the Premises identified above.

Any additional terms and conditions to this Agreement are attached as Appendix 1. If no appendix is attached this Agreement constitutes the entire agreement of the parties.

Acceptance of this Agreement by the Town constitutes a binding contract to purchase and sell electric power.

Please note that under North Carolina General Statute §160A-332, you may be entitled to choose another electric supplier for the Premises.

Upon acceptance of this Agreement, the Town of Apex Electric Utilities Division will be pleased to provide electric service to the Premises and looks forward to working with you and the owner(s).

ACCEPTED: 

CUSTOMER: \_\_\_\_\_  
BY: Michael F. Whitehead  
Authorized Agent

TOWN OF APEX  
BY: \_\_\_\_\_  
Authorized Agent

DATE: 6/28/2019

DATE: \_\_\_\_\_



**AGENT AUTHORIZATION FORM**

Application #: 19CZ16

Submittal Date: 7/1/2019

MFW Investments, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 5100 Jessie Drive, Apex, NC, PIN 0751-42-1387

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)

Michael G. Whitehead

Type or print name

6/28/2019

Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: 19CZ16 Submittal Date: 7/1/2019

Horton Park MF LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 5101 Jessie Drive, Apex, NC PIN 0751-31-9308

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex, NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)



Thomas G. Drake  
Member / Manager  
Horton Park MF LLC

Type or print name

6/24/19

Date

Type or print name

Date

Type or print name

Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: 19CZ16 Submittal Date: 7/1/2019

MFW Investments, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 5220 Jessie Drive, Apex, NC, PIN 0751-31-0079

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)



Michael F. Whitehead

Type or print name

6/28/2019

Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: 19CZ16 Submittal Date: 7/1/2019

Mary Elizabeth Horton is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 0 Dezola Street, Apex, NC, PIN 0750-39-0993

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)

Mary Elizabeth Horton  
Mary Elizabeth Horton  
Type or print name

June 28, 2019  
Date

\_\_\_\_\_  
Type or print name Date

\_\_\_\_\_  
Type or print name Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

# AGENT AUTHORIZATION FORM

Application #: 19CZ16

Submittal Date: 7/1/2019

MFWIRA, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 0 Dezola Street, Apex, NC, PIN 0751-40-0194

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)  
  
Michael F. Whitehead 6/28/2019  
Type or print name Date

\_\_\_\_\_  
Type or print name Date

\_\_\_\_\_  
Type or print name Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

AGENT AUTHORIZATION FORM

Application #: 19CZ16

Submittal Date: 7/1/2019

Kimberly Horton and Loomis A Horton III is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 0 Dezola Street, Apex, NC, PIN 0750-39-8682 0750-27-4707, 0750-49-5371

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

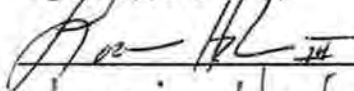
Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502


Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)

  
Loomis Horton III  
 Type or print name

6/28/19  
 Date

  
Kimberly Horton  
 Type or print name

6/28/19  
 Date

\_\_\_\_\_  
 Type or print name

\_\_\_\_\_  
 Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: 19CZ16 Submittal Date: 7/1/2019

Merion Investment Properties LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 0 Dezola Street, Apex, NC, PIN 0750-29-9342

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s) 

Michael R. Whitehead  
Type or print name

6/28/2019  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: 19CZ16

Submittal Date: 7/1/2019

MFW Investments, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 8140 Smith Road, Apex, NC, PIN 0750-28-0998

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

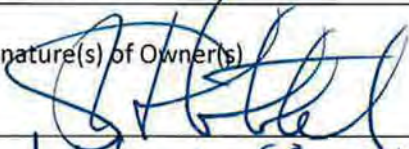
Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)



Michael F. Whitehead

Type or print name

6/28/2019

Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**



**AGENT AUTHORIZATION FORM**

Application #: 19CZ16

Submittal Date: 7/1/2019

Merion Investments Properties, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 0 Dezola, Apex, NC, PIN 0750-27-8677

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)



Michael F. Whitehead

Type or print name

6/28/2019

Date

\_\_\_\_\_

Type or print name

\_\_\_\_\_

Date

\_\_\_\_\_

Type or print name

\_\_\_\_\_

Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

# AGENT AUTHORIZATION FORM

Application #: 19CZ16 Submittal Date: 7/1/2019

MFW Investments, LLC is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 8252 Smith Road, Apex, NC, PIN 0750-27-8925

The agent for this project is: Peak Engineering & Design

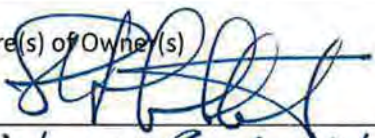
I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s) 

Michael G. Whitehead  
Type or print name

6/28/2019  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

\_\_\_\_\_  
Type or print name

\_\_\_\_\_  
Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**



# Instruction Packet and Affidavit for Neighborhood Meetings

Town of Apex  
Planning Department  
PO Box 250  
Apex, NC 27502

T: 919-249-3426  
F: 919-249-3338

This packet consists of instructions and templates for conducting a required Neighborhood Meeting. Planning Department staff are available to advise you in the preparation of these materials. Call the Planning Department at (919) 249-3426 for more information.

## WHAT IS THE PURPOSE OF A NEIGHBORHOOD MEETING?

A neighborhood meeting is a required form of community outreach to receive initial feedback regarding certain project types prior to submittal to the Planning Department per the standards found in UDO Sec. 2.2.7. The intention of the meeting is to initiate neighbor communication and identify issues and concerns early on and provide the applicant an opportunity to address neighbor concerns about the potential impacts of the project prior to submitting an application. A neighborhood meeting is valid for six (6) months prior to the submission of an application; a delay in submission requires a new neighborhood meeting.

## WHEN IS A NEIGHBORHOOD MEETING REQUIRED?

- Rezoning (including Planned Unit Developments);
- Major Site Plans;
- Master Subdivision Plan (excluding minor or exempt subdivisions); or
- Special Use Permits

## INSTRUCTIONS

Prior to submitting a Rezoning, Major Site Plan, Master Subdivision Plan (excluding minor or exempt subdivisions), or Special Use Permits, the applicant must conduct at least one (1) Neighborhood Meeting. The applicant shall submit all forms included in this packet with their initial submittal.

The Neighborhood Meeting must be held in accordance with the following rules:

### These groups and individuals must be invited to the meeting:

- The applicant is required to notify the Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the neighborhood meeting, not including the day of mailing. The applicant shall use their own return address on the envelopes as the meeting is a private meeting between the applicant and the neighbors.
- The applicant shall include with the meeting notice a vicinity map in addition to either the existing zoning map of the area or preliminary plans of the proposed development (see Handout requirements below).

**The meeting must be held within specific timeframes and meet certain requirements:**

- The meeting must be held for a minimum of two (2) hours, Monday through Thursday, during the 5:00 p.m. - 9:00 p.m. time period. The meeting cannot be held on a Town recognized holiday (which coincide with the State of North Carolina recognized holidays).
- The meeting shall be held at a place that is generally accessible to neighbors that reside in close proximity to the land subject to the application.
- A sign-in sheet must be used in order to verify attendance. Ensure each attendee signs in. Please note if any person(s) refuses to sign in. Note if no one attended.
- Handout requirements:
  - For rezonings (excluding rezonings to PUD-CZ, TND-CZ and MEC-CZ), a vicinity map and existing zoning map of the area must be provided to help facilitate discussion.
  - For rezonings to PUD-CZ, TND-CZ and MEC-CZ; Major Site Plans; Master Subdivision Plans; and Special Use Permits, preliminary plans of the proposed development must be available at the meeting to help facilitate discussion. Neighbors may request emailed/mailed copies of the maps or plans from the applicant by checking the “send plans” box on the sign-in sheet, and the applicant shall provide reduced copies upon such request.
  - Printed copies must equal the number of notices required to be sent.
  - Contact information for the applicant’s representative must be provided on the handout.
  - A copy of the handout must be included as part of the Neighborhood Meeting report.
- The agenda of the meeting shall include:
  - Explanation of all processes the meeting is being held for (rezoning, subdivision, etc.).
  - Explanation of future meetings (additional neighborhood meetings, Planning Board, Town Council, etc.).
  - Explanation of development proposal – uses and conditions for rezonings, layout for subdivision and site plans, and builder/end user if known/public knowledge.
- Questions or concerns by attendees, and responses by the applicant, if any, must be noted. Provide blank comment sheets or notecards for neighbors to submit written comments. The applicant shall also include any questions and concerns received via written correspondence (such as email) or phone call along with responses provided by the applicant.
- The applicant shall be responsible for notifying any neighbors who check the “Send Plans & Updates” box on the sign-in sheet of any additional neighborhood meetings and the actual submittal date to the Town with a link to the Town of Apex’s Interactive Development Map.

**For accountability purposes, please submit the following with your application:**

- A copy of the letter mailed to neighbors and neighborhood organizations (use attached invitation template);
- A list of those persons and neighborhood organizations invited to the meeting;
- A copy of the sign-in sheet (use attached sign-in sheet template);
- A summary of the meeting and a list of any changes made to the project as a result of the neighborhood comments (use attached meeting summary template);
- The affidavit, signed, dated, and notarized (use attached affidavit template); and
- One reduced copy of the maps and/or plans presented to the neighbors at the Neighborhood Meeting.



June 12, 2019

Adjacent Property Owners and Interested Parties,

RE: Horton Park Rezoning

During the design and review of Horton Park, the timing of NCDOT and Town of Apex projects are beginning to align with the Horton Park timing. For this reason, Horton Park will be submitting a rezoning on July 1st, 2019 to adjust the timing of off-site roadway improvements with three (3) major transportation improvements in mind.

1. Ten Ten Road improvements
2. Highway 55 design and future improvements
3. Jessie Drive design and future improvements/extension

The project will continue to have a mix of residential options (single family, townhomes, and apartments) and non-residential property along the future Jessie Drive corridor. This letter is to inform you that a neighborhood meeting has been scheduled to introduce the rezoning request, the overall Master Subdivision Plan and to answer any questions which you may have. You are welcome to attend the meeting, email me any questions, or call our office to discuss the project.

Meeting Information:

- Date of Neighborhood Meeting: June 27, 2019
- Meeting location: 237 N. Salem Street, Apex, NC 27502 (Halle Cultural Arts Center)
- Time of Meeting: 5:30 PM

If you have any questions concerning the rezoning request, do not hesitate to call or email me at ([jroach@peakengineering.com](mailto:jroach@peakengineering.com)).

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffret A. Roach".

Jeffret A Roach P.E.  
Peak Engineering & Design, PLLC

# NOTICE OF NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town’s website or disclosed to third parties.

June 12, 2019

Date

Dear Neighbor:

You are invited to a neighborhood meeting to review and discuss the development proposal at  
 See Attached Sheet See Attached Sheet

Address(es)

PIN(s)

in accordance with the Town of Apex Neighborhood Meeting procedures. The Neighborhood Meeting is intended as a way for the applicant to discuss the project and review the proposed plans with adjacent neighbors and neighborhood organizations before the submittal of an application to the Town. This provides neighbors an opportunity to raise questions and discuss any concerns about the impacts of the project before it is officially submitted. Once an application has been submitted to the Town, it may be tracked using the [Interactive Development Map](#) or the [Apex Development Report](#) located on the Town of Apex website at [www.apexnc.org](http://www.apexnc.org).

A Neighborhood Meeting is required because this project includes (check all that apply):

- Rezoning (including Planned Unit Development);
- Major Site Plan;
- Master Subdivision Plan (excludes minor or exempt subdivision); or
- Special Use Permit

The following is a description of the proposal (also see attached map(s) and/or plan sheet(s)):

To discuss with the adjacent property owners and other interested parties the rezoning request to adjust the phasing of the project, timing of roadway improvements, the rezoning process, and the overall Master Subdivision Plan.

Estimated submittal date: July 1, 2019

### MEETING INFORMATION:

Property Owner(s) name(s):	See Attached
Applicant(s):	Peak Engineering & Design (Jeff Roach); MFW Investments, LLC
Contact information (email/phone):	(919) 439-0100, jroach@peakengineering.com
Meeting Address:	237 N. Salem Street, Apex, NC 27502 (Halle Cultural Arts Center)
Date of meeting*:	June 27, 2019
Time of meeting*:	5:30 -

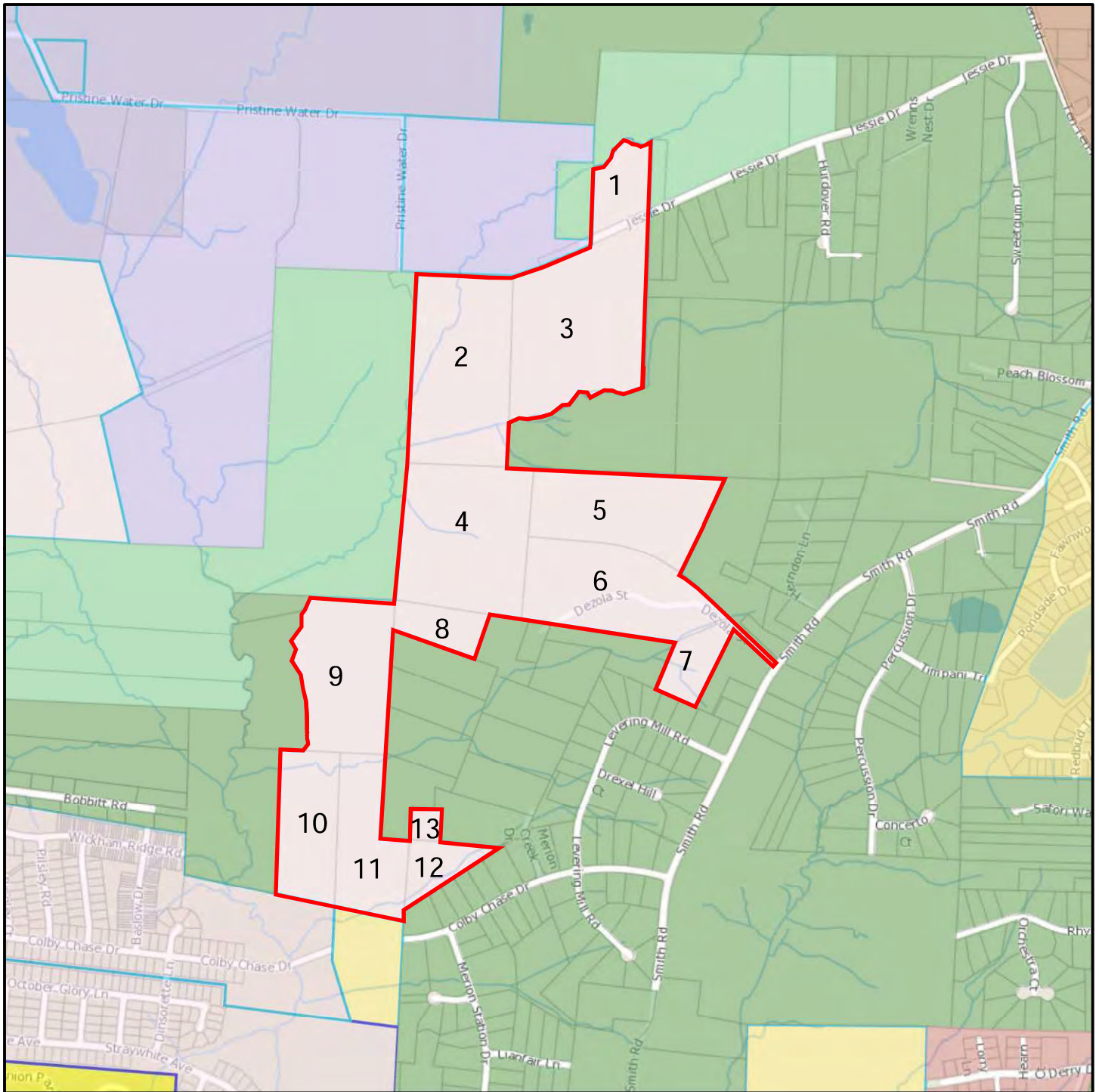
### MEETING AGENDA TIMES:

Welcome:	5:30 - 5:40
Project Presentation:	5:40 - 6:00
Question & Answer:	6:00 -

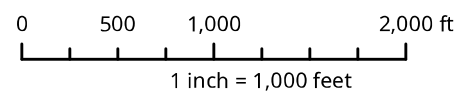
\*Meetings shall occur between 5:00 p.m. - 9:00 p.m. on a Monday through Thursday (excluding Town recognized holidays). If you have questions about the general process for this application, please contact the Planning Department at 919-249-3426. You may also find information about the Apex Planning Department and on-going planning efforts at <http://www.apexnc.org/180/Planning>.

Rezoning Application Parcel List  
Horton Park Assembly  
Apex, NC

<u>Parcel</u>	<u>Owner</u>	<u>PIN</u>
1	MFW Investments LLC	0751-42-1387
2	MFW Investments LLC	0751-31-0079
3	Horton Park MF, LLC	0751-31-9308
4	Mary Elizabeth Horton	0750-39-0993
5	MFWIRA, LLC	0751-40-0194
6	Kimberly Horton; Loomis Horton III	0750-39-8682
7	Kimberly Horton; Loomis Horton III	0750-49-5371
8	MFW Investments LLC	0750-29-9342
9	MFW Investments LLC	0750-28-0998
10	MFW Investments LLC	0750-27-0906
11	Kimberly Horton; Loomis Horton III	0750-27-4707
12	MFW Investments LLC	0750-27-8677
13	MFW Investments LLC	0750-27-8925



## Horton Park Rezoning



***Disclaimer***

*iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied, are provided for the data therein, its use, or its interpretation.*



# PROJECT CONTACT INFORMATION

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

## Development Contacts:

Project Name: MFW Investments, LLC  
 Location: Properties located between Jessie Drive and Colby Chase Drive  
 Property PIN: See Attached sheet Acreage/Square Feet: \_\_\_\_\_  
 Zoning: PUD - CZ Subdivision/Development: \_\_\_\_\_

Property Owner: See Attached Sheet  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Developer: MFW Investments, LLC  
 Address: 114 Birklands Drive  
 City: Cary State: NC Zip: 27518  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: mwhitehead@macgregordev.com

Engineer: Peak Engineering & Design, PLLC (Jeff Roach, P.E.)  
 Address: 1125 Apex Peakway  
 City: Apex State: NC Zip: 27502  
 Phone: (919) 439-0100 Fax: (919) 439-6411 Email: jroach@peakengineerindesign.com

Builder (if known): \_\_\_\_\_  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

## Town of Apex Department Contacts

Planning Department Main Number (Provide development name to be routed to correct planner)	(919) 249-3426
Parks, Recreation & Cultural Resources Department Angela Reincke, Parks Planner	(919) 249-7468
Public Works - Transportation Russell Dalton, Senior Transportation Engineer	(919) 249-3358
Water Resources Department Mike Deaton, Stormwater & Utility Engineering Manager Stan Fortier, Senior Engineer (Sedimentation & Erosion Control)	(919) 249-3413 (919) 249-1166
Electric Utilities Division Rodney Smith, Electric Technical Services Manager	(919) 249-3342

# COMMON CONSTRUCTION ISSUES & WHO TO CALL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

<b>Noise &amp; Hours of Construction:</b>	<b>Non-Emergency Police</b>	<b>919-362-8661</b>
Noise from tree removal, grading, excavating, paving, and building structures is a routine part of the construction process. The Town generally limits construction hours to 7 a.m. – 8:30 p.m. so that there are quiet times even during the construction process. Note that construction outside of these hours is allowed with special permission from the Town when it makes more sense to have the construction occur at night, often to avoid traffic issues. In addition, the Town limits hours of blasting rock to Monday through Friday from 8:00 a.m. to 5:00 p.m. Report violations of construction hours and other noise complaints to the Non-Emergency Police phone number at 919-362-8661.		
<b>Construction Traffic:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
Construction truck traffic will be heavy throughout the development process, including but not limited to removal of trees from site, loads of dirt coming in and/or out of the site, construction materials such as brick and wood brought to the site, asphalt and concrete trucks come in to pave, etc. The Town requires a construction entrance that is graveled to try to prevent as much dirt from leaving the site as possible. If dirt does get into the road, the Town can require they clean the street (see "Dirt in the Road" below).		
<b>Road Damage &amp; Traffic Control:</b>	<b>Water Resources – Infrastructure Inspections</b>	<b>919-362-8166</b>
There can be issues with roadway damage, roadway improvements, and traffic control. Potholes, rutting, inadequate lanes/signing/stripping, poor traffic control, blocked sidewalks/paths are all common issues that should be reported to Water Resources – Infrastructure Inspections at 919-249-3427. The Town will get NCDOT involved if needed.		
<b>Parking Violations:</b>	<b>Non-Emergency Police</b>	<b>919-362-8661</b>
Unless a neighbor gives permission, there should be no construction parking in neighbors' driveways or on their property. Note that parking in the right-of-way is allowed, but Town regulations prohibit parking within 15 feet of driveways so as not to block sight triangles. Trespassing and parking complaints should be reported to the Non-Emergency Police phone number at 919-362-8661.		
<b>Dirt in the Road:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
Sediment (dirt) and mud gets into the existing roads due to rain events and/or vehicle traffic. These incidents should be reported to Stan Fortier. He will coordinate the cleaning of the roadways with the developer.		
<b>Dirt on Properties or in Streams:</b>	<b>Stan Fortier</b> <b>Danny Smith</b>	<b>919-249-1166</b> <b><a href="mailto:Danny.Smith@ncdenr.gov">Danny.Smith@ncdenr.gov</a></b>
Sediment (dirt) can leave the site and get onto adjacent properties or into streams and stream buffers; it is typically transported off-site by rain events. These incidents should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the appropriate repairs with the developer. Impacts to the streams and stream buffers should also be reported to Danny Smith ( <a href="mailto:danny.smith@ncdenr.gov">danny.smith@ncdenr.gov</a> ) with the State.		
<b>Dust:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
During dry weather dust often becomes a problem blowing into existing neighborhoods or roadways. These incidents should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the use of water trucks onsite with the grading contractor to help control the dust.		
<b>Trash:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
Excessive garbage and construction debris can blow around on a site or even off of the site. These incidents should be reported to Stan Fortier at 919-249-1166. He will coordinate the cleanup and trash collection with the developer/home builder.		
<b>Temporary Sediment Basins:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
Temporary sediment basins during construction (prior to the conversion to the final stormwater pond) are often quite unattractive. Concerns should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the cleaning and/or mowing of the slopes and bottom of the pond with the developer.		
<b>Stormwater Control Measures:</b>	<b>Mike Deaton</b>	<b>919-249-3413</b>
Post-construction concerns related to Stormwater Control Measures (typically a stormwater pond) such as conversion and long-term maintenance should be reported to Mike Deaton at 919-249-3413.		
<b>Electric Utility Installation:</b>	<b>Rodney Smith</b>	<b>919-249-3342</b>
Concerns with electric utility installation can be addressed by the Apex Electric Utilities Department. Contact Rodney Smith at 919-249-3342.		

# NEIGHBORHOOD MEETING SIGN-IN SHEET

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Meeting Address: Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room)

Date of meeting: June 27, 2019 Time of meeting: 5:30

Property Owner(s) name(s): See Attached Sheet

Applicant(s): MFW Investments, LLC

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Falchi	3232 Colby Chase	[REDACTED]	[REDACTED]	[REDACTED] gmail.com
2.	Jam Carter	2614 Sweetgum Dr	[REDACTED]	[REDACTED]	[REDACTED] ✓
3.	ERMA BURR	2625 Sweetgum DR	[REDACTED]	[REDACTED]	[REDACTED] ✓
4.	Donna Provance	2624 " "	[REDACTED]	[REDACTED]	[REDACTED] ✓
5.	Brian Johnson	3305 Cheswald Ct	[REDACTED]	[REDACTED]	[REDACTED] ✓
6.	JLOSS WITARS	111 ANNANDALE	[REDACTED]	[REDACTED]	[REDACTED] ✓
7.	MIKE Mansfield	5133 Dezelast	[REDACTED]	[REDACTED]	[REDACTED] ✓
8.	Judy Ward	2528 Sweetgum	[REDACTED]	[REDACTED]	[REDACTED] ✓
9.	Karen Peters	5300 Leveing Kill Rd	[REDACTED]	[REDACTED]	[REDACTED] ✓
10.	Margaret Griffin	2609 Sweetgum Dr.	[REDACTED]	[REDACTED]	[REDACTED] ✓
11.	Neilvin Hunter	5037 Jessie Dr	[REDACTED]	[REDACTED]	[REDACTED] ✓
12.	Steven Rhodes	3208 Colby Chase	[REDACTED]	[REDACTED]	[REDACTED] ✓
13.	Alton Richardson	1295 Windham Pl Greenville	[REDACTED]	[REDACTED]	[REDACTED] net ✓
14.					

Use additional sheets, if necessary.

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Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Buckel Bullock	2521 Sweetgum Dr. <sup>Apex</sup>	[REDACTED]	[REDACTED]	✓
2.	Randy Mann	106 Island View Dr. <sup>RESURFACED</sup>			✓
3.	Jerilyn Paderno	3216 Winton Ln			✓
4.	Russ & Laurie Bell	5508 Merion Station Dr.			✓
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Use additional sheets, if necessary.

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Applicant(s): MFW Investments, LLC

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Joyce Falchi	3232 Colby Chase Dr			x
2.	Pam Carter	2616 Sweetgum Dr			x
3.	Erma Burr	2625 Sweetgum Dr			x
4.	Donna Provance	2624 Sweetgum Dr			x
5.	Brian Johnson	3305 Chaswold Ct			x
6.	Moss Withers	111 Annadale Dr			x
7.	Mike Mansfield	5133 Dezola St			x
8.	Judy Ward	2828 Sweetgum Dr			x
9.	Karen Peters	5300 Levering Mill Rd			x
10.	Marcaret Griffin	2609 Sweetgum Dr			x
11.	Melvin O Hunter	5037 Jessie Dr			x
12.	Steven Rhodes	3208 Colby Chase Dr			x
13.	Alton Richardson	1295 Windham Pl Greenville NC			x
14.					

Use additional sheets, if necessary.

# NEIGHBORHOOD MEETING SIGN-IN SHEET

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Date of meeting: June 27, 2019 Time of meeting: 5:30

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Applicant(s): MFW Investments, LLC

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Bethel Bullock	2521 Sweetgum Dr			X
2.	Randy Mann	106 Island View Dr Beaufort NC			X
3.	Jerilyn Paolino	3216 Lianfair Ln			X
4.	Russ/Laurie Bell	5508 Merian Station Dr			X
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Use additional sheets, if necessary.

# SUMMARY OF DISCUSSION FROM THE NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Property Owner(s) name(s): See Attached Sheet  
Applicant(s): MFW Investments, LLC  
Contact information (email/phone): Jeff Roach, jroach@peakengineering.com  
Meeting Address: Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room)  
Date of meeting: 6-27-2019 Time of meeting: 5:30 -

Please summarize the questions/comments and your response from the Neighborhood Meeting in the spaces below (attach additional sheets, if necessary). Please state if/how the project has been modified in response to any concerns. The response should not be "Noted" or "No Response". There has to be documentation of what consideration the neighbor's concern was given and justification for why no change was deemed warranted.

Question/Concern #1:

SEE ATTACHED LIST OF QUESTIONS AND RESPONSES

Applicant's Response:

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Question/Concern #2:

Applicant's Response:

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Question/Concern #3:

Applicant's Response:

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Question/Concern #4:

Applicant's Response:

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The Horton Park rezoning and Master Subdivision neighborhood meeting started at 5:30 pm with a brief introduction of the project, the location, and general housekeeping items including the sign-in sheets and handouts. This was followed up by a discussion related to what zoning and Master Subdivision Plans are, the timing of the project, and what our role is for the project. This led into the presentation of the proposed Zoning (10 minutes) followed by discussions related to the Master Subdivision Plan (10 minutes).

The floor was then opened to a discussion with questions and answers from the group. Following are the questions and a summary of responses (some of the questions and responses were long-winded, were condensed for clarity/space, or combined with other questions to provide clarity to staff):

1. Why is the project back again? Please clarify the changes again.
  - A. Horton Park is being rezoned for three (3) reasons: (1) modify the conditions and timing associated with off-site roadway improvements; (2) incorporate timing of Phase I and Phase II development with Jessie Drive construction and alignment of the north-south collector street; and (3) removing the “Cash” property from the PUD and zoning it TF-CZ.  
The Town of Apex is proposing to design and build Jessie Drive – and the zoning of Horton Park requires the adjustment of a number of zoning conditions to allow the project to start without having Jessie Drive either in place or under construction. The Town’s investment in Jessie Drive as a Major Thoroughfare is something that has been in discussions for a couple years – and Apex sees the benefit of the connection for neighbors, commuters, and life safety personnel.
2. The Sweetgum neighbors were invited to the meeting – is the zoning changing to incorporate more property near Sweetgum Drive?
  - A. No, there is no additional property being added. The property owners on Sweetgum were notified based upon their interest in the original zonings over the past 2-1/2 years.
3. Are there any changes to the design of Jessie Drive @ Ten Ten which would impact the Sweetgum property owners?
  - A. The Town is beginning the design of Jessie Drive @ Ten Ten in the next fiscal year. We are not aware of the final design at this time. Directed the property owners the Town’s website and the Interactive Development Map for upcoming projects – but not sure if Jessie Drive extension would be included until design-permitting was started.
4. Is a traffic signal proposed at Jessie Drive at Ten Ten Road?
  - A. Horton Park Phase I is not proposing to construct Jessie Drive or have any traffic directed to Jessie Drive. The Horton Park study will not evaluate Jessie Drive for a traffic signal. The Town of Apex extension of Jessie Drive “should” evaluate the intersection for the installation of a new signal. That is part of the ongoing discussions with Apex Transportation Staff related to the Jessie Drive extension project.
5. What is the timing of Jessie Drive?
  - A. Per staff discussions, the 2019-2020 budget allocated \$1MM for design and studies of the Jessie Drive corridor. 2021-2022 budget allocates \$10MM for the construction of Jessie Drive from Highway 55 to Ten Ten. This is still up for discussions with the Town of Apex but is the current status of the project.
6. How does the Jessie Drive timing align with the other projects in the area?
  - A. Explained the current schedule for Ten Ten (start in 2023); Highway 55 (unknown at this time); and Jessie Drive (budget \$10mm for 2022 start). This will be reviewed annually to coordinate with NCDOT and other grants or alternate funding sources as soon as possible (per discussions with staff).



7. What is the plan for the barricade at Colby Crossing and the Merion Subdivision?
  - A. Horton Park continues to have the zoning condition to install the barriers on the western edge of Merion on Colby Chase Drive until the Town of Apex determines the connection is needed. No change to this condition worked out with Merion HOA during the previous zoning requests.
8. Are there other conditions which are changing?
  - A. We assured the neighbors that the rezoning is about timing of improvements – not about modification of any of the conditions which were worked on for months through two previous rezonings.
9. What is the Middle Creek pump station? What is a pump station? And where is it located?
  - A. The Middle Creek Regional Pump Station (aka Middle Creek north) is a pump station that is required to pump sewage from Horton Park and other upstream properties to the Town's Water Reclamation Facility on Pristine Water Drive. This pump station is approximately \$4MM in costs for the developer of Horton Park. The pump station is currently planned for the northeastern corner of the intersection of Middle Creek and Colby Chase Drive (same location that it has been in since the initial zoning and Master Subdivision Plan).
10. What do you mean by staff? Are you referring to Planning Department?
  - A. Planning, Engineering, Transportation, Public Works, Fire, and Building Inspections. These are the staff groups which attend the pre-application meetings and we work with on every project.
11. What does minor collector mean?
  - A. A minor collector is a street designation which specifies the street should expect more vehicles than neighborhood streets, have a slightly higher speed (possibly), and act as a funnel to the larger streets (larger streets being Major Collectors, Thoroughfares, and Interstates).
12. Is the Town of Apex proposing to take ownership of Jessie Drive after completion of the extension?
  - A. That is unknown at this time. Current plan is for Jessie Drive to be constructed to Town of Apex standard but retained within the NCDOT maintenance system. That will be determined later.
13. In showing the 2045 Land Use Map, can you explain the different colors and what they mean?
  - A. Went into the definition of medium density (light yellow), medium-high density (light orange), high density (dark orange), light blue (office employment), purple (industrial employment), and green (park). Then explained the difference between the existing ZONING MAP, 2045 LAND USE MAP, and the WAKE GIS.
14. What is the RCA? And where is it proposed?
  - A. Resource Conservation Area (RCA) is the preservation of existing vegetation and environmentally sensitive areas including trees, wetlands, floodplains, steep slopes, and animal habitat. RCA is proposed to be around the property in various locations including those listed above (current MSP was used to identify current RCA locations).
15. How many lots are proposed with the project?
  - A. The number of lots from the original zoning has not changed. In general, approximately 350 single family or townhomes plus the apartment area and Tech-Flex area along Jessie Drive.
16. What is Tech-Flex? And what are the uses permitted?
  - A. Tech-Flex is an office or business zoning with a number of uses. The uses have been limited for this project to included (as an example) day care, vet, entertainment area (indoor or outdoor), restaurants, offices, convenience store, grocery store, repair services, and others. All the uses will be identified in the zoning application on Interactive Development Map once submitted to the Town.

17. What is the development timing?

A. **Phase I** is the residential portion south of the existing landfill and “N/F Cash Property” which has access to Smith Road and Colby Chase Drive – the property was identified on the maps at the meeting. This section is hoped to be approved in early 2020; construction start in Spring of 2020; full construction build-out of homes in 2024-2025. This timing is based upon the success of the project and any financial changes. **Phase II** of the project is the section along Jessie Drive including PODs 2,3 and 4 which all rely upon Jessie Drive for access – this timing is based upon the timing of Jessie Drive, Ten Ten, and Highway 55 projects.

18. What is the timing of the review by Apex and the Town Council meetings?

A. Submittal of the rezoning request is July 1, 2019. This will start a 3-4 month process prior to Town Council public hearings. Assuming approval of the zoning, the Master Subdivision Plan (which has previously been approved) will be modified to reflect the changes associated with the rezoning. Construction Documents will then follow for the contractor and permitting. Apex will send out a notification of future Public Hearings based upon the list of contacts we provided (including the Sweetgum Drive property owners).

19. What is the plan for the greenway and connection to surrounding properties?

A. The Middle Creek Greenway was discussed at length. Middle Creek Greenway is major connection from the Town of Apex to Holly Springs’ greenway system. These projects include Middle Creek Phase I and II (Town of Apex projects), Reunion Pointe, Horton Park, and future projects north of Jessie Drive. Future connection to Lufkin Road and the Town of Cary greenway system in Regency Park.

20. Who will the builder be?

A. The construction team may be a couple of builders. Final builder team is TBD.

21. In summary, what is the meeting for?

A. This meeting is to explain the process, the project, and product while gathering information from residents in the area. The questions will be gathered, answers provided, and included in the zoning submittal for Planning Board and Town Council review during the zoning process. Changes to the design documents or the zoning application may be made from comments received.

22. Who can I contact about the project? Town of Apex?

A. A list of Town of Apex contacts were provided at the meeting. Staff will know about the project but will not know details until after the July 1, 2019 zoning submittal.

23. Who approves the revised rezoning request?

A. Town Council reviews and ultimately provides final zoning determination.

24. Where can I find the rezoning application once it is submitted?

A. On the Town’s website under the “Interactive Development” tab is the map of projects. After the zoning package is submitted, the documents will be updated within a week or two.

25. In reviewing the Master Subdivision Plan provided, how is the zoning changing the design?

A. The zoning will require the modification of the Master Subdivision Plan to remove the connection to Jessie Drive as part of the Phase I development. This will be done in conjunction with staff input to clarify the improvements on the property.

The Horton Park rezoning neighborhood meeting was very different from a majority of neighborhood meetings as the neighbors were well informed about the project. This is the 3<sup>rd</sup> zoning for this project based upon the size and complexity of the project. Most of the discussions were centered on previous items committed to or discussed with property owners. The questions asked were more process or overall

“why are you rezoning again” type questions. For this reason, the number of questions from the meeting were limited. It was difficult to track all the discussions.

At the conclusion of the meeting, the neighbors broke up into groups, some asking questions, some talking, and others leaving the meeting. There were a number of clarifications provided one-on-one but no additional conditions or concerns about the project beyond what was asking during the larger group setting. The meeting completed at 7:30 when all questions were answered.

# AFFIDAVIT OF CONDUCTING A NEIGHBORHOOD MEETING, SIGN-IN SHEET AND ISSUES/RESPONSES SUBMITTAL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

I, Jonathan Edwards, do hereby declare as follows:

Print Name

1. I have conducted a Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Master Subdivision Plan, or Special Use Permit in accordance with UDO Sec. 2.2.7 *Neighborhood Meeting*.
2. The meeting invitations were mailed to the Apex Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the Neighborhood Meeting.
3. The meeting was conducted at Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room) (location/address) on 6-27-2019 (date) from 5:30 (start time) to 7:30 (end time).
4. I have included the mailing list, meeting invitation, sign-in sheet, issue/response summary, and zoning map/reduced plans with the application.
5. I have prepared these materials in good faith and to the best of my ability.

6-28-2019

Date

By: 

STATE OF NORTH CAROLINA  
COUNTY OF WAKE

Sworn and subscribed before me, DANIEL WOODS, a Notary Public for the above State and County, on this the 28 day of JUNE, 2019.





Notary Public

DANIEL H WOODS

Print Name

My Commission Expires: 11/18/23

Project Identification and Legal Description

**Horton Park PUD**

Apex, White Oak Township  
Wake County, North Carolina  
Revised July 1, 2019

Horton Park property with the following Wake County Property Identification Numbers (PINs): 0751-42-1387, 0751-31-9308, 0751-31-0079, 0750-39-0993, 0751-40-0194, 0750-39-8682, 0750-49-5371, 0750-29-9342, 0750-28-0998, 0750-27-0906, 0750-27-4707, 0750-27-8677, and 0750-27-8925 located in the Apex's ETJ, between Jessie Drive and Colby Chase Drive, Apex, NC.

Commencing at an existing iron pipe at the northwest corner of N/F MFW Investments, LLC property (PIN# 0751-31-9308), said point intersects with southern line of N/F Trinity Apex North 100, LLC property (PIN# 0751-32-3228), and the northeast corner of N/F Fred Cash Jr. (PIN # 0751-31-0079), said point being the POINT OF BEGINNING;

thence N 01°34'29" E for 36.51' to an existing iron pipe at the northern Jessie Drive;

thence N 01°34'29" E for 30.22' to an existing iron pipe at the southern corner of N/F Trinity Apex North 100, LLC (PIN# 0751-42-1387);

thence N 01°34'29" W for 472.23' to a point along the N/F Blanche Hinton (PIN# 0751-32-8256) property line;

thence N 75°28'14" E for 47.89' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence S 70°56'43" E for 19.41' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 35°58'42" E for 29.34' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 64°47'45" E for 28.00' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 35°16'15" E for 29.31' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 00°20'08" E for 28.40' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 62°27'55" E for 32.05' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 10°59'28" W for 21.69' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 49°05'39" E for 103.19' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence S 76°41'38" E for 45.82' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence S 10°05'29" E for 28.71' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 83°54'46" E for 28.00' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence S 65°07'03" E for 45.42' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 75°33'41" E for 27.20' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 26°33'47" E for 42.52' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence N 89°35'33" E for 13.97' to a point along the N/F Indus Real Associates LLC property (PIN# 0751-42-6828);

thence S 01°50'31" W for 476.05' to a point along the N/F Blanche Hinton property (PIN# 0751-42-4433) ending at a point on the Jessie Drive northern Right of Way line;

thence S 01°50'31" W for 66.76' to a point along the Jessie Drive southern Right of Way line;

thence S 01°50'31" W for 426.99' to a point along the N/F Blanche Hinton property (PIN# 0751-41-4924);

thence S 01°54'49" W for 118.52' to a point along the N/F KK Land Inc. property (PIN# 0751-41-0857);

thence S 01°49'17" W for 625.99' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 89°11'21" W for 2.52' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 72°37'10" W for 92.98' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 73°45'10" W for 80.25' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 60°10'47" W for 49.51' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 81°52'01" W for 67.16' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 40°49'23" W for 22.21' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 70°25'32" W for 99.01' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 24°18'53" W for 34.03' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 77°13'16" W for 50.45' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 37°21'11" W for 127.24' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 84°47'45" W for 53.66' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 48°53'39" W for 94.23' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 79°54'53" W for 164.77' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence N 79°57'29" W for 36.14' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 87°46'00" W for 14.26' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697);

thence S 66°52'27" W for 76.36' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697) said point intersects with N/F Fred Cash Jr. property (PIN# 0751-31-0079);

thence S 07°14'12" E for 317.37' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697) said point intersects with N/F Mary Elizabeth Horton property (PIN# 0750-39-0993);

thence S 83°27'48" E for 187.41' to a point along the N/F KK Land Inc. property (PIN# 0751-40-0697) said point intersects with the northwest corner of the N/F MFWIRA, LLC property (PIN# 0751-40-0194);

thence S 83°27'48" E for 973.40' to a point in the southeast corner of the N/F KK Land Inc. property (PIN# 0751-40-0697) and the southwest corner of the N/F Sirrhan Griffin property (PIN# 0751-40-7981);

thence S 83°27'48" E for 337.45' to a point along the N/F Sirrhan Griffin property line (PIN# 0751-40-7981);

thence S 83°31'08" E for 16.61' to a point along the N/F Sirrhan Griffin property (PIN# 0751-40-7981 and the northwest corner of the N/F Dwight Wright property (PIN # 0750-49-8888);

thence S 28°37'14" W for 730.70' along the N/F Dwight Wright property (PIN# 0750-49-8888) to the southwest corner of said Wright property;

thence along a curve S 45°33'02" E with a radius 1,097.99' and chord length 144.18' to a point along the N/F Dwight Wright property (PIN# 0750-49-8888);

thence S 41°47'10" E for 763.27' to a point along the N/F Dwight Wright property (PIN# 0750-49-8888); said point being the centerline of Smith Road;

thence S 39°45'17" W for 30.00' to a point along the centerline of Smith Road;

thence N 41°47'45" W for 390.80 to a point along the N/F William Horton property (PIN# 0750-49-9041);

thence S 30°04'18" W for 604.83' to a point along the N/F William Horton property (PIN# 0750-49-9041) said point intersects with N/F Martha Burnet (PIN# 0750-48-5688);

thence N 62°26'59" W for 306.49 to a point along the N/F Martha Burnet property (PIN# 0750-48-5688), the N/F Richard Bacholzky property (PIN# 0750-48-4775) and N/F Kenneth Moushegian property (PIN# 0750-48-3860) said point intersects with N/F Joshua Beck property (PIN# 0750-49-2134);

thence N 26°52'23" E for 354.32' to a point along the N/F Joshua Beck property (PIN# 0750-49-2134);

thence N 77°31'26" W for 861.72' to a point along the N/F Joshua Beck property (PIN# 0750-49-2134) said point intersects with N/F Melissa Hinton property (PIN# 0750-39-5262);



thence N 77°28'29" W for 149.98' to a point along the N/F Melissa Hinton property (PIN# 0750-39-5262) said point intersects with N/F Mary Elizabeth Horton property (PIN# 0750-39-0993);  
thence N 77°33'04" W for 275.75' to a point along the N/F Eugene Horton Heirs property (PIN# 0750-39-3222) said point intersects with N/F Merion Investment Properties LLC property (PIN# 0750-29-9342);  
thence S 23°52'03" W for 340.31' to a point along the N/F Eugene Horton Heirs property (PIN# 0750-39-3222) said point intersects with N/F Matt Horton property (PIN# 0750-29-9045);  
thence N 66°07'57" W for 585.43' to a point along the N/F Matt Horton property (PIN# 0750-29-9045) said point intersects with N/F MFW Investments LLC property (PIN# 0750-29-2070);  
thence S 07°36'44" W for 246.69' to a point along the N/F Matt Horton property (PIN# 0750-29-9045) said point intersects with N/F Alton Richardson property (PIN# 0750-28-8880);  
thence S 07°36'44" W for 274.24' to a point along the N/F Alton Richardson property (PIN# 0750-28-8880) said point intersects with N/F Donald Richardson property (PIN# 0750-28-8532);  
thence S 07°36'44" W for 313.79' to a point along the N/F Donald Richardson property (PIN# 0750-28-8532) said point intersects with N/F Donald Richardson property (PIN# 0750-28-6271);  
thence S 07°36'44" W for 9.43' to a point along the N/F Donald Richardson property (PIN# 0750-28-6271) said point intersects with N/F Loomis Horton Heirs property (PIN# 0750-27-4707);  
thence S 07°00'15" W for 588.50' to a point along the N/F Donald Richardson property (PIN# 0750-28-6271);  
thence S 85°42'32" E for 165.00' to a point on the southeast corner of the N/F Donald Richardson property (PIN# 0750-28-6271) said point intersects with N/F Merion Investments LLC property (PIN# 0750-27-8677);  
thence S 85°42'32" E for 40.00' to a point along the N/F Merion Investments LLC property (PIN# 0750-27-8677) said point in the southwest corner of the N/F Virginia Stewart property (PIN# 0750-27-8925);  
thence N 04°17'28" E for 210.00' to a point which in the northwest corner of the N/F Virginia Horton Stewart parcel (PIN# 0750-27-8677);  
thence S 85°42'32" E for 164.54' along the N/F Virginia Horton Stewart parcel (PIN# 0750-27-8677);  
thence S 85°42'32" E for 45.46' to a point which is the northeast corner of the N/F Virginia Horton Stewart parcel (PIN# 0750-27-8677);

thence S 04°17'28" W for 210.00' to a point which in the southeast corner of the N/F Virginia Horton Stewart parcel (PIN# 0750-27-8677) and an existing iron pin in the southwest corner of the N/R Robert Heise property (PIN# 0750-37-1996);

4thence S 81°29'17" E for 436.45' to a point along the N/F Merion Investments LLC property (PIN# 0750-27-8677) said point intersects with N/F Robert Cathey property (PIN# 0750-37-3664);

thence S 60°32'28" W for 824.16' to a point along the N/F Merion Investments LLC property (PIN# 0750-27-8677) said point intersects with N/F Robert Cathey property (PIN# 0750-37-3664), N/F Richard Stewart property (PIN# 0750-37-2555), N/F Dennis Dale property (PIN# 0750-37-1540), N/F Todd Young property (PIN# 0750-37-0454), N/F John Falchi property (PIN# 0750-27-9358) and George King property (PIN# 0750-27-8301), said point intersects with N/F Loomis Horton Heirs property (PIN# 0750-27-4707);

thence S 02°56'47" W for 73.32' to a point along the N/F Loomis Horton Heirs property (PIN# 0750-27-4707) said point intersects with N/F MFW Investments LLC property (PIN# 0750-26-4926);

thence N 77°50'29" W for 487.73' to a point along the N/F MFW Investments LLC property (PIN# 0750-26-4926) said point intersects with N/F Patricia Jones property (PIN# 0750-27-0906) and N/F Pemberley Property Owners' Association, Inc. property (PIN# 0750-17-6279);

thence N 77°50'39" W for 8.51' along the southern boundary of N/F Patricia Jones (PIN# 0750-27-0906);

thence N 77°50'39" W for 424.69' to the southwest corner of the N/F Patricia Jones property (PIN# 0750-27-0906) along the N/F Pemberley Property Owners' Association, Inc. property (PIN# 0750-17-6279);

thence N 06°15'00" E 997.21' to a point in the northwest corner of the N/F Patricia Jones property (PIN# 0750-27-0906);

thence S 83°40'10" E for 162.45' to a point along the N/F Patricia Jones property (PIN# 0750-27-0906) said point intersects with N/F MFW Investments LLC property (PIN# 0750-19-7053 and 0750-29-2070);

thence N 45°39'39" E for 56.43' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 01°01'01" E for 301.17' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 07°47'37" W for 187.77' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 24°12'03" W for 113.39' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 24°46'59" E for 71.19' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 26°33'54" W for 64.44' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 37°00'06" E for 121.55' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 07°08'18" E for 106.61' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 52°04'00" E for 50.09' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053);

thence N 26°44'55" E for 75.53' to a point along the N/F MFW Investments LLC property (PIN# 0750-19-7053), said point intersects with N/F Charles Womble property (PIN# 0750-29-0721);

thence S 83°33'51" E for 583.20' to a point along the N/F Charles Womble property (PIN# 0750-29-0721) said point intersects with the N/F Mary Elizabeth Horton property (PIN# 0750-39-0993) and the N/F Merion Investment Properties LLC property (PIN# 0750-29-9342);

thence N 08°41'45" E for 946.00' to a point along the N/F Charles Womble property (PIN# 0750-29-0721) said point intersects with N/F Fred Cash Jr. property (PIN# 0751-31-0079);

thence N 03°13'00" E for 1316.79' to a point along the N/F Charles Womble property (PIN# 0750-29-0721) said point intersects with N/F Trinity Apex North 100 LLC property (PIN# 0751-32-3228);

thence S 87°52'51" E for 659.44 to a point along the N/F Trinity Apex North 100 LLC property (PIN# 0751-32-3228), said point intersects with N/F MFW Investments LLC property (PIN# 0751-31-9308)

thence N 71°52'08" E for 205.23 to a point along N/F Trinity Apex North 100 LLC property (PIN# 0751-32-3228);

thence N 65°28'18" E for 379.18' to an existing iron pipe along the N/F Trinity Apex North 100, LLC (PIN# 0751-32-3228) property line, said point being the POINT OF BEGINNING.

Said property includes approximately 6,405,520 square feet or 146.899 acres.

List of Plats referenced to complete legal description.

- Recombination Survey Property of Trinity Apex North 100, LLC BM 2016 PG 1901
- Exempt Plat Property of Trinity Apex North 100, LLC Subdivision BM 2016 PG 1677
- Horton Heirs Properties BM 2015 PG 1973
- Map of Carcillar Horton “Estate Division” BM 1988 PG 754
- Division of E.L. Horton BM 1942 PG 114
- C.O. Heavner, Heirs and Joseph Ira Lee, Et Ux BM 2006 Pg 0172
- Exempt Division Survey Property of MFW Investments, LLC – BM 2017 Pg 1067
- Exempt Recombination Plat – Tract 2A and Tract 2B Horton Heirs Properties BM2017 Pg2004
- Estate Division – Carcillar Horton – BM1988 Pg754
- Patricia Jones property Deed – DB 2900 Pg 698

## PETITION TO AMEND THE OFFICIAL ZONING MAP & 2045 LAND USE MAP

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Application #: 19CZ16 Submittal Date: 7/1/19  
2045 LUM Amendment: \_\_\_\_\_ Fee Paid: \_\_\_\_\_

### Project Information

Project Name: Horton Park - TF-CZ district  
Address(es): 5220 Jessie Drive  
PIN(s): 0751-31-0079 (north of the southern creek) and 0751-31-9308 (west of the Colonial pipeline easement)  
Acreage: 19.06 acres  
Current Zoning: PUD-CZ Proposed Zoning: TF-CZ  
Current 2045 LUM Designation: Office Employment/Industrial Employment  
Proposed 2045 LUM Designation: Office Employment/Industrial Employment

See next page for LUM Amendment.

If any portion of the project is shown as mixed use (3 or more stripes on the 2045 Land Use Map) provide the following:

Area classified as mixed use:	Acreage:	<u>N/A</u>
Area proposed as non-residential development:	Acreage:	<u>N/A</u>
Percent of mixed use area proposed as non-residential:	Percent:	<u>N/A</u>

### Applicant Information

Name: Mike Whitehead - MFW Investments, LLC  
Address: 114 Birklands Drive  
City: Cary State: NC Zip: 27518  
Phone: (919) 801-3905 E-mail: mwhitehead@macgregordev.com

### Owner Information

Name: same  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

### Agent Information

Name: Peak Engineering & Design, PLLC - Jeff Roach  
Address: 1125 Apex Peakway  
City: Apex State: NC Zip: 27502  
Phone: (919) 439-0100 E-mail: jroach@peakengineering.com

Other contacts: Fred Spinnenweber (fspinnenweber@peakengineering.com)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**PETITION TO AMEND THE OFFICIAL ZONING MAP & 2045 LAND USE MAP**

Application #: \_\_\_\_\_ Submittal Date: \_\_\_\_\_

**2045 LAND USE MAP AMENDMENT (IF APPLICABLE)**

The applicant does hereby respectfully request the Town Council amend the 2045 Land Use Map. In support of this request, the following facts are shown:

The area sought to be amended on the 2045 Land Use Map is located at:

N/A

Current 2045 Land Use Classification: Office Employment/Industrial Employment

Proposed 2045 Land Use Classification: \_\_\_\_\_

What condition(s) justifies the passage of the amendment to the 2045 Land Use Map? Discuss the existing use classifications of the subject area in addition to the adjacent land use classifications. Use additional pages as needed.

NO CHANGES TO THE LAND USE DESIGNATION IS PROPOSED

## PETITION INFORMATION

Application #: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

An application has been duly filed requesting that the property described in this application be rezoned from PUD-CZ to TF-CZ. It is understood and acknowledged that if the property is rezoned as requested, the property described in this request will be perpetually bound to the use(s) authorized and subject to such conditions as imposed, unless subsequently changed or amended as provided for in the Unified Development Ordinance. It is further understood and acknowledged that final plans for any specific development to be made pursuant to any such Conditional Zoning shall be submitted for site or subdivision plan approval. Use additional pages as needed.

## PROPOSED USES:

The Rezoned Lands may be used for, and only for, the uses listed immediately below. The permitted uses are subject to the limitations and regulations stated in the UDO and any additional limitations or regulations stated below. For convenience, some relevant sections of the UDO may be referenced; such references do not imply that other sections of the UDO do not apply.

1	<u>Church or place of worship</u>	21	<u>Artisan studio</u>
2	<u>Day care facility</u>	22	<u>Convenience store</u>
3	<u>Drop-in or short-term day care</u>	23	<u>Convenience store with gas sales</u>
4	<u>Government service</u>	24	<u>Grocery, general</u>
5	<u>Veterinary clinic or hospital</u>	25	<u>Grocery, specialty</u>
6	<u>Vocational school</u>	26	<u>Health/fitness center or spa</u>
7	<u>Utility, minor</u>	27	<u>Personal service</u>
8	<u>Botanical garden</u>	28	<u>Pharmacy</u>
9	<u>Entertainment, indoor</u>	29	<u>Printing and copying service</u>
10	<u></u>	30	<u>Real estate sales</u>
11	<u>Greenway</u>	31	<u>Repair services, limited</u>
12	<u>Park, active</u>	32	<u>Studio for art</u>
13	<u>Park, passive</u>	33	<u>Tailor shop</u>
14	<u>Restaurant, general</u>	34	<u>Upholstery shop</u>
15	<u>Dispatching office</u>	35	<u>Pet services</u>
16	<u>Medical or dental office or clinic</u>	36	<u>Laboratory, industrial research</u>
17	<u>Medical or dental laboratory</u>	37	<u>Microbrewery</u>
18	<u>Office, business or professional</u>	38	<u>Microdistillery</u>
19	<u>Publishing office</u>	39	<u></u>
20	<u>Research facility</u>	40	<u></u>





**PETITION INFORMATION**

Application #: \_\_\_\_\_ Submittal Date: \_\_\_\_\_

3) Zoning district supplemental standards. The proposed Conditional Zoning (CZ) District use’s compliance with Sec 4.4, Supplemental Standards, if applicable.

The proposed uses will meet the required Supplemental Standards per UDO section 4.4 as applicable.

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4) *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use’s minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.

The design provides for perimeter buffers, architectural controls, access, and utility connections to avoid adverse impacts on the surrounding residential and non-residential properties.

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5) *Design minimizes environmental impact.* The proposed Conditional Zoning District use’s minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.

The is proposed to meeting UDO standards for design controls, including minimization and avoidance of environmentally sensitive areas, limited site impacts, and reduction in removal of perimeter vegetation.

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6) *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use’s avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.

The site is located in close proximity or will be extending public facilities to the property in conjunction with the Horton Park project. This includes water, sewer, stormwater, streets, gas, electric, telephone, and cable services. The site is located south of Jessie Drive (Major Thoroughfare) and will have excellent access for emergency vehicles and personnel.

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7) *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use’s effect on the health, safety, or welfare of the residents of the Town or its ETJ.

The proposed uses on the property will not be detrimental to the health, safety, and welfare of Apex and Wake County residents. The uses will provide services to the surrounding property owners.

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**PETITION INFORMATION**

Application #: \_\_\_\_\_ Submittal Date: \_\_\_\_\_

8) *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.

The uses are in keeping with the Town of Apex's standards for non-residential/Tech-Flex zoning sounded by Light Industrial, Horton Park's residential parcels, and the major street network.

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9) *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.

The list of uses permitted on the property do not constitute a nuisance or hazard based upon anticipate traffic numbers, noise, or number of persons expected to utilize the properties.

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10) *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.

The proposed zoning and future Minor Site Plan for each use will comply with the standards established by the UDO, adopted plans, and details/specifications. The designs will meet standard development patterns and use requirements.

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**Horton Park**  
**Tech/Flex – Conditional Zoning (TF-CZ) District**  
**Architectural Standards for Non-Residential Structures**

1. Maximum non-residential building height is 65'.
2. Building shall be architecturally compatible through the use of similar colors and building materials. Buildings shall be consistent in scale, massing, style, and relationship to adjacent streets.
3. Building placement shall be done to maximize parking in the rear or side of buildings. Drive-thrus, pick-up windows, loading areas, trash facilities, and other accessory items for uses are encouraged to be oriented away from adjacent streets.
4. Buildings shall have vertical breaks across any facade which faces an adjacent street. Windows and other store front treatments shall be proportional to the building height and width. Horizontal and vertical setbacks shall be used to provide a visual break in the building mass. Various architectural features shall be incorporated, including roofline changes, parapet heights, columns, piers, and material patterns to create various façade breaks.
5. Exterior materials for non-residential structures shall be a combination of materials. The primary façade (front) or any façade facing a street shall include:
  - Brick
  - Wood
  - Stacked stone or other native stone
  - Decorative block (integrally colored or textured) masonry units
  - EIFS cornices and parapet trim (EIFS or stucco shall not be used within 4 feet of ground and shall be limited to 25% of each building façade)
  - Precast concrete
6. The developer of the Horton Park PUD or the developer of the subject property shall construct and dedicate the portion of the Collector Street as shown on the Apex Transportation Plan on the subject property.

**CERTIFIED LIST OF NEIGHBORING PROPERTY OWNERS**

Application #: \_\_\_\_\_

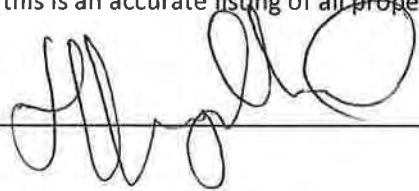
Submittal Date: \_\_\_\_\_

Provide a certified list of property owners subject to this application and all property owners within 300' of the subject property and HOA Contacts.

Owner's Name	PIN
1. SEE ATTACHED LIST	
2. _____	
3. LIST IS PART OF THE HORTON PARK NEIGHBORHOOD	
4. MEETING LIST AND OTHER DOCUMENTS	
5. _____	
6. _____	
7. _____	
8. _____	
9. _____	
10. _____	
11. _____	
12. _____	
13. _____	
14. _____	
15. _____	

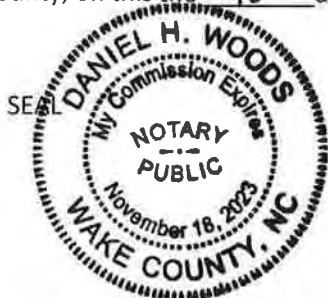
I, JEFFREY A. ROACH, certify that this is an accurate listing of all property owners and property owners within 300' of the subject property.


Date: 6/28/2019

By: 

COUNTY OF WAKE STATE OF NORTH CAROLINA

Sworn and subscribed before me, DANIEL H. WOODS, a Notary Public for the above State and County, on this the 28 day of JUNE, 2019.



  
 Notary Public  
DANIEL H. WOODS  
 Print Name

My Commission Expires: 11/18/23

TRINITY APEX NORTH 100 LLC  
106 ISLAND VIEW DR  
BEAUFORT NC 28516-9108  
0750085838

PAGE TWO HOLDINGS LLC RODESSA LLC  
940 SE CARY PKWY STE 102  
CARY NC 27518-7417  
0750095624

STEELE, GERTRUDE  
1713A E WILLIAMS ST  
APEX NC 27539-7706  
0750096187

PEMBERLEY PROPERTY OWNERS' ASSOCIATION,  
INC., CHARLESTON MGMT  
PO BOX 97243  
RALEIGH NC 27624-7243  
0750176279

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750184078

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750197426

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750264926

MUSE, EDWARD MUSE, ROBIN  
3305 COLBY CHASE DR  
APEX NC 27539-3602  
0750267955

KUNSMAN, STEVEN A KUNSMAN, SUSAN E  
5408 MERION STATION DR  
APEX NC 27539-3603  
0750269948

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750270906

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750274707

FELTON, TIMOTHY M FELTON, ALLISON C  
3304 COLBY CHASE DR  
APEX NC 27539-3601  
0750278301

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750278677

MFW INVESTMENTS, LLC  
7837 SMITH RD  
APEX NC 27539-8170  
0750278925

FALCHI, JOHN J FALCHI, JOYCE T  
3232 COLBY CHASE DR  
APEX NC 27539-3620  
0750279358

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750280998

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750286271

RICHARDSON, DONALD FELIX  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750288532

RICHARDSON, ALTON RICHARDSON, TERESA  
1295 WINDHAM RD  
GREENVILLE NC 27834-7093  
0750288880

HORTON, MATTHEW  
4 ARBOR LN  
BORDENTOWN NJ 08505-4807  
0750299045

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0750299342

YOUNG, TODD C YOUNG, GLORIA C  
3228 COLBY CHASE DR  
APEX NC 27539-3620  
0750370454

DALE, DENNIS DALE, ROBERTA  
3224 COLBY CHASE DR  
APEX NC 27539-3620  
0750371540

HEISE, ROBERT H HEISE, CARY VIVIAN  
2408 MERION CREEK DR  
APEX NC 27539-6300  
0750371996

STEWART, RICHARD J STEWART, MARY A  
3220 COLBY CHASE DR  
APEX NC 27539-3620  
0750372555

CATHEY, ROBERT E III CATHEY, KRISTA B  
3212 COLBY CHASE DR  
APEX NC 27539-3620  
0750373664

RHODES, AMANDA C RHODES, STEVEN A  
3208 COLBY CHASE DR  
APEX NC 27539-3620  
0750375700

PIETZ, BRYAN PIETZ, JORDAN  
2400 MERION CREEK DR  
APEX NC 27539-6300  
0750375774

KANODE, MARK E KANODE, LORI D  
3204 COLBY CHASE DR  
APEX NC 27539-3620  
0750376759

PIETZ, BRYAN S PIETZ, JORDAN  
2400 MERION CREEK DR  
APEX NC 27539-6300  
0750383293

COFFER, LANA HORTON  
3113 CARRIAGE LIGHT CT  
RALEIGH NC 27604-6117  
0750385765

MERION HOMEOWNERS ASSOCIATION INC  
OMEGA ASSOCIATION MANAGEMENT INC  
160 NE MAYNARD RD STE 210  
CARY NC 27513-9676  
0750387004

HORTON, MARY ELIZABETH  
PO BOX 306  
APEX NC 27502-0306  
0750390993

HORTON, CHARLES LEON, SARAH  
8804 STEPHENSON RD  
APEX NC 27539-8170  
0750393222

HINTON, MELISSA D  
5137 DEZOLA ST  
APEX NC 27539-9529  
0750395262

MANSFIELD, MARISA MANSFIELD, MICHAEL  
5133 DEZOLA ST  
APEX NC 27539-9529  
0750398002

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750398682

RYDESKY, THOMAS E RYDESKY, LINDA U  
5232 LEVERING MILL RD  
APEX NC 27539-3610  
0750480767

HORNADA, JEFFREY MICHAEL HORNADA,  
KARA LEIGH  
5228 LEVERING MILL RD  
APEX NC 27539-3610  
0750481855

SURA, PIYUSH SURA, SMITA P  
5229 LEVERING MILL RD  
APEX NC 27539-3640  
0750482535

POZDER, VLADIMIR POZDER, JULI W  
5224 LEVERING MILL RD  
APEX NC 27539-3610  
0750482864

SINGLETARY, MICHAEL SINGLETARY, LAETITIA  
5217 LEVERING MILL RD  
APEX NC 27539-3640  
0750483541

MOUSHEGIAN, KENNITH C MOUSHEGIAN,  
CINDY W  
5220 LEVERING MILL RD  
APEX NC 27539-3610  
0750483860

GREENE, WILLIAM BLAKE GREENE, LAUREN  
KIRBY  
5213 LEVERING MILL RD  
APEX NC 27539-3640  
0750484438

BACHOLZKY, RICHARD JR BACHOLZKY, KATHRYN  
5216 LEVERING MILL RD  
APEX NC 27539-3610  
0750484775

MEHTA, RUSHIKESH J TRUSTEE RUSHIKESH J  
MEHTA REVOCABLE TRUST  
5209 LEVERING MILL RD  
APEX NC 27539-3640  
0750485424

BURNET, MARTHA SNYDER TRUSTEE BURNET,  
GILBERT NEFF TRUSTEE  
5208 LEVERING MILL RD  
APEX NC 27539-3610  
0750485688

RUSNAK, DAVID W RUSNAK, PAMELA P  
5205 LEVERING MILL RD  
APEX NC 27539-3640  
0750486339

MADRID, RICHARD J MADRID, RENE MONIQUE  
5204 LEVERING MILL RD  
APEX NC 27539-3610  
0750487632

KEENE, CHRISTOPHER P KEENE, ANNA E  
5200 LEVERING MILL RD  
APEX NC 27539-3610  
0750488577

HORTON, WILLIAM JR HORTON, EDNA  
8208 SMITH RD  
APEX NC 27539-8176  
0750488737

HORTON, WILLIAM JR  
8208 SMITH RD  
APEX NC 27539-8176  
0750489723

HORTON, WILLIAM JR BURRIS, JULIA HORTON  
8208 SMITH RD  
APEX NC 27539-8176  
0750489886

BECK, JOSHUA KEVIN BECK, KATHERINE  
CLEMMONS  
5129 DEZOLA ST  
APEX NC 27539-9529  
0750492134

HORTON, KIMBERLY A HORTON, LOOMIS III  
4801 SW 202ND AVE  
SOUTHWEST RANCHES FL 33332-1033  
0750495371

WRIGHT, DWIGHT MARVIN  
407 S SALEM ST  
APEX NC 27502-2037  
0750498888

HORTON, WILLIAM JR HORTON, EDNA  
8208 SMITH RD  
APEX NC 27539-8176  
0750499041

HORTON, WILLIAM SR HEIRS HORTON,  
LOOMIS JR HEIRS, WILLIAM HORTON JR  
8208 SMITH RD  
APEX NC 27539-8176  
0750499710

HORTON, WILLIAM HORTON, EDNA W  
8208 SMITH RD  
APEX NC 27539-8176  
0750582794

HORTON, WILLIAM JR HORTON, EDNA WILLIS  
8205 SMITH RD  
APEX NC 27539-8177  
0750583990

HORTON, WILLIAM HORTON, EDNA W  
8208 SMITH RD  
APEX NC 27539-8176  
0750591257

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750592361

RICHARDSON, DONALD F  
1630 VAN BUREN ST NW  
WASHINGTON DC 20012-2838  
0750592399

DOWNING, OSWALD DOWNING, DEBORAH H  
8129 SMITH RD  
APEX NC 27539-8175  
0750594097

GANDHI, ANIL R GANDHI, NEHA A  
105 BONNIEWOOD DR  
CARY NC 27518-8961  
0750596206

JACK 1, LLC  
738 CASH ST  
APEX NC 27502-1302  
0751137742

WOMBLE, CHARLES H ET AL WOMBLE, GLEN  
802 BELLAMY RD  
NORTH MYRTLE BEACH SC 29582-2828  
0751201670



MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751216689

PRISTINE PARTNERS LLC  
2821 JONES FRANKLIN RD  
RALEIGH NC 27606-4007  
0751222279

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751310079

MFW INVESTMENTS, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751319308

TRINITY APEX NORTH 100 LLC  
106 ISLAND VIEW DR  
BEAUFORT NC 28516-9108  
0751323228

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751328256

MFWIRA, LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751400194

KK LAND INC  
2203 GOOD SHEPHERD WAY  
APEX NC 27523-6947  
0751400697

GRIFFIN, SIRRHAN GRIFFIN, JOSEPH A  
1038 IRONGATE DR  
APEX NC 27502-6505  
0751407981

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751414924

HUNTER, MELVIN O HUNTER, NICOLE  
5037 JESSIE DR  
APEX NC 27539-8859  
0751415915

MFW INVESTMENTS LLC  
114 BIRKLANDS DR  
CARY NC 27518-8203  
0751421387

HINTON, BLANCHE W  
4929 JESSIE DR  
APEX NC 27539-9302  
0751424433

TOOMER, JOE ELLIS TOOMER, FANNIE O  
PO BOX 676  
APEX NC 27502-0676  
0751426099

INDUS REAL ASSOC LLC  
4713 BROOK TOP CT  
RALEIGH NC 27606-3100  
0751426828

KK LAND INC  
2203 GOOD SHEPHERD WAY  
APEX NC 27523-6947  
0751510857

CAREY C JONES MEMORIAL PARK INC  
PO BOX 781  
APEX NC 27502-0781  
0751532815

**AGENT AUTHORIZATION FORM**

Application #: \_\_\_\_\_

Submittal Date: \_\_\_\_\_

MFW Investments, LLC (Mike Whitehead - Manager) is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 5220 Jessie Drive, Apex, NC (Wake PIN 0751-31-0079) (a portion of the property)

The agent for this project is: Peak Engineering & Design, PLLC (Jeff Roach)

I am the owner of the property and will be acting as my own agent

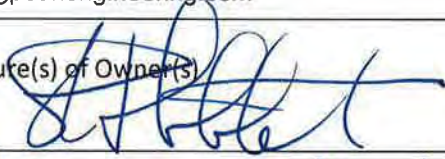
Agent Name: Jeff Roach, P.E. (for Peak Engineering & Design, PLLC)

Address: 1125 Apex Peakway, Apex, NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)



Michael F. Whitehead

Type or print name

\_\_\_\_\_ Date

\_\_\_\_\_ Type or print name

\_\_\_\_\_ Date

\_\_\_\_\_ Type or print name

\_\_\_\_\_ Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**

**AGENT AUTHORIZATION FORM**

Application #: \_\_\_\_\_ Submittal Date: \_\_\_\_\_

Horton Park MF LLC \_\_\_\_\_ is the owner of the property for which the attached application is being submitted:

- Land Use Amendment
- Rezoning
- Site Plan
- Subdivision
- Variance
- Other: \_\_\_\_\_

The property address is: 5101 Jessie Drive, Apex, NC PIN 0751-31-9308 (portion of the property west of the Colonial Pipeline easement)

The agent for this project is: Peak Engineering & Design

I am the owner of the property and will be acting as my own agent

Agent Name: Jeff Roach

Address: 1125 Apex Peakway, Apex, NC 27502

Telephone Number: (919) 439-0100

E-Mail Address: jroach@peakengineering.com

Signature(s) of Owner(s)

Thomas G. Drake  
Member / Manager  
Horton Park MF LLC

Type or print name

6/24/19

Date

Type or print name

Date

Type or print name

Date

Attach additional sheets if there are additional owners.

**\*Owner of record as shown on the latest equalized assessment rolls of Wake County. (An option to purchase does not constitute ownership). If ownership has been recently transferred, a copy of the deed must accompany this authorization.**



# Instruction Packet and Affidavit for Neighborhood Meetings

Town of Apex  
Planning Department  
PO Box 250  
Apex, NC 27502

T: 919-249-3426  
F: 919-249-3338

This packet consists of instructions and templates for conducting a required Neighborhood Meeting. Planning Department staff are available to advise you in the preparation of these materials. Call the Planning Department at (919) 249-3426 for more information.

## WHAT IS THE PURPOSE OF A NEIGHBORHOOD MEETING?

A neighborhood meeting is a required form of community outreach to receive initial feedback regarding certain project types prior to submittal to the Planning Department per the standards found in UDO Sec. 2.2.7. The intention of the meeting is to initiate neighbor communication and identify issues and concerns early on and provide the applicant an opportunity to address neighbor concerns about the potential impacts of the project prior to submitting an application. A neighborhood meeting is valid for six (6) months prior to the submission of an application; a delay in submission requires a new neighborhood meeting.

## WHEN IS A NEIGHBORHOOD MEETING REQUIRED?

- Rezoning (including Planned Unit Developments);
- Major Site Plans;
- Master Subdivision Plan (excluding minor or exempt subdivisions); or
- Special Use Permits

## INSTRUCTIONS

Prior to submitting a Rezoning, Major Site Plan, Master Subdivision Plan (excluding minor or exempt subdivisions), or Special Use Permits, the applicant must conduct at least one (1) Neighborhood Meeting. The applicant shall submit all forms included in this packet with their initial submittal.

The Neighborhood Meeting must be held in accordance with the following rules:

### These groups and individuals must be invited to the meeting:

- The applicant is required to notify the Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the neighborhood meeting, not including the day of mailing. The applicant shall use their own return address on the envelopes as the meeting is a private meeting between the applicant and the neighbors.
- The applicant shall include with the meeting notice a vicinity map in addition to either the existing zoning map of the area or preliminary plans of the proposed development (see Handout requirements below).

**The meeting must be held within specific timeframes and meet certain requirements:**

- The meeting must be held for a minimum of two (2) hours, Monday through Thursday, during the 5:00 p.m. - 9:00 p.m. time period. The meeting cannot be held on a Town recognized holiday (which coincide with the State of North Carolina recognized holidays).
- The meeting shall be held at a place that is generally accessible to neighbors that reside in close proximity to the land subject to the application.
- A sign-in sheet must be used in order to verify attendance. Ensure each attendee signs in. Please note if any person(s) refuses to sign in. Note if no one attended.
- Handout requirements:
  - For rezonings (excluding rezonings to PUD-CZ, TND-CZ and MEC-CZ), a vicinity map and existing zoning map of the area must be provided to help facilitate discussion.
  - For rezonings to PUD-CZ, TND-CZ and MEC-CZ; Major Site Plans; Master Subdivision Plans; and Special Use Permits, preliminary plans of the proposed development must be available at the meeting to help facilitate discussion. Neighbors may request emailed/mailed copies of the maps or plans from the applicant by checking the “send plans” box on the sign-in sheet, and the applicant shall provide reduced copies upon such request.
  - Printed copies must equal the number of notices required to be sent.
  - Contact information for the applicant’s representative must be provided on the handout.
  - A copy of the handout must be included as part of the Neighborhood Meeting report.
- The agenda of the meeting shall include:
  - Explanation of all processes the meeting is being held for (rezoning, subdivision, etc.).
  - Explanation of future meetings (additional neighborhood meetings, Planning Board, Town Council, etc.).
  - Explanation of development proposal – uses and conditions for rezonings, layout for subdivision and site plans, and builder/end user if known/public knowledge.
- Questions or concerns by attendees, and responses by the applicant, if any, must be noted. Provide blank comment sheets or notecards for neighbors to submit written comments. The applicant shall also include any questions and concerns received via written correspondence (such as email) or phone call along with responses provided by the applicant.
- The applicant shall be responsible for notifying any neighbors who check the “Send Plans & Updates” box on the sign-in sheet of any additional neighborhood meetings and the actual submittal date to the Town with a link to the Town of Apex’s Interactive Development Map.

**For accountability purposes, please submit the following with your application:**

- A copy of the letter mailed to neighbors and neighborhood organizations (use attached invitation template);
- A list of those persons and neighborhood organizations invited to the meeting;
- A copy of the sign-in sheet (use attached sign-in sheet template);
- A summary of the meeting and a list of any changes made to the project as a result of the neighborhood comments (use attached meeting summary template);
- The affidavit, signed, dated, and notarized (use attached affidavit template); and
- One reduced copy of the maps and/or plans presented to the neighbors at the Neighborhood Meeting.



June 12, 2019

Adjacent Property Owners and Interested Parties,

RE: Horton Park Rezoning

During the design and review of Horton Park, the timing of NCDOT and Town of Apex projects are beginning to align with the Horton Park timing. For this reason, Horton Park will be submitting a rezoning on July 1st, 2019 to adjust the timing of off-site roadway improvements with three (3) major transportation improvements in mind.

1. Ten Ten Road improvements
2. Highway 55 design and future improvements
3. Jessie Drive design and future improvements/extension

The project will continue to have a mix of residential options (single family, townhomes, and apartments) and non-residential property along the future Jessie Drive corridor. This letter is to inform you that a neighborhood meeting has been scheduled to introduce the rezoning request, the overall Master Subdivision Plan and to answer any questions which you may have. You are welcome to attend the meeting, email me any questions, or call our office to discuss the project.

Meeting Information:

- Date of Neighborhood Meeting: June 27, 2019
- Meeting location: 237 N. Salem Street, Apex, NC 27502 (Halle Cultural Arts Center)
- Time of Meeting: 5:30 PM

If you have any questions concerning the rezoning request, do not hesitate to call or email me at ([jroach@peakengineering.com](mailto:jroach@peakengineering.com)).

Sincerely,

A handwritten signature in black ink, appearing to read "Jeffret A. Roach".

Jeffret A Roach P.E.  
Peak Engineering & Design, PLLC

# NOTICE OF NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

The TF-CZ neighborhood meeting was noticed with the overall Horton Park rezoning meeting below.

June 12, 2019

Date

Dear Neighbor:

You are invited to a neighborhood meeting to review and discuss the development proposal at

See Attached Sheet

See Attached Sheet

Address(es)

PIN(s)

in accordance with the Town of Apex Neighborhood Meeting procedures. The Neighborhood Meeting is intended as a way for the applicant to discuss the project and review the proposed plans with adjacent neighbors and neighborhood organizations before the submittal of an application to the Town. This provides neighbors an opportunity to raise questions and discuss any concerns about the impacts of the project before it is officially submitted. Once an application has been submitted to the Town, it may be tracked using the [Interactive Development Map](#) or the [Apex Development Report](#) located on the Town of Apex website at [www.apexnc.org](http://www.apexnc.org).

A Neighborhood Meeting is required because this project includes (check all that apply):

- Rezoning (including Planned Unit Development);
- Major Site Plan;
- Master Subdivision Plan (excludes minor or exempt subdivision); or
- Special Use Permit

The following is a description of the proposal (also see attached map(s) and/or plan sheet(s)):

To discuss with the adjacent property owners and other interested parties the rezoning request to adjust the phasing of the project, timing of roadway improvements, the rezoning process, and the overall Master Subdivision Plan.

Estimated submittal date: July 1, 2019

## MEETING INFORMATION:

Property Owner(s) name(s):	See Attached
Applicant(s):	Peak Engineering & Design (Jeff Roach); MFW Investments, LLC
Contact information (email/phone):	(919) 439-0100, jroach@peakengineering.com
Meeting Address:	237 N. Salem Street, Apex, NC 27502 (Halle Cultural Arts Center)
Date of meeting*:	June 27, 2019
Time of meeting*:	5:30 -


## MEETING AGENDA TIMES:

Welcome:	5:30 - 5:40
Project Presentation:	5:40 - 6:00
Question & Answer:	6:00 -

\*Meetings shall occur between 5:00 p.m. - 9:00 p.m. on a Monday through Thursday (excluding Town recognized holidays). If you have questions about the general process for this application, please contact the Planning Department at 919-249-3426. You may also find information about the Apex Planning Department and on-going planning efforts at <http://www.apexnc.org/180/Planning>.

Rezoning Application Parcel List  
Horton Park Assembly  
Apex, NC

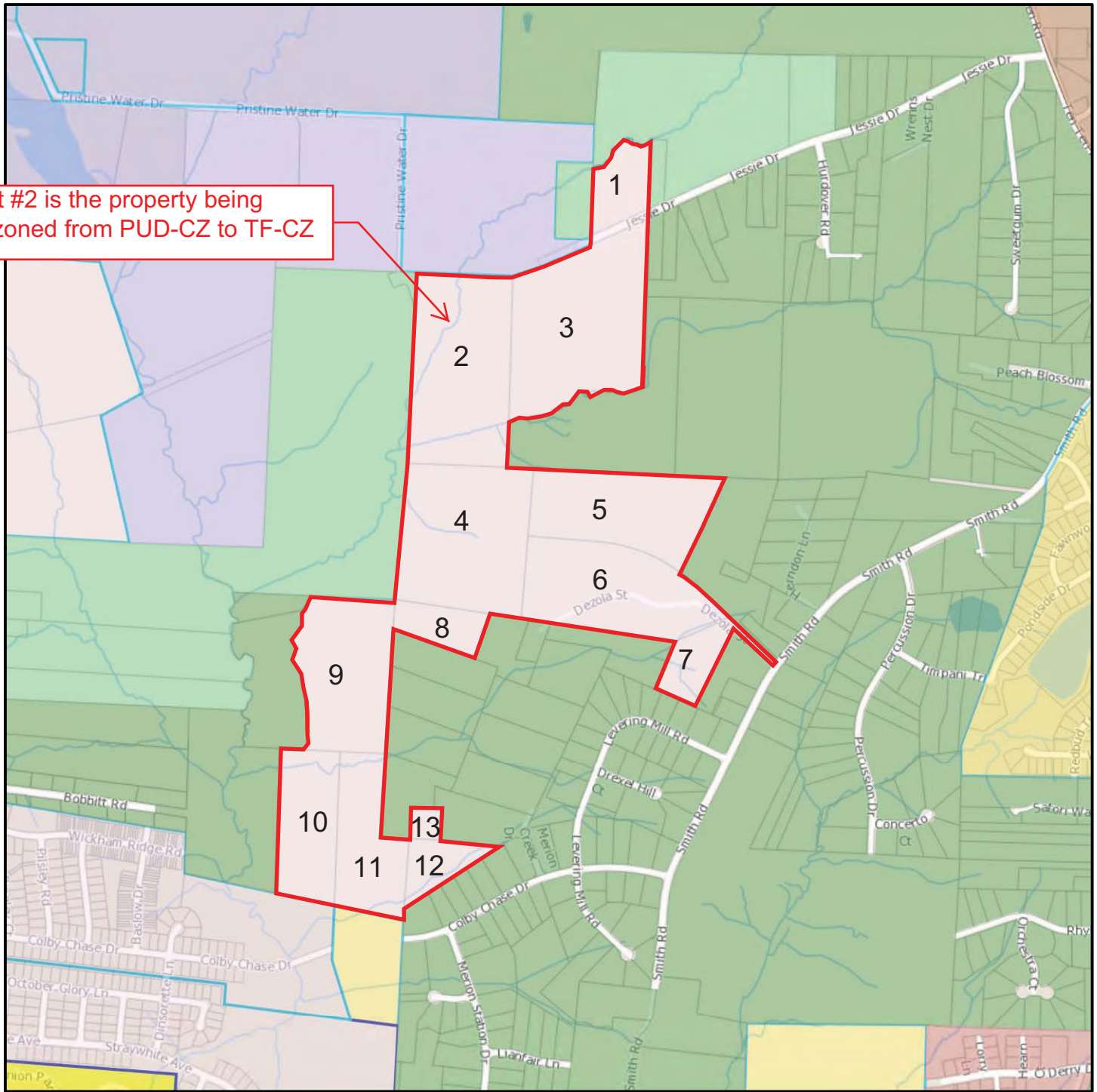
A portion of these properties  
is being rezoned from PUD-  
CZ to TF-CZ



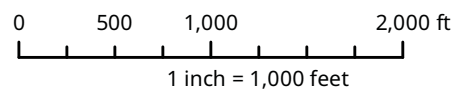
<u>Parcel</u>	<u>Owner</u>	<u>PIN</u>
1	MFW Investments LLC	0751-42-1387
2	MFW Investments LLC	0751-31-0079
3	Horton Park MF, LLC	0751-31-9308
4	Mary Elizabeth Horton	0750-39-0993
5	MFWIRA, LLC	0751-40-0194
6	Kimberly Horton; Loomis Horton III	0750-39-8682
7	Kimberly Horton; Loomis Horton III	0750-49-5371
8	MFW Investments LLC	0750-29-9342
9	MFW Investments LLC	0750-28-0998
10	MFW Investments LLC	0750-27-0906
11	Kimberly Horton; Loomis Horton III	0750-27-4707
12	MFW Investments LLC	0750-27-8677
13	MFW Investments LLC	0750-27-8925



Lot #2 is the property being rezoned from PUD-CZ to TF-CZ



### Horton Park Rezoning



**Disclaimer**  
iMaps makes every effort to produce and publish the most current and accurate information possible. However, the maps are produced for information purposes, and are **NOT** surveys. No warranties, expressed or implied, are provided for the data therein, its use, or its interpretation.

# COMMON CONSTRUCTION ISSUES & WHO TO CALL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

<b>Noise &amp; Hours of Construction:</b>	<b>Non-Emergency Police</b>	<b>919-362-8661</b>
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Noise from tree removal, grading, excavating, paving, and building structures is a routine part of the construction process. The Town generally limits construction hours to 7 a.m. – 8:30 p.m. so that there are quiet times even during the construction process. Note that construction outside of these hours is allowed with special permission from the Town when it makes more sense to have the construction occur at night, often to avoid traffic issues. In addition, the Town limits hours of blasting rock to Monday through Friday from 8:00 a.m. to 5:00 p.m. Report violations of construction hours and other noise complaints to the Non-Emergency Police phone number at 919-362-8661.

<b>Construction Traffic:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
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Construction truck traffic will be heavy throughout the development process, including but not limited to removal of trees from site, loads of dirt coming in and/or out of the site, construction materials such as brick and wood brought to the site, asphalt and concrete trucks come in to pave, etc. The Town requires a construction entrance that is graveled to try to prevent as much dirt from leaving the site as possible. If dirt does get into the road, the Town can require they clean the street (see "Dirt in the Road" below).

<b>Road Damage &amp; Traffic Control:</b>	<b>Water Resources – Infrastructure Inspections</b>	<b>919-362-8166</b>
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There can be issues with roadway damage, roadway improvements, and traffic control. Potholes, rutting, inadequate lanes/signing/stripping, poor traffic control, blocked sidewalks/paths are all common issues that should be reported to Water Resources – Infrastructure Inspections at 919-249-3427. The Town will get NCDOT involved if needed.

<b>Parking Violations:</b>	<b>Non-Emergency Police</b>	<b>919-362-8661</b>
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Unless a neighbor gives permission, there should be no construction parking in neighbors' driveways or on their property. Note that parking in the right-of-way is allowed, but Town regulations prohibit parking within 15 feet of driveways so as not to block sight triangles. Trespassing and parking complaints should be reported to the Non-Emergency Police phone number at 919-362-8661.

<b>Dirt in the Road:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
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Sediment (dirt) and mud gets into the existing roads due to rain events and/or vehicle traffic. These incidents should be reported to Stan Fortier. He will coordinate the cleaning of the roadways with the developer.

<b>Dirt on Properties or in Streams:</b>	<b>Stan Fortier</b> <b>Danny Smith</b>	<b>919-249-1166</b> <b><a href="mailto:Danny.Smith@ncdenr.gov">Danny.Smith@ncdenr.gov</a></b>
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Sediment (dirt) can leave the site and get onto adjacent properties or into streams and stream buffers; it is typically transported off-site by rain events. These incidents should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the appropriate repairs with the developer. Impacts to the streams and stream buffers should also be reported to Danny Smith ([danny.smith@ncdenr.gov](mailto:danny.smith@ncdenr.gov)) with the State.

<b>Dust:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
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During dry weather dust often becomes a problem blowing into existing neighborhoods or roadways. These incidents should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the use of water trucks onsite with the grading contractor to help control the dust.

<b>Trash:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
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Excessive garbage and construction debris can blow around on a site or even off of the site. These incidents should be reported to Stan Fortier at 919-249-1166. He will coordinate the cleanup and trash collection with the developer/home builder.

<b>Temporary Sediment Basins:</b>	<b>Stan Fortier</b>	<b>919-249-1166</b>
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Temporary sediment basins during construction (prior to the conversion to the final stormwater pond) are often quite unattractive. Concerns should be reported to Stan Fortier at 919-249-1166 so that he can coordinate the cleaning and/or mowing of the slopes and bottom of the pond with the developer.

<b>Stormwater Control Measures:</b>	<b>Mike Deaton</b>	<b>919-249-3413</b>
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Post-construction concerns related to Stormwater Control Measures (typically a stormwater pond) such as conversion and long-term maintenance should be reported to Mike Deaton at 919-249-3413.

<b>Electric Utility Installation:</b>	<b>Rodney Smith</b>	<b>919-249-3342</b>
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Concerns with electric utility installation can be addressed by the Apex Electric Utilities Department. Contact Rodney Smith at 919-249-3342.

# NEIGHBORHOOD MEETING SIGN-IN SHEET

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Meeting Address: Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room)

Date of meeting: June 27, 2019 Time of meeting: 5:30

Property Owner(s) name(s): See Attached Sheet

Applicant(s): MFW Investments, LLC

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Falchi	3222 Colby Chase	919		oil.com ✓
2.	Jam Carter	2614 Sweetgum dr	919 749 130		✓
3.	ERMA BURR	2625 Sweetgum DR	919-335-6286		✓
4.	Donna Provance	2624 "	919/335-89		✓
5.	Brian Johnson	3305 Cheswold CT	(919) 602-0542		✓
6.	Moss Wittars	111 ANNANDALE	919-810-24		✓
7.	MIKE MANSFIELD	5133 DEZOLA ST	919-353-518		✓
8.	Suecy Ward	2528 Sweetgum	919-931-19		✓
9.	Karen Peters	5300 Levee Hill Rd			✓
10.	Margaret Griffin	2609 Sweetgum Dr.			✓
11.	Maevyn Hunter	5037 Festiva	919-271-624		✓
12.	Steven Rhodes	3208 Colby Chase			✓
13.	Alton Richardson	1795 Windham Rd Greenville NC	252-757-3044		✓
14.					

Use additional sheets, if necessary.

# NEIGHBORHOOD MEETING SIGN-IN SHEET

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Meeting Address: Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room)

Date of meeting: June 27, 2019 Time of meeting: 5:30

Property Owner(s) name(s): See Attached Sheet

Applicant(s): MFV Investments, LLC

Please print your name below, state your address and/or affiliation with a neighborhood group, and provide your phone number and email address. Providing your name below does not represent support or opposition to the project; it is for documentation purposes only.

	NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL	SEND PLANS & UPDATES
1.	Bushel Black	2521 Sweetgum Dr. <sup>Apex</sup>	(919) 602-83	[REDACTED]	✓
2.	RANDY MANN	106 ISLAND VIEW DR <del>RESURFACED</del>	252-723-06 28516	[REDACTED]	✓
3.	Jordyn Paderno	3216 Winham Ln	919 36373	[REDACTED]	✓
4.	Russell Laurie Bell	5508 Merion Station Dr.	919 303 85	[REDACTED]	✓
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					

Use additional sheets, if necessary.

# SUMMARY OF DISCUSSION FROM THE NEIGHBORHOOD MEETING

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

Property Owner(s) name(s): See Attached Sheet  
Applicant(s): MFW Investments, LLC  
Contact information (email/phone): Jeff Roach, jroach@peakengineering.com  
Meeting Address: Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room)  
Date of meeting: 6-27-2019 Time of meeting: 5:30 -

Please summarize the questions/comments and your response from the Neighborhood Meeting in the spaces below (attach additional sheets, if necessary). Please state if/how the project has been modified in response to any concerns. The response should not be "Noted" or "No Response". There has to be documentation of what consideration the neighbor's concern was given and justification for why no change was deemed warranted.

Question/Concern #1:

SEE ATTACHED LIST OF QUESTIONS AND RESPONSES

Applicant's Response:

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Question/Concern #2:

Applicant's Response:

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Question/Concern #3:

Applicant's Response:

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Question/Concern #4:

Applicant's Response:

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The Horton Park rezoning and Master Subdivision neighborhood meeting started at 5:30 pm with a brief introduction of the project, the location, and general housekeeping items including the sign-in sheets and handouts. This was followed up by a discussion related to what zoning and Master Subdivision Plans are, the timing of the project, and what our role is for the project. This led into the presentation of the proposed Zoning (10 minutes) followed by discussions related to the Master Subdivision Plan (10 minutes).

The floor was then opened to a discussion with questions and answers from the group. Following are the questions and a summary of responses (some of the questions and responses were long-winded, were condensed for clarity/space, or combined with other questions to provide clarity to staff):

1. Why is the project back again? Please clarify the changes again.
  - A. Horton Park is being rezoned for three (3) reasons: (1) modify the conditions and timing associated with off-site roadway improvements; (2) incorporate timing of Phase I and Phase II development with Jessie Drive construction and alignment of the north-south collector street; and (3) removing the “Cash” property from the PUD and zoning it TF-CZ.

The Town of Apex is proposing to design and build Jessie Drive – and the zoning of Horton Park requires the adjustment of a number of zoning conditions to allow the project to start without having Jessie Drive either in place or under construction. The Town’s investment in Jessie Drive as a Major Thoroughfare is something that has been in discussions for a couple years – and Apex sees the benefit of the connection for neighbors, commuters, and life safety personnel.
2. The Sweetgum neighbors were invited to the meeting – is the zoning changing to incorporate more property near Sweetgum Drive?
  - A. No, there is no additional property being added. The property owners on Sweetgum were notified based upon their interest in the original zonings over the past 2-1/2 years.
3. Are there any changes to the design of Jessie Drive @ Ten Ten which would impact the Sweetgum property owners?
  - A. The Town is beginning the design of Jessie Drive @ Ten Ten in the next fiscal year. We are not aware of the final design at this time. Directed the property owners the Town’s website and the Interactive Development Map for upcoming projects – but not sure if Jessie Drive extension would be included until design-permitting was started.
4. Is a traffic signal proposed at Jessie Drive at Ten Ten Road?
  - A. Horton Park Phase I is not proposing to construct Jessie Drive or have any traffic directed to Jessie Drive. The Horton Park study will not evaluate Jessie Drive for a traffic signal. The Town of Apex extension of Jessie Drive “should” evaluate the intersection for the installation of a new signal. That is part of the ongoing discussions with Apex Transportation Staff related to the Jessie Drive extension project.
5. What is the timing of Jessie Drive?
  - A. Per staff discussions, the 2019-2020 budget allocated \$1MM for design and studies of the Jessie Drive corridor. 2021-2022 budget allocates \$10MM for the construction of Jessie Drive from Highway 55 to Ten Ten. This is still up for discussions with the Town of Apex but is the current status of the project.
6. How does the Jessie Drive timing align with the other projects in the area?
  - A. Explained the current schedule for Ten Ten (start in 2023); Highway 55 (unknown at this time); and Jessie Drive (budget \$10mm for 2022 start). This will be reviewed annually to coordinate with NCDOT and other grants or alternate funding sources as soon as possible (per discussions with staff).

7. What is the plan for the barricade at Colby Crossing and the Merion Subdivision?
  - A. Horton Park continues to have the zoning condition to install the barriers on the western edge of Merion on Colby Chase Drive until the Town of Apex determines the connection is needed. No change to this condition worked out with Merion HOA during the previous zoning requests.
8. Are there other conditions which are changing?
  - A. We assured the neighbors that the rezoning is about timing of improvements – not about modification of any of the conditions which were worked on for months through two previous rezonings.
9. What is the Middle Creek pump station? What is a pump station? And where is it located?
  - A. The Middle Creek Regional Pump Station (aka Middle Creek north) is a pump station that is required to pump sewage from Horton Park and other upstream properties to the Town's Water Reclamation Facility on Pristine Water Drive. This pump station is approximately \$4MM in costs for the developer of Horton Park. The pump station is currently planned for the northeastern corner of the intersection of Middle Creek and Colby Chase Drive (same location that it has been in since the initial zoning and Master Subdivision Plan).
10. What do you mean by staff? Are you referring to Planning Department?
  - A. Planning, Engineering, Transportation, Public Works, Fire, and Building Inspections. These are the staff groups which attend the pre-application meetings and we work with on every project.
11. What does minor collector mean?
  - A. A minor collector is a street designation which specifies the street should expect more vehicles than neighborhood streets, have a slightly higher speed (possibly), and act as a funnel to the larger streets (larger streets being Major Collectors, Thoroughfares, and Interstates).
12. Is the Town of Apex proposing to take ownership of Jessie Drive after completion of the extension?
  - A. That is unknown at this time. Current plan is for Jessie Drive to be constructed to Town of Apex standard but retained within the NCDOT maintenance system. That will be determined later.
13. In showing the 2045 Land Use Map, can you explain the different colors and what they mean?
  - A. Went into the definition of medium density (light yellow), medium-high density (light orange), high density (dark orange), light blue (office employment), purple (industrial employment), and green (park). Then explained the difference between the existing ZONING MAP, 2045 LAND USE MAP, and the WAKE GIS.
14. What is the RCA? And where is it proposed?
  - A. Resource Conservation Area (RCA) is the preservation of existing vegetation and environmentally sensitive areas including trees, wetlands, floodplains, steep slopes, and animal habitat. RCA is proposed to be around the property in various locations including those listed above (current MSP was used to identify current RCA locations).
15. How many lots are proposed with the project?
  - A. The number of lots from the original zoning has not changed. In general, approximately 350 single family or townhomes plus the apartment area and Tech-Flex area along Jessie Drive.
16. What is Tech-Flex? And what are the uses permitted?
  - A. Tech-Flex is an office or business zoning with a number of uses. The uses have been limited for this project to included (as an example) day care, vet, entertainment area (indoor or outdoor), restaurants, offices, convenience store, grocery store, repair services, and others. All the uses will be identified in the zoning application on Interactive Development Map once submitted to the Town.

17. What is the development timing?
- A. **Phase I** is the residential portion south of the existing landfill and “N/F Cash Property” which has access to Smith Road and Colby Chase Drive – the property was identified on the maps at the meeting. This section is hoped to be approved in early 2020; construction start in Spring of 2020; full construction build-out of homes in 2024-2025. This timing is based upon the success of the project and any financial changes. **Phase II** of the project is the section along Jessie Drive including PODs 2,3 and 4 which all rely upon Jessie Drive for access – this timing is based upon the timing of Jessie Drive, Ten Ten, and Highway 55 projects.
18. What is the timing of the review by Apex and the Town Council meetings?
- A. Submittal of the rezoning request is July 1, 2019. This will start a 3-4 month process prior to Town Council public hearings. Assuming approval of the zoning, the Master Subdivision Plan (which has previously been approved) will be modified to reflect the changes associated with the rezoning. Construction Documents will then follow for the contractor and permitting. Apex will send out a notification of future Public Hearings based upon the list of contacts we provided (including the Sweetgum Drive property owners).
19. What is the plan for the greenway and connection to surrounding properties?
- A. The Middle Creek Greenway was discussed at length. Middle Creek Greenway is major connection from the Town of Apex to Holly Springs’ greenway system. These projects include Middle Creek Phase I and II (Town of Apex projects), Reunion Pointe, Horton Park, and future projects north of Jessie Drive. Future connection to Lufkin Road and the Town of Cary greenway system in Regency Park.
20. Who will the builder be?
- A. The construction team may be a couple of builders. Final builder team is TBD.
21. In summary, what is the meeting for?
- A. This meeting is to explain the process, the project, and product while gathering information from residents in the area. The questions will be gathered, answers provided, and included in the zoning submittal for Planning Board and Town Council review during the zoning process. Changes to the design documents or the zoning application may be made from comments received.
22. Who can I contact about the project? Town of Apex?
- A. A list of Town of Apex contacts were provided at the meeting. Staff will know about the project but will not know details until after the July 1, 2019 zoning submittal.
23. Who approves the revised rezoning request?
- A. Town Council reviews and ultimately provides final zoning determination.
24. Where can I find the rezoning application once it is submitted?
- A. On the Town’s website under the “Interactive Development” tab is the map of projects. After the zoning package is submitted, the documents will be updated within a week or two.
25. In reviewing the Master Subdivision Plan provided, how is the zoning changing the design?
- A. The zoning will require the modification of the Master Subdivision Plan to remove the connection to Jessie Drive as part of the Phase I development. This will be done in conjunction with staff input to clarify the improvements on the property.

The Horton Park rezoning neighborhood meeting was very different from a majority of neighborhood meetings as the neighbors were well informed about the project. This is the 3<sup>rd</sup> zoning for this project based upon the size and complexity of the project. Most of the discussions were centered on previous items committed to or discussed with property owners. The questions asked were more process or overall



“why are you rezoning again” type questions. For this reason, the number of questions from the meeting were limited. It was difficult to track all the discussions.

At the conclusion of the meeting, the neighbors broke up into groups, some asking questions, some talking, and others leaving the meeting. There were a number of clarifications provided one-on-one but no additional conditions or concerns about the project beyond what was asking during the larger group setting. The meeting completed at 7:30 when all questions were answered.

# AFFIDAVIT OF CONDUCTING A NEIGHBORHOOD MEETING, SIGN-IN SHEET AND ISSUES/RESPONSES SUBMITTAL

This document is a public record under the North Carolina Public Records Act and may be published on the Town's website or disclosed to third parties.

I, Jonathan Edwards, do hereby declare as follows:  
Print Name

1. I have conducted a Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Master Subdivision Plan, or Special Use Permit in accordance with UDO Sec. 2.2.7 *Neighborhood Meeting*.
2. The meeting invitations were mailed to the Apex Planning Department, all property owners within 300 feet of the subject property and any neighborhood association that represents citizens in the area via first class mail a minimum of 10 days in advance of the Neighborhood Meeting.
3. The meeting was conducted at Halle Cultural Arts Center, 237 North Salem Street, Apex, NC 27502 (Gallery Room) (location/address) on 6-27-2019 (date) from 5:30 (start time) to 7:30 (end time).
4. I have included the mailing list, meeting invitation, sign-in sheet, issue/response summary, and zoning map/reduced plans with the application.
5. I have prepared these materials in good faith and to the best of my ability.

6-28-2019  
Date

By: Jonathan Edwards

STATE OF NORTH CAROLINA  
COUNTY OF WAKE

Sworn and subscribed before me, DANIEL WOODS, a Notary Public for the above State and County, on this the 28 day of JUNE, 20 19.



Daniel H Woods  
Notary Public  
DANIEL H WOODS  
Print Name

My Commission Expires: 11/18/23

Legal Description for  
**Tech/Flex – Conditional Zoning**  
Revised August 1, 2019

Boundary description of the proposed Tech/Flex-Conditional Zoning area includes portions of property identified by Wake County GIS as PIN 0751-31-9308 (partial) and 0751-31-0079 (partial). The properties are located south of the future Jessie Drive extension in the Apex ETJ, White Oak Township, and Wake County.

BEING a portion of multiple properties bounded on the North by property N/F Trinity Apex North 100, LLC (BM 2006 Page 360, Wake County Registry); on the south by property of N/F KK Land, Inc (BM 1987 Page 1199, Wake County Registry) and N/F Mary Horton (BM2015 Pg1973, Wake County Registry); and west by property of N/F Womble et al. (DB4443 Pg949, Wake County Registry), more particularly described as follows:

Commencing at an existing iron pipe at the northwest corner of N/F MFW Investments, LLC property (PIN# 0751-31-9308) and the northeast corner of the N/F Fred Cash, Jr. property (PIN 0751-31-0079) as shown on the "Recombination Survey, property of Trinity Apex North 100, LLC" by Riley Surveying, P.A. recorded in Wake County Register of Deeds office Book of Maps 2016 Page 1902, said point being the POINT OF BEGINNING; **thence** N 71°52'08" E for 120.03' to the western edge of the Colonial Pipeline gas easement; **thence** S 05°16'12" W for 1,031.68' to a theoretical point along the southern property line of the N/F MFW Investments, LLC property (PIN 0751-31-9308); **thence** S 66°52'27" W for 52.20' to an existing iron pipe being in the southwest corner of the N/F MFW Investments, LLC property (PIN 0751-31-9308); **thence** S 03°17'44" W for 29.64' to a theoretical point along the eastern boundary of the N/F Fred Cash, Jr. property (PIN 0751-31-0079); **thence** S 77°11'09" W for 688.96' along the south side of an existing creek to a theoretical point along the western boundary of the N/F Fred Cash, Jr. property (PIN 0751-31-0079); **thence** N 02°00'13" E for 1,218.43' to the existing iron pipe in the northwest corner of the N/F Fred Cash, Jr. property (PIN 0751-31-0079); **thence** S 87°50'35" E for 659.92' to an existing iron pipe along the northern property line of the N/F Fred Cash, Jr. property (PIN 0751-31-0079), said point being the POINT AND PLACE OF BEGINNING.

Said property includes approximately 830,332.87 square feet or 19.06 acres.



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Section 17:	Phasing
Section 18:	2045 Land Use Map
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Exhibits

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**Section 2: Vicinity Map**

Horton Park is a property assembly located along the western terminus of Jessie Drive on the north; Colby Chase Drive on the south; Middle Creek on the west; and Smith Road on the east. A Tech-Flex area was part of the original PUD and is now proposed to be removed from the PUD with a request to change the zoning to Tech/Flex-Conditional Zoning (TF-CZ) (a portion of PIN 0751-31-0079 and a portion of 0751-31-9308)





**Executive Summary:**

Horton Park was rezoned in October 2017 (case #17CZ19) and May 2018 (case #18CZ04). The original zoning cases included 146.899 acres (121.109 acres PUD-CZ and 27.92 acres LI-CZ). This zoning case is to modify zoning conditions previously approved, modify the zoning on 19.06 acres from PUD-CZ to TF-CZ, remove all reference to the LI-CZ area (north of Jessie Drive) and clarify the timing of the improvements associated with the development. The following information is related to the overall project description and development opportunities.

**Section 3: Project Data**

Project name: Horton Park

Applicant/Developer: MFW Investments, LLC  
114 Birklands Drive  
Cary, NC 27518-8203  
[mwhitehead@macgregordev.com](mailto:mwhitehead@macgregordev.com)

Prepared by: Peak Engineering & Design, PLLC  
5448 Apex Peakway #368  
Apex, NC 27502  
(919) 439-0100  
[jroach@peakengineering.com](mailto:jroach@peakengineering.com)

Zoning:

Existing Zoning: Planned Unit Development-Conditional Zoning (PUD-CZ)

Proposed Zoning: Planned Unit Development-Conditional Zoning (PUD-CZ)

2045 Land Use Map

Existing Land Use Designation: Medium Density Residential, High Density Residential, High Density Residential/Office Employment

Proposed Land Use: Medium Density Residential, High-Density Residential, High Density Residential/Office Employment (no change proposed)

Total Property: PUD-CZ area: 127.84 acres

Property Data (PINs):

0751-42-1387	0750-39-8682	0751-40-0194
0751-31-9308 (portion)	0750-29-9342	0750-27-0906
0751-31-0079 (portion)	0750-28-0998 (portion)	0750-27-8925
0750-39-0993	0750-27-4707	
0750-49-5371	0750-27-8677	

Legal descriptions of the properties are based upon surveys, recorded maps, plats, or deeds. This information is all public and provided within the zoning application packet.

#### **Section 4: Purpose Statement**

Horton Park is a proposed mixed-use development that is comprised of single family homes, townhomes, and apartments. The 127.84 acre assemblage is located in an underserved portion of Apex due to the lack of adequate road, water and sewer infrastructure. The PUD parameters are outlined in UDO Section 2.3.4(F)(1)(a)(i - vi) and addressed in various locations within the PD text document which will control the overall Horton Park development as previously described.

The PUD section of the property assemblage is comprised of thirteen (13) parcels, or portions thereof, which total 127.84 acres located along Jessie Drive, west of Smith Road, north of Colby Chase Drive, and east of Middle Creek. The properties are all currently zoned PUD-CZ. The Town of Apex's 2045 Land Use Map designates the properties as Medium Density Residential, High Density Residential, and High Density Residential/Office Employment. An amendment to the 2045 Land Use Map is not required for the current zoning request. Additional information related to the 2045 Land Use Map is provided in Section 18 – 2045 Land Use Map - within the PD Text document and with additional exhibits within the rezoning application.

The purpose of the PUD-CZ rezoning application is to modify conditions agreed to under Zoning #18CZ04. These modifications are summarized below:

1. Modify the timing of off-site roadway improvements to align with major NCDOT and Town of Apex projects including the Ten Ten Road widening; Jessie Drive construction between Ten Ten Road and Highway 55; and Highway 55 corridor improvements from Technology Drive to US 1.
2. Showing portion of PINs 0751-31-0079 and 0751-31-9308 proposed to be removed from the PUD and rezoned to TF-CZ on the official zoning map improves marketability of the site for long-term success.

The higher density residential portion of the property, including apartments and townhomes, will be clustered along Jessie Drive (a major thoroughfare), the North-South Collector Street (a major collector street), and the East-West Collector Street (a major collector street). As the site transitions from north to south, the residential density of Horton Park will reduce and the lot sizes increase. Infrastructure – including roads, water, and sewer – will extend from Smith Road west to the North-South Collector Street and south to Colby Chase Drive in Phase I. Phase II includes the development of the properties clustered along Jessie Drive, including PODs 3 and 4. The extension of the N-S Collector from the Phase I terminus to Jessie Drive is required with development of the adjacent N/F Cash Property (PIN 0751-31-0079) or by the developer of Horton Park PUD per the adopted Transportation Plan. This phasing aligns with the timing of connections of current and future major transportation corridors within NCDOT's and the Town of Apex's long-range plans.



The residential areas, along with the surrounding non-residentially zoned properties, will support the live-work environment which has been stressed by staff and elected officials for years. Greenways will provide pedestrian and bicycle connectivity to surrounding developments, future Apex trail connections, and adjacent municipal connections. In the greenways section of the PD text, the extension of the Middle Creek greenway will be analyzed as discussions have been ongoing with Parks & Recreation staff related to long-term connectivity within the basin.

The transportation systems associated with the project will construct various off-site improvements. Ramey Kemp & Associates has updated the Traffic Impact Analysis with input from NCDOT and Town of Apex staff. Those improvements are clarified in PD Text Section 12 – Public Facilities.

Phasing is covered in Section 17 of the PD Text and in summary, the project expects development to occur in a number of phases, including apartments, townhomes, and single family areas. The final construction phasing will be coordinated with Apex staff during the Master Subdivision Plan and Site Plan design stages. Section 17 provides additional phasing details.

The rezoning of the properties to PUD-CZ in conjunction with the proposed TF-CZ zoning adjacent to this PUD will provide a high quality project for the live-work option in southeast Apex, preserve significant environmentally sensitive areas, provide greenway connections and play lawns, ensure compatibility with the surrounding developments, provide major infrastructure upgrades, and add significant employment zoned areas in southeast Apex.

**Section 5: Permitted Use Table**

The rezoned lands may be used as listed below. The chart provided is a reference to UDO Section 4.2.2 – Use Table – which lists the uses which are permitted within the proposed Planned Unit Development (PUD-CZ).

<b>Horton Park PUD</b>		
<b>Permitted Use Table – PUD-CZ</b>		
"P" permitted; "S" special use permit; " " not permitted; "%" percentage of gross square footage		
Use Type	Residential PODs 3, 5 - 8	High Density Residential POD 4
<b>Residential Uses (UDO 4.3.1)</b>		
Accessory apartment	P	P
Family care home	P	P
Multi-family or apartment		P
Single-family	P	
Townhouse	P	P
Townhouse, detached	P	P
<b>Utilities (UDO 4.3.3)</b>		
Utility, minor	P	P
<b>Recreation Uses (UDO 4.3.4)</b>		
Greenway	P	P
Park, active	P	P
Park, passive	P	P
Recreation facility, private	P	P

**Section 6: Description, Density and Dimensional Standards**

The project is broken down into six (6) PODs, numbered 3-8, to explain the proposed uses, dimensional standards, density and other UDO standards. The PODs are shown on the project exhibit – identified as “EX-1: Proposed Site Exhibit” – included in the rezoning package. The density of the property is identified per POD, access shown per POD, and overall site configuration shown for future roadway extensions.

**\*\* If additional property is included in the project boundary prior to any single family homes or townhomes being occupied in an adjacent POD/Phase, the design buffer may be shifted to the new project boundary in coordination with Apex staff. The design buffer may also be crossed by future public streets based upon review and approval by Apex staff.**

**PODs 3 & 5 Medium/Medium-High**

- POD 3 site area: 4.55 acres
- POD 5 site area: 19.71 acres
- Proposed zoning: PUD-CZ
- Maximum density: Townhomes (6 units / acre) or single family homes (4 units / acre)
  - POD 3 Density: 27 townhomes or 18 single family homes
  - POD 5 Density: 118 townhomes or 78 single family homes
- Maximum building height: 40 feet
- Maximum Built-Upon percentage: 70%

PODs 3 & 5 are proposed for Medium/Medium-High Residential uses, including townhomes, single-family homes, or a mix of products. All development of the residential portions of Horton Park shall submit for Master Subdivision Plan approval through the Town of Apex. Townhomes will be a mix of one (1), two (2), and three (3) bedroom units with various garage and surface parking options to meet current UDO standards (parking standards are referenced in Section 8 of the PD Text).

Individual lot driveway access from POD 5 to the North-South Major Collector Street shall not be permitted.

**Type T-1 Townhomes: front entry units**

- Minimum lot width: 20 feet
- Minimum lot depth: 80 feet
- Front entry townhomes
- Setbacks:
  - o Front setback: 20 feet from R/W
  - o Side setback: 0 feet
  - o Garage setback: 20 feet from back of sidewalk or back of curb where no SW exists
  - o End unit side & corner lot setback: 3 ft
  - o Rear setback: 10 feet

Type T-2 Townhomes: rear or alley entry units fronting on public streets

- Minimum lot width: 20 feet
- Minimum lot depth: 80 feet
- Rear or alley entry townhomes
- Setbacks:
  - o Front setback: 10 feet from R/W
  - o Side setback: 0 feet
  - o End unit side & corner lot setback: 3 ft
  - o Rear setback: 5 feet from alley easement or right-of-way

Type S-1, S-2, S-3, and S-4 single family lots in PODs 3 & 5 shall match the standards established in PODs 6, 7, & 8 within the PD Text document.

Perimeter buffers POD 3 & 5:

All perimeter buffers for PODs 3 & 5 are noted in the table included at the end of Section 6.

**POD 4**                      **High Density Residential**

Site Area:                      20.99 acres

Proposed zoning:            PUD-CZ (Planned Unit Development – Conditional Zoning)

POD 4 is proposed for High Density Residential uses, including apartments, townhomes or a mix of both housing types. The final product will depend upon market conditions as the project progresses. POD 4 will have direct access to Jessie Drive and shall obtain approval from NCDOT and the Town of Apex.

The following parameters will control future apartment and/or townhome development within POD 4 as the required PUD-CZ standards apply:

POD 4 Apartments:

POD 4 site area:                      20.99 acres

Proposed density:                      314 apartments (maximum of 15 units/acre)

Maximum built-upon percentage:    70%

Maximum building height:    65 feet; 4-stories (not including basement level)

Apartments will be a mix of one (1), two (2), and three (3) bedroom units with the option for various parking standards, including surface, garage, and/or basement level parking.

Proposed minimum building setbacks:

- Front, side and rear: 50 feet (perimeter of the apartment site only)

POD 4 Townhomes:

- POD 4 site area: 20.99 acres
- Proposed density: 125 townhomes (max of 6 units/acre)
- Maximum built-upon percentage: 70%
- Maximum building height: 40 feet

If POD 4 is developed as townhomes, there may be a mix of two (2) car garage units, one (1) car garage units, and units without garages. Various types of parking shall be provided to meet current UDO standards (parking standard noted in Section 8 of the PD Text).

Type T-1 Townhomes: front entry units

- Minimum lot width: 18 feet
- Minimum lot depth: 80 feet
- Minimum building separation: 8 feet
- Front entry townhomes
- Setbacks:
  - o Front setback: 20 feet from R/W
  - o Garage setback: 20 feet from back of sidewalk or back of curb where no SW exists
  - o Side setback: 0 feet
  - o End unit side & corner lot setback: 3 ft
  - o Rear setback: 10 feet

Type T-2 Townhomes: rear or alley entry units

- Minimum lot width: 18 feet
- Minimum lot depth: 80 feet
- Minimum building separation: 8 feet
- Rear or alley entry townhomes
- Setbacks:
  - o Front setback: 10 feet from R/W
  - o Side setback: 0 feet
  - o End unit side & corner lot setback: 3 ft
  - o Rear setback: 5 feet from alley right-of-way limits

Perimeter buffers POD 4:

All perimeter buffers for POD 4 are noted in the table included at the end of Section 6.

The project will comply with other standards established by UDO Section 5.1.3 related to setbacks and density requirements or as proposed throughout the rezoning process and noted within the PD Text document.

**PODs 6, 7, & 8 Medium Density Residential**

PODs 6, 7, and 8 are proposed Medium Density Residential uses per Section 5 of the PD text – Permitted Use table.

POD 6	39.01 acres
POD 7	19.37 acres
POD 8	24.21 acres
Total area:	82.59 acres
Proposed density:	227 single family lots (2.75 units / acre – medium density)
Maximum Built Upon Percentage:	70%
Maximum Building height:	40 feet

82.59 acres are proposed within the Medium Density Residential PODs (PODs 6, 7 & 8). The overall lot count for this area has not increased from the previous zoning (case #18CZ04). Single family lots will be a mix of various sizes to create different options for future residents, including:

Type S-1 single family lots

- Minimum lot width: 70 feet
- Minimum lot depth: 100 feet
- Minimum lot size: 7,700 SF
- Average lot size: 8,500 SF
- Lots shall be front, side, or rear entry garage homes
- Proposed minimum setbacks:
  - o Front setback: 15 feet from R/W
  - o Garage setback: 20 feet from back of sidewalk, or back of curb where no SW exists
  - o Side setback: 5' min. (no aggregate)
  - o Corner side setback: 10 feet minimum
  - o Rear setback: 10 feet
  - o Rear entry setback: 5 feet (garage setback for driveway parking standards from alley)

Type S-2 single family lots

- Minimum lot width: 60 feet
- Minimum lot depth: 100 feet
- Minimum lot size: 6,600 SF
- Average lot size: 7,200 SF
- Lots shall be front, side, or rear entry garage homes
- Proposed minimum setbacks:
  - o Front setback: 15 feet from R/W
  - o Garage setback: 20 feet from back of sidewalk, or back of curb where no SW exists
  - o Side setback: 5' min. (no aggregate)
  - o Corner side setback: 8 feet minimum
  - o Rear setback: 10 feet
  - o Rear entry setback: 5 feet (garage setback for driveway parking standards from alley)

Type S-3 single family lots

- Minimum lot width: 50 feet
- Minimum lot depth: 100 feet
- Minimum lot size: 5,500 SF
- Average lot size: 6,000 SF
- Lots shall be front, side, or rear entry garage homes
- Building setbacks:
  - o Front setback: 10 feet from R/W
  - o Garage setback: 20 feet from back of sidewalk, or back of curb where no SW exists
  - o Side setback: 5' min. (no aggregate)
  - o Corner side setback: 5 feet
  - o Rear setback: 5 feet
  - o Rear entry setback: 5 feet (garage setback for driveway parking standards from alley)

Type S-4 single family lots

S-4 single family lots are not permitted in POD 8 and are only permitted along the collector streets within POD 6 and 7.

- Minimum lot width: 40 feet
- Minimum lot depth: 100 feet
- Minimum lot size: 4,000 SF
- Average lot size: 4,500 SF
- Front entry units may have 1 car garage or no garage for each unit
- Rear entry units may have 2 car garage for each unit
- Building setbacks:
  - o Front setback: 10 feet from R/W
  - o Garage setback: 20 feet from back of sidewalk, or back of curb where no SW exists
  - o Side setback: 5' min. (no aggregate)
  - o Corner side setback: 5 feet
  - o Rear setback: 5 feet
  - o Rear entry setback: 5 feet (garage setback for driveway parking standards from alley)

Perimeter buffers PODs 6, 7 & 8:

All perimeter buffers for PODs 6, 7 & 8 are noted in the table included at the end of Section 6.

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<b>Horton Park PUD Proposed Buffer Table</b>				
POD #	North	East	South	West
3	20' Type B	20' Type B	30' Type B (50' Type A/B if disturbed per UDO)	20' Type B
4	30' Type B (50' Type A/B if disturbed per UDO)	25' Type B-residential and landfill	25' Type B – stream buffer next to landfill	0' - adjacent to gas easement
5	20' Type B	25' Type B–next to landfill 0' between POD 5&6	10' Type A-major collector * (type 'D' for alley loaded)	20' Type B
6	25' Type B – landfill 20' Type B- residential	20' Type B	10' Type A-major collector * (type 'D' for alley loaded) 20' Type B-residential 30' Type B-Beck property	0' - adjacent to gas easement
7	10' Type A-major collector *	10' Type D-collector OR 20' Type B-residential	None; internal to project (stream buffer)	10' Type B-floodplain
8	0' – internal 20' Type B-residential	20' Type B-stream buffer 20' Type B – residential 10' Type B – eastern boundary of Virginia Horton Stewart property	10' Type B-Colby Crossing & stream buffer	10' Type B floodplain

Buffers along roads shall be provided as shown on Sheet EX-1 or the PUD Plan Sheet Packet. Per UDO 8.2.6, within residential developments, no streetfront buffer is required on minor collectors or residential streets.

\* Where alley-loaded homes face a major collector, a Type 'D' buffer shall be required.



### **Section 7: Architectural Standards**

The following Architectural Standards shall apply for the multi-family/apartments, townhomes and single family homes as applicable to the following sections.

#### Apartment standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. Siding materials shall be varied in type and/or color on 30% of each façade on each building.
3. Windows must vary in size and/or type.
4. Windows that are not recessed must be trimmed.
5. Recesses and projections shall be provided for at least 50% of each façade on each building.
6. Rooflines cannot be a single mass; they must be varied with the use of gables or parapets.
7. Garage doors must have windows, decorative details or carriage-style adornments.
8. At least three of the following decorative features shall be used on each building:
  - Decorative shake
  - Board and batten
  - Decorative porch railing/posts
  - Shutters
  - Decorative/functional air vents on roof or foundation
  - Recessed windows
  - Decorative windows
  - Decorative brick/stone
  - Decorative gables
  - Decorative cornices
  - Tin/metal roof
9. A varied color palette shall be utilized for the apartment buildings throughout the development. With garden style apartments, a minimum of three color families for siding shall be provided and will include varied trim, shutter, and accent colors complementing the siding color. For a single mass apartment structure, the color shall vary with accent colors or architectural features to provide building relief.
10. Breezeway(s) for the four story apartment elevation is to be enclosed for additional mechanical equipment or elevators.

#### Townhome standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. All townhomes shall have a crawl space or raised foundation which at a minimum rises at least 12 inches from average grade across the front of the house to the finished floor level at the front door.
3. Roofline cannot be a single mass; it must be broken up horizontally and vertically between units.
4. Garage doors must have windows, decorative details or carriage-style adornments.
5. House entrances for units with front-facing single-car garages shall have a prominent covered porch/stoop area leading to the front door.
6. The garage cannot protrude more than 1 foot out from the front façade or front porch.
7. The visible side of a townhome on a corner lot facing the public street shall contain at least 2 decorative elements such as, but not limited to, the following elements:
  - Windows
  - Bay window
  - Recessed window
  - Decorative window
  - Trim around the windows
  - Wrap around porch or side porch

- Two or more building materials
  - Decorative brick/stone
  - Decorative trim
  - Decorative shake
  - Decorative air vents on gable
  - Decorative gable
  - Decorative cornice
  - Column
  - Portico
  - Balcony
  - Dormer
8. Building facades shall have horizontal relief achieved by the use of recesses and projections.
  9. A varied color palette shall be utilized on homes throughout the subdivision to include a minimum of three color families for siding and shall include varied trim, shutter, and accent colors complementing the siding color.
  10. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.
  11. Minor elevation adjustments may be accommodated with staff approval – including limiting clipped dormers on no more than 25% of the proposed townhome building designs.
  12. Side entry, end unit townhomes in highly visible locations shall provide a covered entry feature for each unit. Highly visible locations shall include the end of a series of buildings, and adjacent to public or private rights-of-ways, recreation areas, open space, buffers, or adjacent properties.

Single-family residential standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. All single-family homes shall have a crawl space or have a raised foundation which at a minimum rises at least 20 inches from average grade across the front of the house to the finished floor level at the front door.
3. Garage doors must have windows, decorative details or carriage-style adornments.
4. The garage cannot protrude more than 1 foot out from the front façade or front porch.
5. The roof shall be pitched at 5:12 or greater for 50% of the building designs.
6. Garages on the front façade of a home that faces the street shall not exceed 40% of the total width of the house and garage together.
7. Eaves shall project at least 12 inches from the wall of the structure.
8. The visible side of a home on a corner lot facing the public street shall contain at least 3 decorative elements such as, but not limited to, the following elements:
  - Windows
  - Bay window
  - Recessed window
  - Decorative window
  - Trim around the windows
  - Wrap around porch or side porch
  - Two or more building materials
  - Decorative brick/stone
  - Decorative trim
  - Decorative shake
  - Decorative air vents on gable
  - Decorative gable
  - Decorative cornice
  - Column
  - Portico
  - Balcony
  - Dormer
9. A varied color palette shall be utilized on homes throughout the subdivision to include a minimum of three color families for siding and shall include varied trim, shutter, and accent colors complementing the siding color.

10. House entrances for units with front-facing single-car garages shall have a prominent covered porch/stoop area leading to the front door.
11. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.
12. Front porches shall be a minimum of 6 feet deep.
13. No more than 25% of lots may be accessed with J-driveways. There shall be no more than 3 such homes in a row on any single block. Any lots eligible for a J-driveway home shall be identified on the Final Plat.
14. A maximum of 100% of the single family detached residential units within POD 6 shall be permitted as “zero-entry” homes without the 20 inch rise from average grade across the front of the property to the finished floor elevation. All “zero-entry” homes shall also provide first floor master bedrooms. Lots permitted as “zero-entry” shall be noted on the Final Plat.
15. All single family detached residential homes are to be pre-configured with conduit for a solar energy system.
16. No less than 10 single family detached homes out of the first 100 homes within POD 6 will be installed with a minimum of a 4 kW solar PV system.

### **Section 8: Parking and Loading**

Parking will be provided for each product type in accordance with Apex UDO Section 8.3 standards or as noted below.

#### Apartments:

Parking shall be provided by surface, garage, underground parking, or a mix of parking types. Parking shall be provided per UDO Section 8.3 standards in conjunction with staff reviews.

#### Townhomes:

Townhome parking shall be provided pursuant to standards established in Section 8.3 of the UDO with the following clarification:

- 2 parking space/townhome required, including garage or driveway spaces, plus
- 0.50 parking spaces/bedroom over 2 bedrooms/unit, plus
- 0.25 parking spaces/unit for guest spaces
- Garages and driveways shall be counted for overall parking standards if they meet dimensional standards

#### Single Family detached:

Parking for single family homes will be provided in garages and concrete driveways on each lot which meet Apex UDO standards. CBU or Mail Kiosk parking shall be calculated per UDO Section 8.3 standards and provided around the appropriate device.

Residential driveways shall have a minimum width of 12’ and 20’ in length as measured from the back of the sidewalk or, where no sidewalk exists, a minimum of 20’ as measured from the back of the curb, to count as required parking.

### **Section 9: Resource Conservation Area (RCA)**

Horton Park PUD (127.84 acres) is located north and east of 540 and is therefore required to meet the standards of UDO Section 8.1.2 to preserve or establish a minimum of 20% Resource Conservation Area (RCA) for the project. The project is proposing to mass grade the single-family portions of the project and is therefore required to provide an additional 2% RCA for the single family, mass graded sections. The project will provide an overall RCA of no less than 20% (25.568 acres) of the project's total gross acreage if the site is stage-graded, with an additional 2% RCA for any single family sections within Horton Park which are mass graded.

With large portions of floodplain along the western boundary of the site, development patterns may adjust to accommodate required RCA standards. RCA for the project may include stream buffers, floodplains, wetlands, steep slope areas, perimeter buffers, street and roadway buffers, a portion of storm water devices, community amenity areas, play lawns and other designated areas. The final location and calculations for RCA shall be finalized during the Master Subdivision Plan and Construction Document reviews.

### **Section 10: Landscaping**

Internal landscaping will comply with various UDO sections including Section 8.2 for buffers, street tree plantings, foundation plantings, and tree preservation (as proposed) or as noted within Section 6 of the PD Text or as shown on EX-1: Proposed Site Exhibit attached with the rezoning request. With the variety of uses in and around the property, variable width and variable opacity buffers will be provided throughout the project.

The residential buffers will follow UDO standards for perimeter plantings, Jessie Drive frontage (thoroughfare), collector streets, and residential properties adjacent to developed or undeveloped property. Proposed buffers are labeled within Section 6 – Description, Density, and Dimensional Standards for each POD and shown on Exhibit 1 to assist in the identification of the buffer classifications.

### **Section 11: Signage**

All signage will comply with the applicable standards and requirements of UDO Section 8.7.

Signage for the residential developments, whether apartments, townhome or single family PODs, shall be coordinated with staff during the appropriate Master Subdivision Plan and/or Master Signage Plan approval. Each section of the development will provide sign easements along perimeter street infrastructure for appropriate signage.

### Section 12: Public Facilities

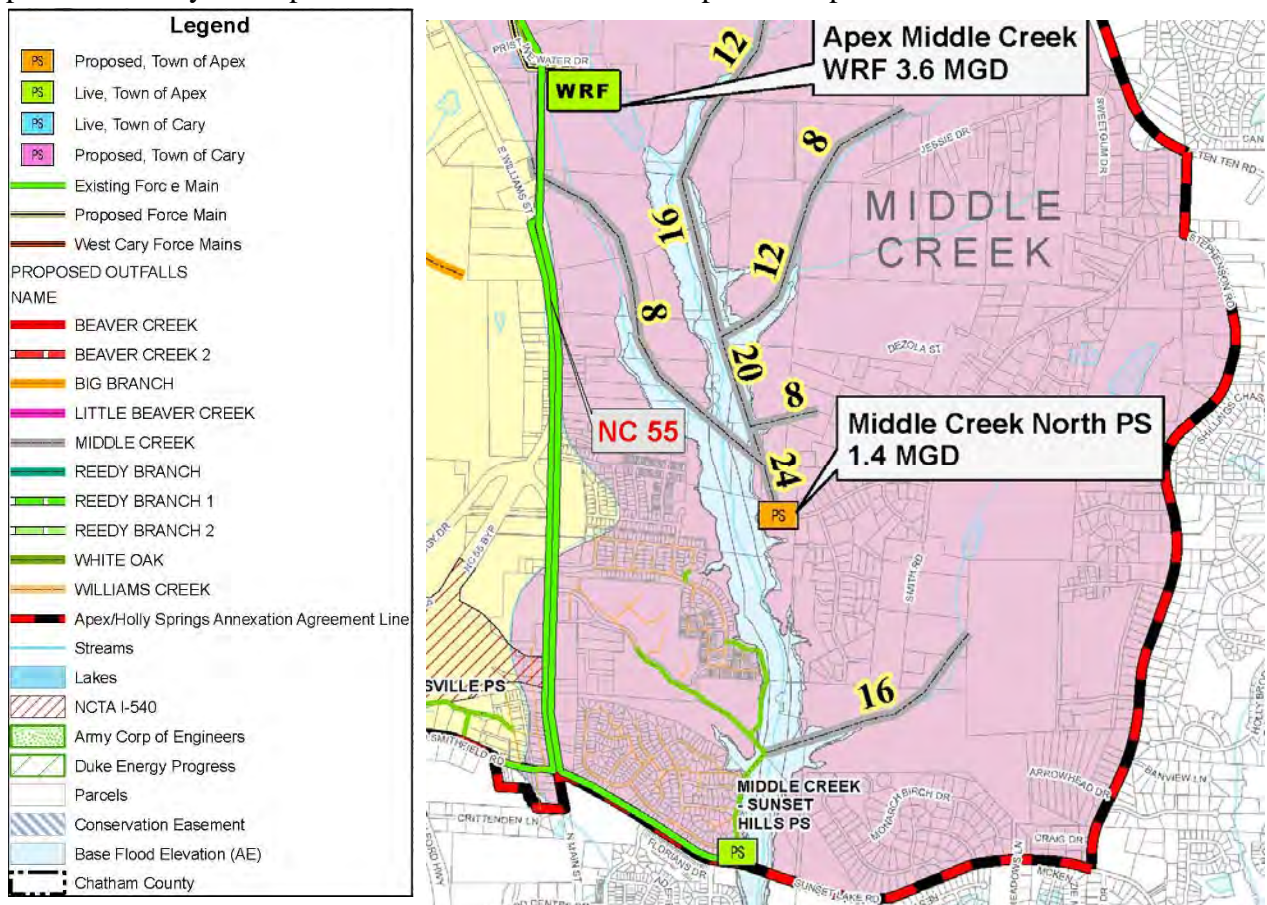
The project’s construction will consist of the extension of public facilities to serve the site. All public facilities and infrastructure shall be designed per the current Town of Apex standards and specifications. Facilities include:

#### Water

Water will be extended from Pemberley subdivision (south) and Smith Road (east) for Phase I; and from Jessie Drive (north) for Phase II. Various extensions will be provided within the Horton Park phasing study to confirm sufficient pressure and flows to all portions of the project during any phased portion of the development.

#### Sanitary Sewer

The Middle Creek North Pump Station is proposed to provide sanitary sewer service to the Middle Creek drainage basin north of Colby Chase Drive. This pump station will be constructed by the development team, including design, land acquisition, construction, and commissioning. Costs associated with the pump station will be reimbursed through separate developers’ agreements with the Town of Apex that are outside the scope of the PUD process. The new regional pump station is required as the existing Middle Creek – Sunset Hills pump station is currently at capacity and cannot accept significant flows from development within the Middle Creek drainage basin. This new pump station will alleviate capacity concerns for the existing pump station and provide a public sewer system option for Horton Park and other parts of Apex.



### Streets

A number of future collector streets and a future 4-lane thoroughfare are shown on the Apex Transportation Plan – Thoroughfare and Collector Street Map within the boundary of the PUD. These streets include Jessie Drive (major thoroughfare); an east-west major collector (within the vicinity of Dezola Street); an east-west minor collector (connection from Percussion Drive to the north-south connector); a north-south minor collector (Colby Chase Drive to the east-west major collector), and a north-south major collector from the east-west major collector to Jessie Drive). The final alignment of any collectors or thoroughfares will be coordinated with staff during the Master Subdivision Plan or Site Plans. The ultimate right-of-way for each of the collectors and thoroughfares shall be provided during the time of Master Subdivision Plan review. The roadway sections which are installed are based upon the traffic capacity evaluations, the Traffic Impact Analysis, standards, and discussions with staff at the time of submittal of the Horton Park design documents. Modifications to the alignment of the collectors and thoroughfares will be reviewed with staff at the appropriate time to ensure compliance with Town standards that certain connections are made. The final alignment of all streets shown within the Master Subdivision Plans will be coordinated with staff.

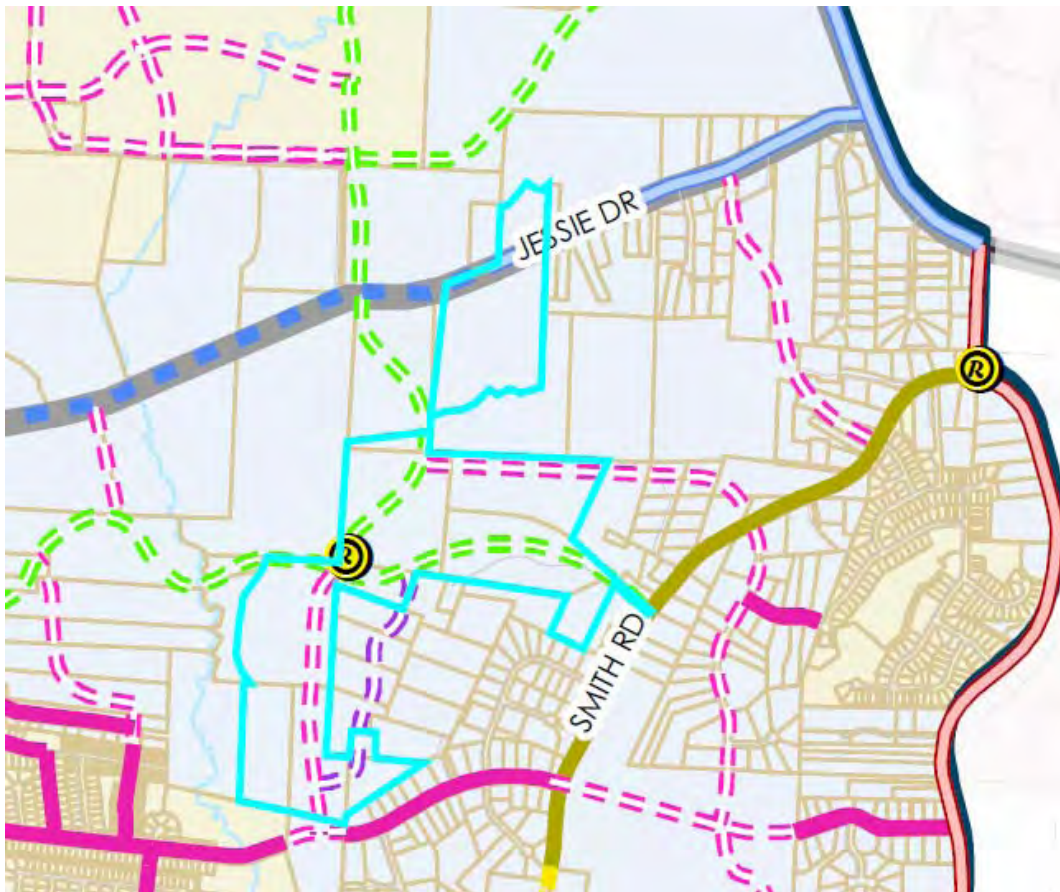


Figure 1 – Apex  
Transportation Map  
PUD outlined in Cyan

### Transportation:

Following are the Traffic Capacity Zoning Conditions for the project pursuant to the MOU dated June 21, 2019 coordinated between NCDOT, the Town of Apex Transportation Engineering staff, and the project Transportation Engineer (Ramey Kemp & Associates).

The Developer shall coordinate with NCDOT all planned improvements on state maintained roadways. In some cases, zoning conditions are subject to NCDOT review and approval and may change to conform to NCDOT approvals. Turn bay storage lengths refer to the length of full width lane provided exclusive of the 100-foot taper in each case. Jessie Drive shall continue as a state maintained roadway for all existing and proposed sections, and the developer shall dedicate the right-of-way pursuant to the current Town of Apex Transportation Plan, currently a 110-foot public right of way along all sections of Jessie Drive within the development.

The timing of the roadway improvements will be coordinated with Apex Transportation Staff during the Master Subdivision Plan and Construction Document review based upon the recommendations within the approved Traffic Impact Analysis (TIA) and according to the phasing plan provided in Section 17 - Phasing. The following recommendations are based upon the revised TIA which will supersede the TIA dated May 31, 2017, the Colby Chase Addendum dated August 30, 2017, and the TIA Update date July 2, 2019.

## **PHASE I TRANSPORTATION IMPROVEMENTS**

### US 1 Southbound Ramps / Waterford Green Drive at Center Street

- The Developer shall coordinate with NCDOT and Town staff in order to conduct a signal timing study and implement traffic signal timing modifications within the scope of the closed loop-system for Center Street/Ten-Ten Road, including this intersection, Lufkin Road and Reliance Avenue. The developer shall be obligated to pursue this effort only once during the development build-out schedule as directed by the Town of Apex Senior Transportation Engineer.
- The Developer shall provide intersection signal timing evaluation and modifications at a time to be determined by the Town of Apex Senior Transportation Engineer within the following schedule: The timing evaluation shall occur after the first Final Plat is recorded and prior to the recordation of the Final Plat for no more than 250 dwelling units of single-family and/or townhomes, or the issuance building permits for 250 apartment units, or any combination thereof.

### Ten Ten Road at Smith Road

- The Developer shall extend the existing westbound left-turn lane to provide a minimum of 350 feet of storage and appropriate taper.
- The Developer shall construct the aforementioned improvements at the Ten Ten Road/Smith Road intersection at the time the East-West Collector Street is constructed and platted to Smith Road.

#### Smith Road at Stephenson Road/Smith Road

- The Developer shall construct an eastbound left-turn lane with a minimum of 100 feet of storage and appropriate taper.
- The Developer shall monitor this intersection for installation of all-way stop control and provide for the all-way stop conversion if warranted and permitted by NCDOT.
- The Developer shall construct the aforementioned improvements at the Smith Road/Stephenson Road intersection at the time the East-West Collector Street is constructed and platted to Smith Road.

#### Smith Road at East-West Collector Street

- The Developer shall construct a southbound right-turn lane with a minimum of 100 feet of storage and appropriate taper.
- The Developer shall construct a Major Collector Street from the North-South Collector Street to Smith Road on a 60-foot public right of way for the entire length.
- The Developer shall provide access to existing residential properties on Dezola Street in a manner that avoids residential driveways directly accessing any Major Collector Streets.

#### East Williams Street at Straywhite Avenue

- The Developer shall stripe the Straywhite Avenue approach to E. Williams Street for two lanes with 75 feet of storage.
- The Developer shall monitor the intersection and install a traffic signal if warranted and permitted by NCDOT.
- The Developer shall complete the monitoring period as directed by the Town of Apex Senior Transportation Engineer within the following schedule: The monitoring shall occur after the opening of Colby Chase Drive from the Pemberley subdivision to the Merion Subdivision but no later than the recording of the Final Plat for 250 dwelling units of single-family and/or townhomes, or the issuance of building permits for 250 apartment units, or any combination thereof.

#### East Williams Street at Technology Drive at NC 55

- Intersection included in the MOU. No improvements warranted per TIA.

#### North-South Collector Street

- The Developer shall construct the portion of the North-South Collector Street from Colby Chase Drive to the PUD boundary at the southern creek on N/F Cash Property (PIN 0751-31-0079) to a Minor Collector Street typical section on a 60-foot public right-of-way.



## **PHASE II TRANSPORTATION IMPROVEMENTS**

The full project build-out includes the following intersections per the approved MOU.

### **Jessie Drive at Ten-Ten Road**

- The Developer shall construct a westbound left-turn lane with a minimum of 100 feet of storage and appropriate taper prior to the pending state TIP project.
- The Developer shall construct an eastbound right-turn lane with a minimum of 200 feet of storage and appropriate taper prior to the pending state TIP project.
- The Developer shall construct a northbound right-turn lane with 100 feet of storage and appropriate taper prior to the pending state TIP project.
- The Developer shall monitor this intersection and install a traffic signal if warranted and permitted by NCDOT prior to the pending state TIP project.
- The Developer shall construct the improvements at the aforementioned Jessie Drive/Ten Ten intersection at the time Jessie Drive is extended to the Horton Park North-South Collector/Production Drive intersection.
- If the traffic signal is not warranted prior to the first Final Plat, the developer shall provide a performance bond for the signal based on an engineer's estimate of final costs. The performance bond shall remain in place for a period of 5 years, or until the last Final Plat for the development, whichever comes first. Once the signal is warranted, the developer shall install the signal within 6 months plus time for any delays due to right-of-way acquisition and utility relocation but not to exceed 12 months.

### **Jessie Drive at the North-South Collector Street**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions at both intersections.
- The Developer shall construct the portion of the North-South Collector Street from the PUD boundary on the N/F Cash property (PIN 0751-31-0079) to Jessie Drive to a Major Collector Street typical section on a 60-foot public right of way.
- The Developer shall construct the aforementioned improvements prior to recordation of the first Final Plat for single-family and/or townhomes, or the issuance of the first building permit for apartments within Phase II of the development.

### **Jessie Drive at Site Drive #1 (POD 3 & 4)**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions.

### **Jessie Drive at Site Drive #2 (POD 4)**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and free-flow eastbound and westbound approaches with 100-foot left turn lanes both directions.

**The following roadway improvements are internal to the project and do not require NCDOT review or approval. These improvements shall be reviewed with Apex staff to verify compliance with design standards during the zoning, master subdivision, and construction document stages of the project as appropriate. Improvements shall be constructed and platted as the connections are created for each development POD. Said improvements were identified within the Traffic Impact Analysis dated May 31, 2017 with the Colby Chase Addendum dated August 30, 2017 with no proposed modifications.**

**North-South Collector Street at Site Drive #2, #3, and Dezola Street**

- The Developer shall construct single lane eastbound and westbound approaches with stop control, and single lane northbound and southbound free-flow approaches.

**East-West Collector Street at Site Drive #4**

- The Developer shall construct single lane northbound and southbound approaches with stop control, and single lane eastbound and westbound free-flow approaches. Stop control may be reversed subject to future connectivity.

**North-South Collector Street at Colby Chase Drive**

- The Developer shall construct the connection of Colby Chase from Pemberley Subdivision to the Merion Subdivision. The connection of Colby Chase Drive to the state-maintained portion requires NCDOT review and approval.
- The Developer shall construct the connection of the North-South Collector Street to Colby Chase Drive.
- The Developer shall evaluate with Apex staff the option for traffic calming devices along Colby Chase Drive between Pemberley and Merion subdivisions.

**Colby Chase Drive Extension**

- The Developer agrees not to open Colby Chase Drive to the Merion Subdivision until the North-South Collector Street is constructed and open to the public or at the direction of the Town of Apex Senior Transportation Engineer.

### Sidewalks

Sidewalks will be installed in accordance with the UDO standards along all streets within the residential development and along the public rights-of-ways.

### Greenways

Greenways and multi-use paths will be provided within the development per the PRGOS Master Plan and as an additional project amenity. Location of said greenways and multi-use paths is being and will continue to be coordinated with staff through the rezoning process and future MSPs. Additional detail will be provided at the appropriate time including the Parks & Recreation Advisory Commission meeting, MSP review and construction document submittals. Additional information is contained in Section 16 – Parks & Recreation.

## **Section 13: Pedestrian Circulation System and Amenities**

The pedestrian circulation system will include sidewalks along internal streets, perimeter roadways, Jessie Drive, Dezola Street and other named and unnamed collectors, residential streets, alleys or as appropriate in discussion with staff for each Phase of the project. Various greenways and multi-use paths are shown within the Apex Master Plans and will be coordinated with staff for the design and installation as appropriate during Master Subdivision Plan review.

The developer has agreed to work with staff to find a location which can accommodate a future transit easement along Jessie Drive for Phase II of the project. Any final agreements and location shall be coordinated during the design of Jessie Drive. This commitment is not a commitment to construct – this is a commitment to work with staff to find an appropriate location only.

## **Section 14: Natural Resources and Environmental Protection**

The site is located within the Town's Secondary Watershed Protection Overlay District including Middle Creek and the large floodplain associated with this feature. This part of Apex is currently undeveloped and has a number of creeks and streams containing a large amount of wetlands, floodplains, stream buffers and other environmentally sensitive areas. The site is shown within Specials Flood Hazard areas as identified by FEMA FIRM Maps 3720075100J and 3720075000J dated May 2, 2006.

Impacts to some of these environmentally sensitive areas will be unavoidable during the design and permitting for the project. Impacts will be identified and permitted through the appropriate local, State and/or Federal review agencies as required for construction of the project. Major creek crossings will be required and adjusted to minimize environmental impacts associated with the development.

A full review of the flora, fauna, endangered species, and historical data has been completed and all areas identified within the previously approved Master Subdivision Plans. Environmentally sensitive areas and impact maps have been prepared through the rezoning, Master Subdivision Plan, and construction documents for impacts. The creeks, streams, and buffers which are currently shown were provided by S&EC, Inc. and from the current USGS map and Wake County soils

survey. An onsite review with the US Army Corps of Engineers and NC-DNR has been completed. Any additional buffers or streams have been coordinated with NCDWR staff and the site adjusted per the final concurrence calls. Immediately adjoining land uses would extend into the newly available development area with additional building square footage or additional lots not to exceed the zoning approval conditions.

Based upon the North Carolina State Historic Preservation Office website (HPOWEB GIS Service) and Apex UDO Section 12.2 – Historic Structures – there are no historic homes or contributory structures within the boundary of the properties.

### **Section 15: Storm Water Management**

The project will contain a number of proposed storm water SCMs. The site is located within the Middle Creek basin and Apex’s Secondary Watershed Overlay District and is therefore required to meet the standards of UDO Section 6.1 as applicable. Horton Park will utilize approved structural devices to control storm water and sediment runoff including detention ponds, retention ponds, bioretention cells, wetlands, underground devices, and/or other State recognized storm water management devices. Storm water control devices shall blend into the surrounding developments or be used as possible amenities depending upon their design, aesthetics, size, and location. Final routing of the SCMs will be done in conjunction with the Apex Environmental Services staff to assure compliance with appropriate guidelines.

### **Section 16: Parks and Recreation**

The Parks, Recreation, Greenways and Open Space Master Plan shows the development of the Middle Creek greenway from the Holly Springs greenway system at Sunset Lake Road extending north to Lufkin Road Middle School and the Town of Cary’s greenway system north of Ten Ten Road. The greenway and multi-use paths shall be a mix of asphalt, concrete, sidewalk, boardwalk, and pedestrian bridges which will be identified with Apex staff during the Master Subdivision Plan review. Horton Park has been in discussions with Parks & Recreation staff to determine the best routing to serve the most residents and possible commuters as practical. This routing would involve greenways along Middle Creek, unnamed creeks and streams, floodplain boundaries and other natural areas as well as multi-use paths along residential streets, minor collectors, and major collectors.

Horton Park was reviewed at the August 30, 2017 PRCR Advisory Commission meeting and was approved consistent with Staff’s recommendation for a fee-in-lieu for the project with the flexibility for both parties to continue to work to find a way to implement the Middle Creek Greenway plan. In the event a solution can be reached, which may involve adjusting the corridor, the developer would build the connection and receive credit against the fees owed. All other sections of the UDO pertaining to the construction of public greenway would then be applicable.

A Public Art Easement shall be provided at the intersection of Jessie Drive and the North-South Collector with a second location within the roundabout at the intersection of the North-South Collector and the East-West Collector streets.

## **Section 17: Phasing**

### Lot Development Phasing:

The project will consist of as many as seven (7) development phases. These phases will be broken into the following categories, although development will vary in timing and order of POD development based upon market conditions and off-site roadway improvements at the time of approval:

1. one (1) phase of single-family and/or townhomes north of Jessie Drive (POD 3);
2. one (1) phase of townhomes and/or apartments south of Jessie Drive (POD 4);
3. two (2) townhome phases south of Jessie Drive (POD 5); and
4. three (3) medium density, single family phases south of Jessie Drive to Colby Chase Drive and east to Smith Road (PODs 6, 7 & 8).

The development of Horton Park will also be broken down into two (2) larger phases – as identified in the Traffic Impact Analysis (TIA). The two phases within the TIA are described as:

#### Phase I:

Phase I includes the development of all single-family residential lots and townhome lots south of the PUD boundary located along the creek on the southern portion of the N/F Cash Property (PIN 0751-31-0079). This includes PODs 5 – 8, the East-West Major Collector Street from Smith Road to the western project boundary and the North-South Collector Street from Colby Chase Drive to the boundary of the PUD located along the creek on the southern portion of the N/F Cash Property (PIN 0751-31-0079).

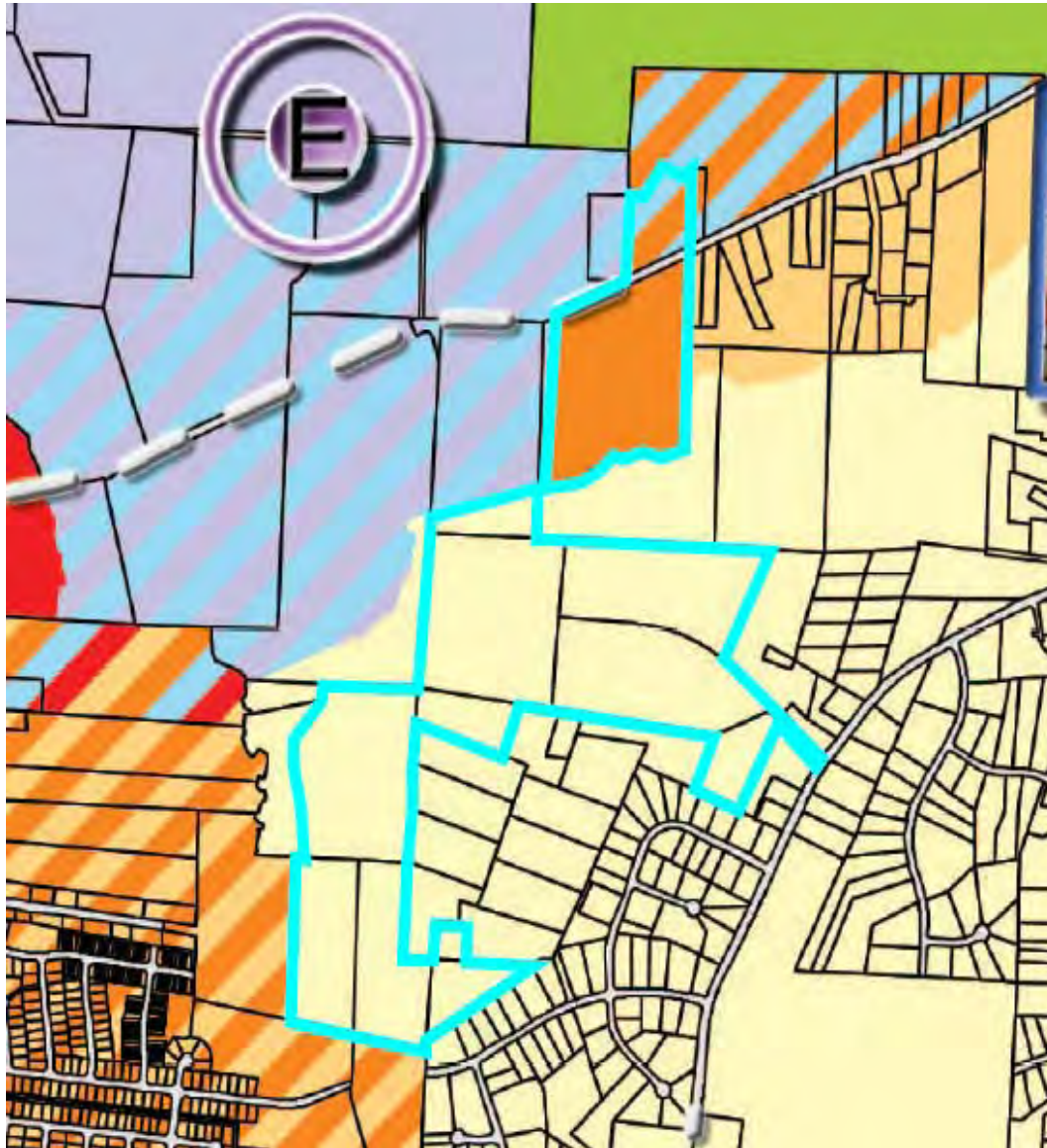
#### Phase II:

Phase II includes the development of the single-family, townhomes, and/or apartments along the Jessie Drive corridor. This specifically includes PODs 3 and 4. Phase II also includes the construction of the North-South Major Collector from the Phase I terminus to Jessie Drive; and the construction of Jessie Drive from the current terminus to the North-South Major Collector Street.

## **Section 18: 2045 Land Use Map**

The Horton Park PUD development encompasses 127.84 acres of property including multiple residential types (PODs 3-8). The rezoning request is in keeping with the land use designations identified on the current 2045 Land Use Map. The 2045 Land Use Map has been included for reference in this section although there are no requested changes.

NO CHANGES TO THE CURRENT 2045 LAND USE MAP ARE PROPOSED WITH THE HORTON PARK REZONING.



2045 Land Use Map Boundary of PUD-CZ district is shown in CYAN.

**Future Land Classifications**

-  Protected Open Space
-  Rural Density Residential  
One dwelling unit per five acres
-  Low Density Residential  
Single-family homes or a mix of single-family homes with duplexes and/or townhomes
-  Medium Density Residential  
Single-family homes, duplexes, and townhomes
-  Medium/High Density Residential  
Single-family homes, duplexes, triplexes, quadplexes, and townhomes\*
-  High Density Residential  
Townhomes, triplexes, quadplexes, and apartments
-  Office Employment
-  Commercial Services
-  Industrial Employment
-  Park—Public or Private
-  School
-  Sanitary Landfill
-  Right-of-Way
-  Mixed Use  
80% Non-residential
-  Property Lines
-  Duke Energy Land
-  Proposed Thoroughfares

\*Apartments allowed within the Town Center and Transit-Oriented Development context areas

**Potential Activity Centers**

-  **Neighborhood Mixed Use (NMU)**  
Economic development potential estimated to be, but not limited to:  
• Up to 100,000 ft<sup>2</sup> of commercial  
• 1 to 2-mile trade area
-  **Employment Mixed Use (EMU)**  
Economic development potential estimated to be, but not limited to:  
• Office, warehousing, tech/flex  
• Same commercial
-  **Community Mixed Use (CMU)**  
Economic development potential estimated to be, but not limited to:  
• Up to 350,000 ft<sup>2</sup> of commercial  
• 4 to 6-mile trade area
-  **Regional Mixed Use (RMU)**  
Economic development potential estimated to be, but not limited to:  
• Over 350,000 ft<sup>2</sup> of commercial  
• 10 to 25-mile trade area
-  **Recreational Mixed Use (XMU)**  
Economic development anchored by a recreational amenity  
• Size of businesses and services dependent upon amenity size  
• Pedestrian and bicycle mobility preserved

### **Section 19: Compliance with the Unified Development Ordinance**

With any specific items previously identified within the PD Text addressed, the project – including the Residential Master Subdivision Plans, non-residential Site Plans, and Construction Documents – shall comply with the applicable Apex Unified Development Ordinance sections. Any deviation from these standards shall be approved by staff, Planning Board or Town Council representatives through the design and approval for the project as appropriate.

## **EXHIBITS**

The following exhibits/drawings are attached as part of the required PUD-CZ. Any reference to the LI-CZ parcels is for information purposes only and does not constitute control or additional standards on the LI-CZ parcel.

### **COVER SHEET (Sheet C000)**

The Cover Sheet contains contact information, a vicinity map, the site design guidelines and required Town of Apex site notes and descriptions.

### **EXISTING CONDITIONS (Sheet C001)**

The C001 Existing Conditions sheet is the overall boundary of the property including land owners, property line calls, creek data, adjacent property owner's information, land uses, PIN reference, deed and/or plat information, and surrounding roadway networks.

### **EXISTING CONDITIONS - TOPO (Sheet C002)**

The C002 Existing Conditions sheet includes the data on sheet C001 along with LIDAR topographic information referenced into the drawing.

### **EXISTING CONDITIONS – TREE SURVEY (C003)**

The C003 Tree Survey sheet contains the location, size and tree data. The trees were identified per requirements of UDO Section 8.1.2(B)(2) including perimeter site locations, anticipated RCA, and a general notation for internal tree samplings. This information was provided by Ellen & Associates, registered NC forester #565.

### **CONCEPTUAL SITE PLAN (Sheet C100)**

The Conceptual Site Plan includes the required base items per the PUD checklist, standard site notes, access points, existing street network, and identification of specific uses. The townhome and apartment areas, as well as the single family residential areas, are all identified on the plan. Items to point out are the locations of Jessie Drive, the gas easement and creek locations based upon surveys, LIDAR and FEMA mapping information.

### **CONCEPTUAL UTILITY PLAN (Sheet C200)**

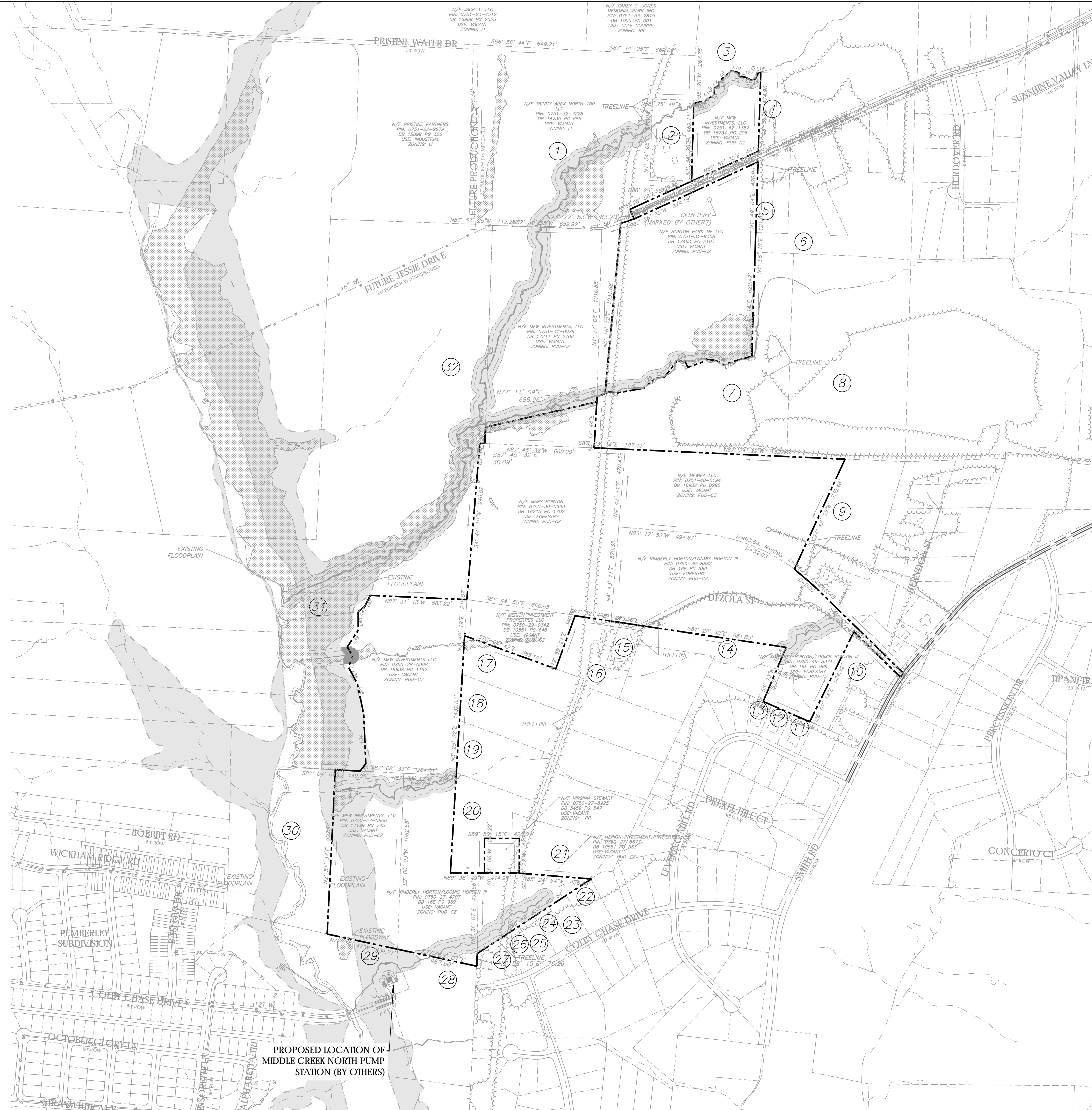
The Conceptual Utility Plan shows the location of existing water and sewer infrastructure in the area. Although there is no sewer in the area, we have still set up the drawing to reflect existing conditions and location of the connections and Middle Creek North Pump Station.

### **PROPOSED SITE EXHIBIT (Sheet EX-1)**

The Proposed Site Exhibit shows the location of the different uses within the project boundary. This includes; high density residential (townhomes and/or apartments); medium/high density residential (townhomes); and medium density residential (single family homes). Each section is broken into PODs for each use and summarized in the PD Text document.







**NOTES:**

1. THERE ARE NO CONTRIBUTING HISTORICAL STRUCTURES WITHIN THE PROJECT BOUNDARY.
2. SUBJECT PROPERTIES KNOWN AS PARCEL IDENTIFICATION NUMBERS, AS SHOWN ON SHEET C000.
3. ALL OFF-SITE EASEMENTS SHALL BE ACQUIRED BY THE DEVELOPER AND THESE OFF-SITE EASEMENTS SHALL BE RECORDED BY A DEED OF EASEMENT PRIOR TO UTILITY INFRASTRUCTURE CONSTRUCTION APPROVAL. THESE EASEMENTS SHALL BE DEDICATED TO THE TOWN OF APEX AND LABELED "TOWN OF APEX PUBLIC UTILITY EASEMENT".
4. NO PERSON SHALL PLACE ANY PART OF A STRUCTURE, ANY PERMANENT EQUIPMENT, OR IMPOUNDMENT UPON TOWN OF APEX PUBLIC UTILITY EASEMENTS. PROHIBITED STRUCTURES INCLUDE, BUT ARE NOT LIMITED TO: BUILDINGS, HOUSES, AIR CONDITIONING UNITS, HEAT PUMP UNITS, DECKS, GARAGES, STORAGE/TOOL SHEDS, SCREENS, SWIMMING POOLS, WALLS, RETAINING WALL MECHANISMS/APURTENANCES AND FENCES, UPON PRIOR WRITTEN APPROVAL BY THE PUBLIC WORKS DEPARTMENT. FENCES MAY PERMITTED ACROSS EASEMENTS, PROVIDED THAT AN ACCESS GATE IS INSTALLED FOR THE FULL WIDTH OF THE EASEMENT.
5. NO PERSON SHALL PLANT TREES, SHRUBS, OR OTHER PLANTS WITHIN A TOWN OF APEX PUBLIC UTILITY EASEMENT WITHOUT PRIOR WRITTEN APPROVAL FROM THE PUBLIC WORKS DEPARTMENT.
6. ANY AND ALL STREET SIGNS SHALL ONLY BE PROVIDED AND INSTALLED BY THE TOWN OF APEX.
7. THE PROPERTY SHOWN HEREON IS IN THE TOWN OF APEX SECONDARY WATERSHED PROTECTION AREA.
8. FIRM PANEL 3720075100J AND 3720075000J SHOWS THE PRESENCE OF FLOOD ZONES ON PROPERTY.

BOUNDARY INFORMATION OBTAINED FROM WAKE COUNTY GIS, DEED AND PLAT DESCRIPTIONS, APEX LIAR AND OTHER AVAILABLE DATA SOURCES. FINAL BOUNDARY AND SURVEY DOCUMENT WILL BE PROVIDED DURING THE SITE PLAN DESIGN PHASE OF THE DEVELOPMENT.

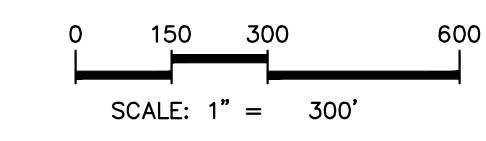
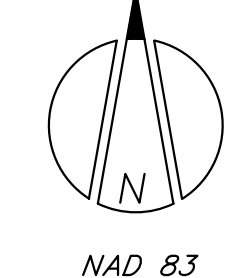
NUMBER	N/F OWNER	PIN	DEED BOOK	DEED PAGE	USE	ZONING
1	Trinity Apex North 100 LLC	0751-32-3228	14735	685	Vacant	RA
2	MFV INVESTMENTS, LLC	0751-32-8256	17311	557	SINGLE FAMILY	RA
3	INDUS REAL ASSOCIATION LLC	0751-42-6828	12215	930	SINGLE FAMILY	RA
4	BLANCHIE HINTON	0751-42-4433	12-E	1476	SINGLE FAMILY	RA
5	MFV INVESTMENTS, LLC	0751-41-4924	17311	557	SINGLE FAMILY	RR
6	KK LAND INC	0751-51-0857	13881	629	VACANT	RR
7	KK LAND INC	0751-40-0697	13881	629	VACANT	RR
8	SIRRHAN GRIFFIN	0751-40-7981	8778	2496	VACANT	RR
9	DWIGHT WRIGHT	0750-49-8888	16215	1702	SINGLE FAMILY	RR
10	DAVID & MARILYN MARTIN	0750-59-0018	17467	358	SINGLE FAMILY	RR
11	MARTHA BURNET	0750-48-5688	13519	1893	SINGLE FAMILY	RR
12	RICHARD BACHOLZKY	0750-48-4775	16444	1976	SINGLE FAMILY	RR
13	KENNETH MOUSHEGIAN	0750-48-3860	12784	2062	SINGLE FAMILY	RR
14	JOSHUA BECK	0750-49-2134	15284	1727	SINGLE FAMILY	RR
15	MELISSA HINTON	0750-39-5262	8281	225	MOBILE	RR
16	EUGENE HORTON HEIRS	0750-39-3222	15-E	1859	VACANT	RR
17	MATTHEW HORTON	0750-29-9045	5861	59	VACANT	RR
18	ALTON RICHARDSON	0750-28-8880	7245	786	VACANT	RR
19	DONALD RICHARDSON	0750-28-8532	11858	2707	VACANT	RR
20	DONALD RICHARDSON	0750-28-6271	7275	654	VACANT	RR
21	ROBERT HEISE	0750-37-1996	16444	2524	SINGLE FAMILY	RR
22	ROBERT CATHEY	0750-37-3664	11988	1801	SINGLE FAMILY	RR
23	RICHARD STEWART	0750-37-2555	11012	2141	SINGLE FAMILY	RR
24	DENNIS DALE	0750-37-1540	11800	97	SINGLE FAMILY	RR
25	TODD YOUNG	0750-37-0454	11069	476	SINGLE FAMILY	RR
26	JOHN FALCHI	0750-27-9358	10836	2123	SINGLE FAMILY	RR
27	TIMOTHY FELTON	0750-27-8301	17376	1337	SINGLE FAMILY	RR
28	MFV INVESTMENTS, LLC	0750-26-4926	16554	2295	SINGLE FAMILY	RR
29	PEMBERLEY PROPERTY OWNERS ASSOCIATION, INC.	0750-17-6279	16533	1996	VACANT	PUD-CZ
30	HORTON, KIMBERLY A	0750-18-4078	16E	969	VACANT	RR
31	MFV INVESTMENTS, LLC	0750-19-7426	16638	1192	VACANT	RR
32	CHARLES WOMBLE	0751-20-1670	4443	94	VACANT	RA

- ON-SITE STREAM BUFFERS
- ON-SITE WETLANDS
- FLOODWAY
- FLOOD FRINGE

\*OFF-SITE STREAM BUFFERS ARE NOT SHOWN

--- PROJECT'S PERIMETER BOUNDARY

**ENVIRONMENTAL FEATURES NOTE:**  
 STREAM BUFFERS WERE OBTAINED FROM APEX WATERSHED PROTECTION OVERLAY DISTRICT MAP, USGS MAPPING, WAKE COUNTY SOILS SURVEY AND AN ONSITE DELINEATION BY SOIL & ENVIRONMENTAL CONSULTANTS (S&C). A FINAL JURISDICTIONAL DETERMINATION (JD) MAP WILL BE PREPARED FOR APPROVAL.

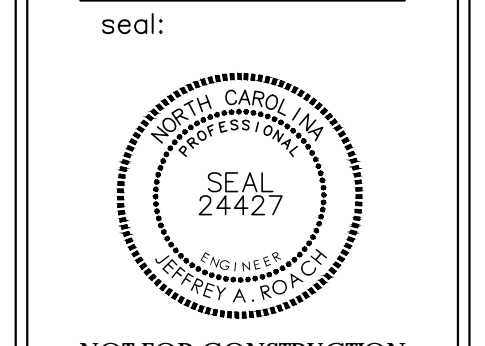


**1** EXISTING CONDITIONS  
 SCALE: 1" = 300'



NC License #P-0673

Project: **HORTON PARK**  
**JESSIE DRIVE**  
**WHITE OAK TOWNSHIP**  
**APEX, NORTH CAROLINA 27502**



NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION
1	7/1/2019	JE	ISSUED FOR PERMIT
2	7/1/2019	JR	REVISED PER COMMENTS

title:  
**EXISTING CONDITIONS**

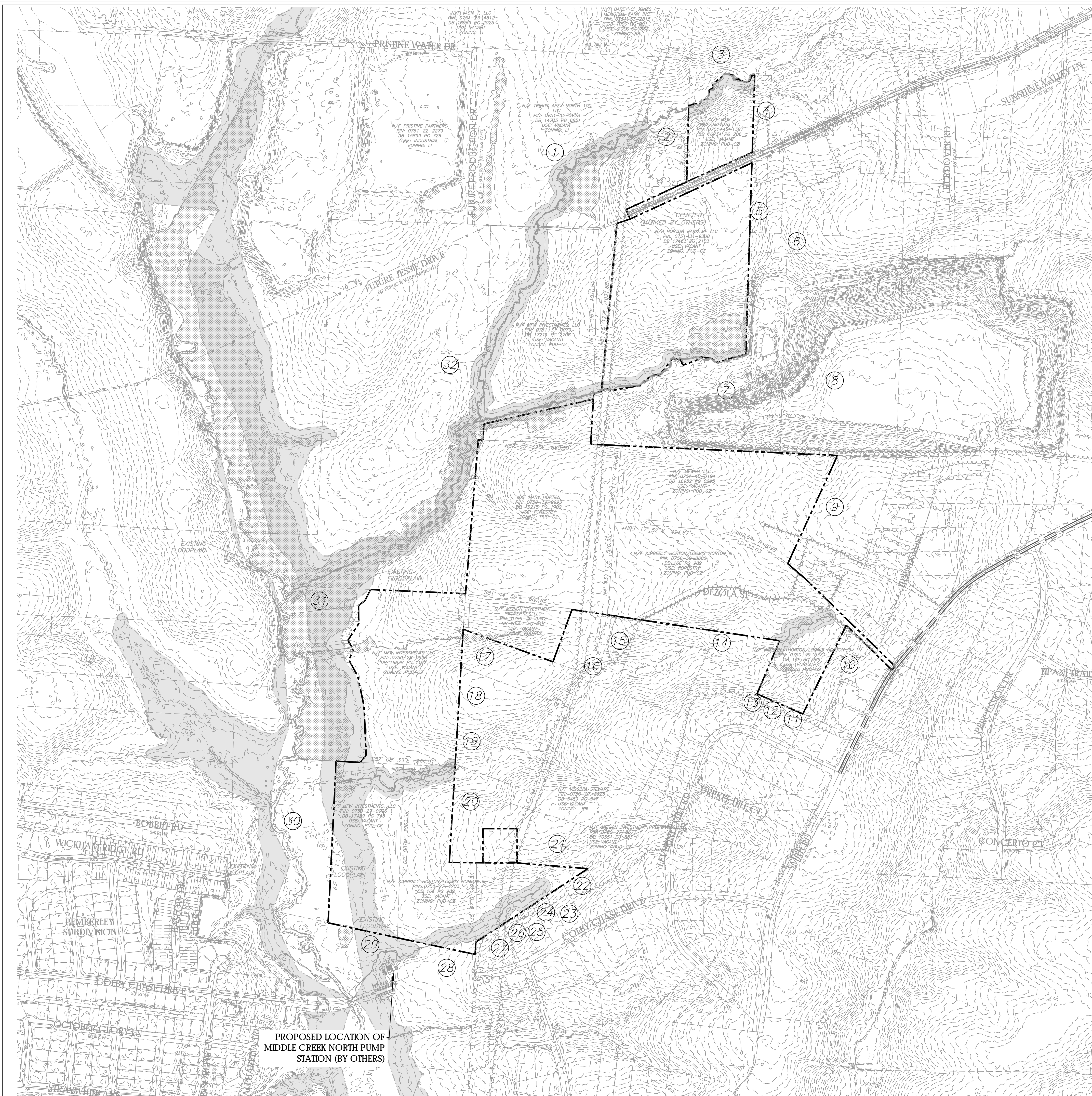
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**161201**

date:  
**July 1, 2019**

dwg by: **chkd by:**  
**JE JR**

scale:  
**1" = 300'**

sheet:  
**C001**  
 Planned Unit Development Plan



ENVIRONMENTAL FEATURES NOTE:  
 STREAM BUFFERS WERE OBTAINED FROM APEX WATERSHED PROTECTION OVERLAY DISTRICT MAP, USGS MAPPING, WAKE COUNTY SOILS SURVEY AND AN ONSITE DELINEATION BY SOIL & ENVIRONMENTAL CONSULTANTS (S&EC). A FINAL JURISDICTIONAL DETERMINATION (JD) MAP WILL BE PREPARED FOR APPROVAL.

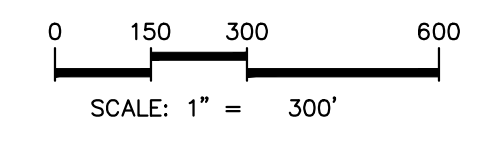
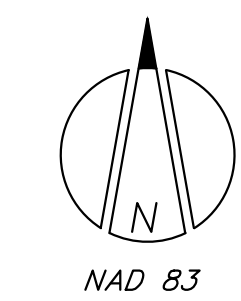
- PROJECT'S PERIMETER BOUNDARY
- ON-SITE STREAM BUFFERS
- ON-SITE WETLANDS
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32	CHARLES WOMBLE	0751-20-1670	4443	94	VACANT	RA

LINE	DIRECTION	DISTANCE
L1	N 75°28'14" E	47.89'
L2	S 70°56'43" E	19.41'
L3	N 30°56'42" E	29.34'
L4	N 64°47'46" E	28.00'
L5	N 35°16'15" E	29.31'
L6	N 40°20'08" E	28.40'
L7	N 62°27'55" E	32.05'
L8	N 10°59'28" W	21.69'
L9	N 49°00'39" E	103.79'
L10	S 24°14'18" E	45.85'
L11	S 10°00'29" E	28.71'
L12	N 63°54'46" E	28.00'
L13	S 62°07'03" E	45.45'
L14	N 75°33'41" E	27.70'
L15	N 65°33'42" E	42.52'
L16	N 80°35'53" E	13.97'
L17	N 89°11'21" W	2.52'
L18	S 72°37'10" W	92.98'
L19	S 71°45'10" W	82.35'
L20	N 60°10'42" W	49.51'
L21	N 87°52'01" W	87.18'
L22	S 49°46'23" W	22.21'
L23	S 70°25'32" W	99.01'
L24	N 24°18'53" W	34.03'
L25	N 77°13'16" W	50.45'
L26	S 37°21'11" W	122.24'
L27	S 84°41'45" W	53.64'
L28	S 48°53'39" W	94.23'
L29	S 70°54'53" W	164.77'
L30	N 79°52'29" W	36.14'
L31	S 87°46'00" W	14.28'
L32	S 86°52'29" W	76.35'
L33	N 45°39'39" E	56.43'
L34	N 01°01'01" E	301.17'
L35	N 07°43'57" W	187.77'
L36	N 24°12'03" W	113.39'
L37	N 24°46'59" E	71.19'
L38	N 26°33'54" W	84.44'
L39	N 37°00'06" E	121.55'
L40	N 07°08'18" E	106.61'
L41	N 02°06'02" E	50.90'
L42	N 26°44'55" E	75.53'

CURVE	ARC LENGTH	ARC RADIUS	CHORD BEARING	CHORD LENGTH
C1	613.63'	1,097.99'	S 65°19'32" E	605.68'
C2	144.28'	1,097.99'	S 45°33'02" E	144.18'

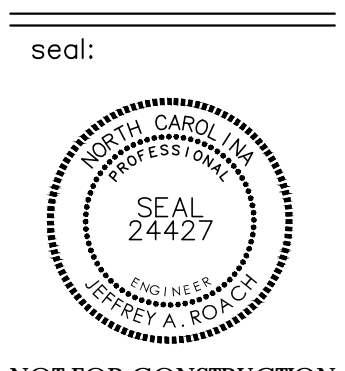


1 EXISTING CONDITIONS  
 C002 SCALE: 1" = 300'



NC License #P-0673

Project: **HORTON PARK**  
**JESSIE DRIVE**  
**WHITE OAK TOWNSHIP**  
**APEX, NORTH CAROLINA 27502**



NOT FOR CONSTRUCTION

NO.	DATE	BY	REVISION

title:

**EXISTING CONDITIONS (TOPO)**

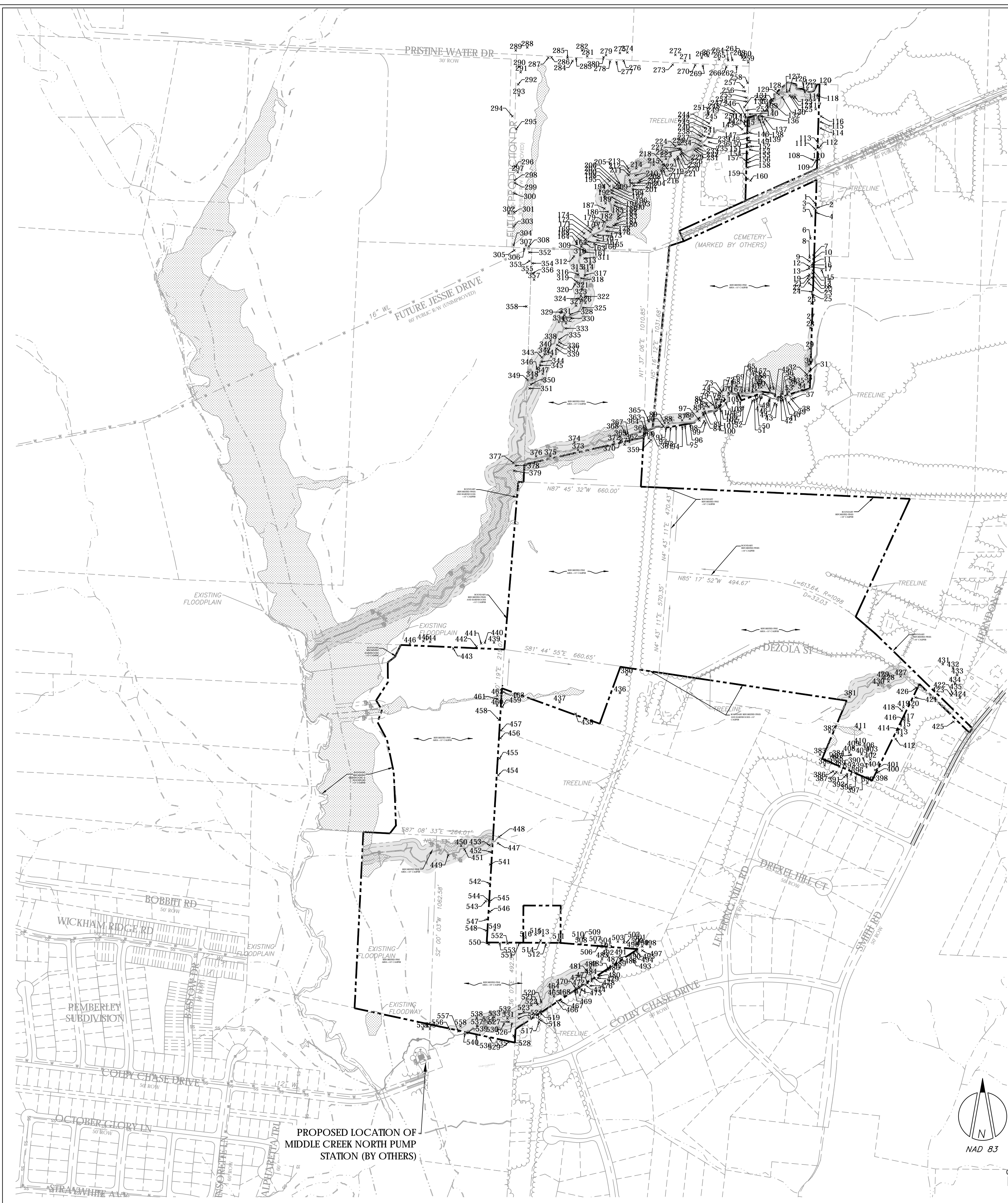
proj #: **161201**

date: **July 1, 2019**

dwg by: **chkd by: JE JR**

scale: **1" = 300'**

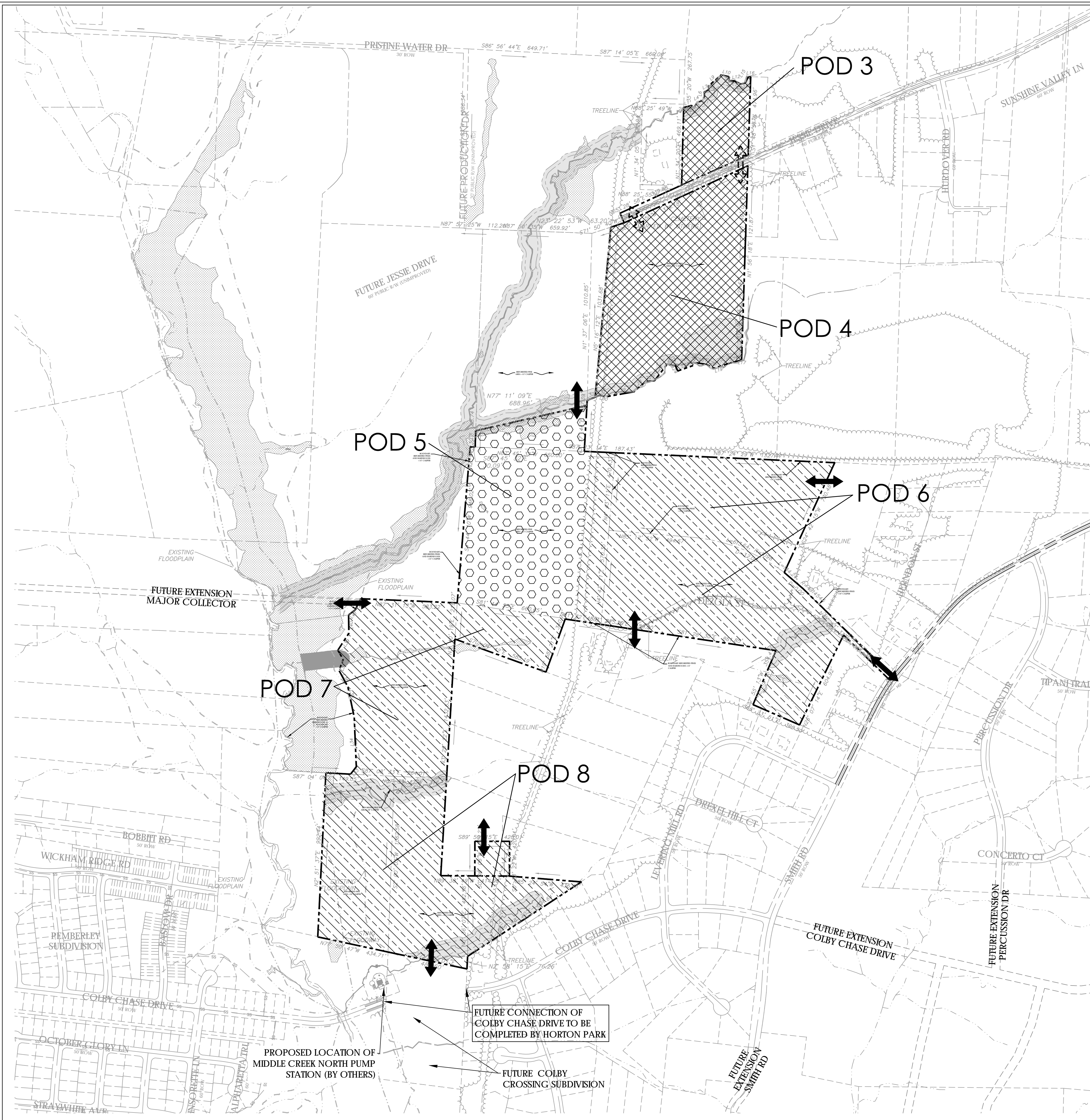
sheet: **C002**  
 Planned Unit Development Plan



EXISTING TREE TABLE	EXISTING TREE TABLE	EXISTING TREE TABLE	EXISTING TREE TABLE	EXISTING TREE TABLE	EXISTING TREE TABLE		
TREE NUMBER	SPECIES	TREE NUMBER	SPECIES	TREE NUMBER	SPECIES		
1	18" SWEET GUM	101	22" RED OAK	201	21" BLACK GUM	301	19" SWEET GUM
2	18" SWEET GUM	102	22" RED OAK	202	21" ELM	302	20" RED MAPLE
3	18" SWEET GUM	103	20" POPLAR	203	20" WILLOW OAK	303	32" WILLOW OAK
4	18" SWEET GUM	104	21" PINE	204	20" POPLAR TWNS	304	28" PINE
5	18" SWEET GUM	105	19" SWEET GUM	205	20" BLACK GUM	305	18" WHITE OAK
6	19" PINE	106	20" SWEET GUM	206	20" WHITE OAK	306	19" WILLOW OAK
7	25" SWEET GUM	107	21" POPLAR	207	38" RED MAPLE	307	20" WHITE OAK
8	20" PINE	108	20" PINE	208	21" POPLAR	308	18" SWEET GUM
9	18" PINE	109	24" SWEET GUM	209	20" WHITE OAK	309	18" WHITE OAK
10	19" PINE	110	28" PINE	210	23" POPLAR	310	19" SWEET GUM
11	18" PINE	111	20" PINE	211	20" WILLOW OAK	311	29" WILLOW OAK
12	18" PINE	112	18" PINE	212	19" POPLAR	312	19" RED MAPLE
13	19" PINE	113	40" WHITE OAK	213	19" PINE	313	18" RED MAPLE
14	21" PINE	114	36" WHITE OAK	214	20" PINE	314	21" POPLAR
15	23" WHITE OAK	115	23" POPLAR	215	21" RED MAPLE	315	19" PINE
16	20" PINE	116	20" SWEET GUM	216	19" POPLAR	316	20" ELM
17	19" PINE	117	22" WHITE OAK	217	19" POPLAR	317	19" POPLAR
18	21" PINE	118	20" PINE	218	26" PINE	318	21" POPLAR
19	20" PINE	119	21" PINE	219	21" PINE	319	26" SWEET GUM
20	29" RED OAK	120	20" POPLAR	220	24" POPLAR	320	21" WILLOW OAK
21	19" PINE	121	20" POPLAR	221	25" POPLAR	321	20" SWEET GUM
22	22" PINE	122	23" PINE	222	19" POPLAR	322	27" WHITE OAK
23	22" PINE	123	20" SWEET GUM	223	23" PINE	323	20" POPLAR
24	21" SWEET GUM	124	18" PINE	224	19" POPLAR	324	21" WILLOW OAK
25	22" SWEET GUM	125	18" RED OAK	225	21" PINE	325	21" WILLOW OAK
26	21" PINE	126	19" RED OAK	226	22" PINE	326	21" HICKORY
27	22" POPLAR	127	21" PINE	227	20" PINE	327	19" RED MAPLE
28	22" PINE	128	18" SWEET GUM	228	22" PINE	328	20" WILLOW OAK
29	19" SWEET GUM	129	18" POPLAR	229	21" PINE	329	20" RED OAK
30	21" SWEET GUM	130	18" RED OAK	230	22" PINE	330	19" RED OAK
31	18" POPLAR	131	24" PINE	231	20" WILLOW OAK	331	19" SWEET GUM
32	19" SWEET GUM	132	20" PINE	232	18" POPLAR	332	19" WHITE OAK
33	23" PINE	133	19" POPLAR	233	20" SWEET GUM	333	19" POPLAR
34	19" SWEET GUM	134	23" POPLAR	234	22" POPLAR	334	18" PINE
35	18" SWEET GUM	135	19" POPLAR	235	22" POPLAR	335	18" PINE
36	20" POPLAR	136	18" SWEET GUM	236	24" PINE	336	19" RED MAPLE
37	19" RED OAK	137	21" PINE	237	25" PINE	337	19" WILLOW OAK
38	20" POPLAR	138	21" WHITE OAK	238	21" PINE	338	25" RED MAPLE
39	26" POPLAR	139	21" POPLAR	239	19" POPLAR	339	20" RED MAPLE
40	23" WHITE OAK	140	20" RED OAK	240	22" PINE	340	18" PINE
41	21" PINE	141	28" POPLAR	241	25" POPLAR	341	21" BLACK GUM
42	19" PINE	142	20" POPLAR	242	19" PINE	342	20" WHITE OAK
43	21" WHITE OAK	143	18" PINE	243	18" PINE	343	22" SWEET GUM
44	20" PINE	144	24" PINE	244	18" WHITE OAK	344	20" POPLAR
45	20" SWEET GUM	145	20" POPLAR	245	21" PINE	345	19" SWEET GUM
46	18" POPLAR	146	21" POPLAR	246	28" RED OAK	346	35" WILLOW OAK
47	23" RED MAPLE	147	23" PINE	247	18" RED OAK	347	20" POPLAR
48	35" PINE	148	21" WHITE OAK	248	18" RED OAK	348	33" SYCAMORE
49	21" POPLAR	149	22" PINE	249	23" PINE	349	33" WILLOW OAK
50	23" POPLAR	150	19" WHITE OAK	250	26" PINE	350	22" POPLAR
51	20" POPLAR	151	25" POPLAR	251	19" WHITE OAK	351	28" POPLAR
52	21" WHITE OAK	152	20" SWEET GUM	252	20" PINE	352	24" WILLOW OAK
53	22" CHESTNUT OAK	153	20" RED OAK	253	18" PINE	353	21" WILLOW OAK
54	19" POPLAR	154	25" SWEET GUM	254	18" POPLAR	354	21" RED OAK
55	27" SWEET GUM	155	18" SWEET GUM	255	22" PINE	355	18" WILLOW OAK
56	20" SWEET GUM	156	21" WHITE OAK	256	18" WHITE OAK	356	19" WHITE OAK
57	19" PINE	157	19" WHITE OAK	257	21" POPLAR	357	18" WHITE OAK
58	20" BLACK OAK	158	25" TWIN SWEET GUM	258	18" WHITE OAK	358	18" WHITE OAK
59	19" POPLAR	159	48" TWIN WHITE OAK	259	20" POPLAR	359	19" RED MAPLE
60	21" RED APPLE	160	18" SWEET GUM	260	21" PINE	360	25" RED OAK
61	21" PINE	161	20" HICKORY	261	21" PINE	361	19" WHITE OAK
62	26" PINE	162	19" WHITE OAK	262	19" PINE	362	20" RED MAPLE
63	27" PINE	163	22" WHITE OAK	263	22" POPLAR	363	30" RED MAPLE
64	18" POPLAR	164	20" WHITE OAK	264	18" POPLAR	364	21" RED OAK
65	23" POPLAR	165	19" WHITE OAK	265	18" PINE	365	26" POPLAR
66	23" RED OAK	166	20" WILLOW OAK	266	18" WHITE OAK	366	22" SWEET GUM
67	19" CHESTNUT OAK	167	20" WHITE OAK	267	23" RED OAK	367	18" RED MAPLE
68	23" WHITE OAK	168	18" PINE	268	40" POPLAR	368	18" RED MAPLE
69	22" PINE	169	19" POPLAR	269	18" RED OAK	369	26" GREEN ASH
70	25" POPLAR	170	18" POPLAR	270	19" SWEET GUM	370	21" POPLAR
71	20" POPLAR	171	19" WHITE OAK	271	23" WHITE OAK	371	40" POPLAR
72	28" PINE	172	19" BLACK GUM	272	20" PINE	372	18" CHESTNUT OAK
73	23" PINE	173	19" BLACK GUM	273	20" WHITE OAK	373	22" POPLAR
74	23" WHITE OAK	174	20" POPLAR	274	22" RED OAK	374	24" CHESTNUT OAK
75	24" POPLAR	175	20" POPLAR OAK	275	18" WHITE OAK	375	18" WHITE OAK
76	25" CHESTNUT OAK	176	28" WILLOW OAK	276	23" RED OAK	376	18" POPLAR
77	21" CHESTNUT OAK	177	19" WHITE OAK	277	18" RED OAK	377	19" GREEN ASH
78	22" POPLAR	178	22" POPLAR	278	18" RED OAK	378	20" GREEN ASH
79	18" CHESTNUT OAK	179	21" PINE	279	20" RED OAK	379	19" WILLOW OAK
80	18" CHESTNUT OAK	180	30" WHITE OAK	280	20" WHITE OAK	380	22" WHITE OAK
81	20" SWEET GUM	181	18" WILLOW OAK	281	18" PINE	381	19" WHITE OAK
82	24" POPLAR	182	19" BLACK GUM	282	18" WHITE OAK	382	18" POPLAR
83	26" CHESTNUT OAK	183	32" WILLOW OAK	283	20" PINE	383	19" PINE
84	22" POPLAR	184	21" WILLOW OAK	284	21" PINE	384	20" PINE
85	53" CHESTNUT OAK	185	23" WILLOW OAK	285	18" WHITE OAK	385	23" POPLAR
86	20" POPLAR	186	20" WHITE OAK	286	19" PINE	386	24" POPLAR
87	19" POPLAR	187	24" PINE	287	20" RED OAK	387	22" WHITE OAK
88	19" SWEET GUM	188	20" POPLAR	288	18" PINE	388	21" POPLAR
89	22" RED OAK	189	18" PINE	289	20" SWEET GUM	389	20" PINE
90	21" PINE	190	20" WHITE OAK	290	19" POPLAR	390	21" RED OAK
91	20" POPLAR	191	19" POPLAR	291	19" PINE	391	20" PINE
92	22" RED OAK	192	18" PINE	292	19" PINE	392	19" POPLAR
93	24" POPLAR	193	28" WILLOW OAK	293	18" PINE	393	19" PINE
94	20" RED OAK	194	26" WHITE OAK	294	19" POPLAR	394	18" PINE
95	20" SWEET GUM	195	18" POPLAR	295	18" PINE	395	19" PINE
96	25" PINE	196	20" PINE	296	18" PINE	396	19" PINE
97	18" POPLAR	197	20" WILLOW OAK	297	19" WHITE OAK	397	18" POPLAR
98	18" POPLAR	198	19" PINE	298	19" PINE	398	19" PINE
99	20" POPLAR	199	19" PINE	299	19" PINE	399	20" PINE
100	23" POPLAR	200	20" POPLAR	300	21" WILLOW OAK	400	18" PINE

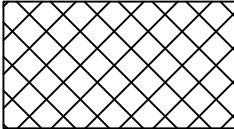
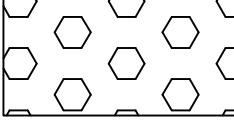
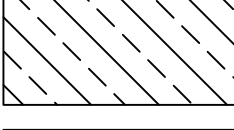



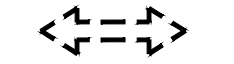
**EXISTING CONDITIONS - TREE SURVEY**  
 SCALE: 1" = 300'

NO.	DATE	BY	REVISION
1	11/15/2019	JE	ISSUE FOR PERMIT
2	11/15/2019	JR	REVISED TREE SURVEY

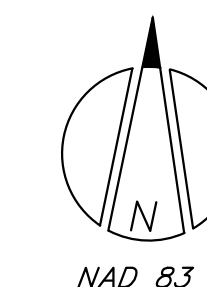


POD SUMMARY			
POD #	DWELLING TYPE	ACREAGE	MAXIMUM ALLOWED
3	Single Family	4.55	18*
3	Townhomes	4.55	27**
4	Apartments	20.99	314***
4	Townhomes	20.99	125**
5	Single Family	19.71	78*
5	Townhomes	19.71	118**
6, 7 & 8	Single Family	82.59	227

PODs 6, 7 & 8 are limited by the number of lots - not density

-  APARTMENTS AND/OR TOWNHOUSES
-  TOWNHOUSES
-  SINGLE FAMILY
-  ON-SITE STREAM BUFFERS
-  PROJECT PERIMETER BOUNDARY
-  POTENTIAL ACCESS POINTS (PHASE 1)
-  POTENTIAL ACCESS POINTS (PHASE 2)

PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY



0 150 300 600  
SCALE: 1" = 300'

**1** CONCEPTUAL SITE PLAN  
C100 SCALE: 1" = 100'

NOTE:  
STREAM BUFFERS BASED UPON AN ON-SITE EVALUATION BY S&E.C. INC. IN CONJUNCTION WITH THE U.S. ARMY CORPS OF ENGINEERS, NC-DWR, AND THE TOWN OF APEX.



NO.	DATE	REVISION	BY
1	August 8, 2019	S&E.C. Comments & Plan Revisions	JE
2	September 11, 2019	S&E.C. Comments & Plan Revisions	JR

title:  
**CONCEPTUAL SITE PLAN**

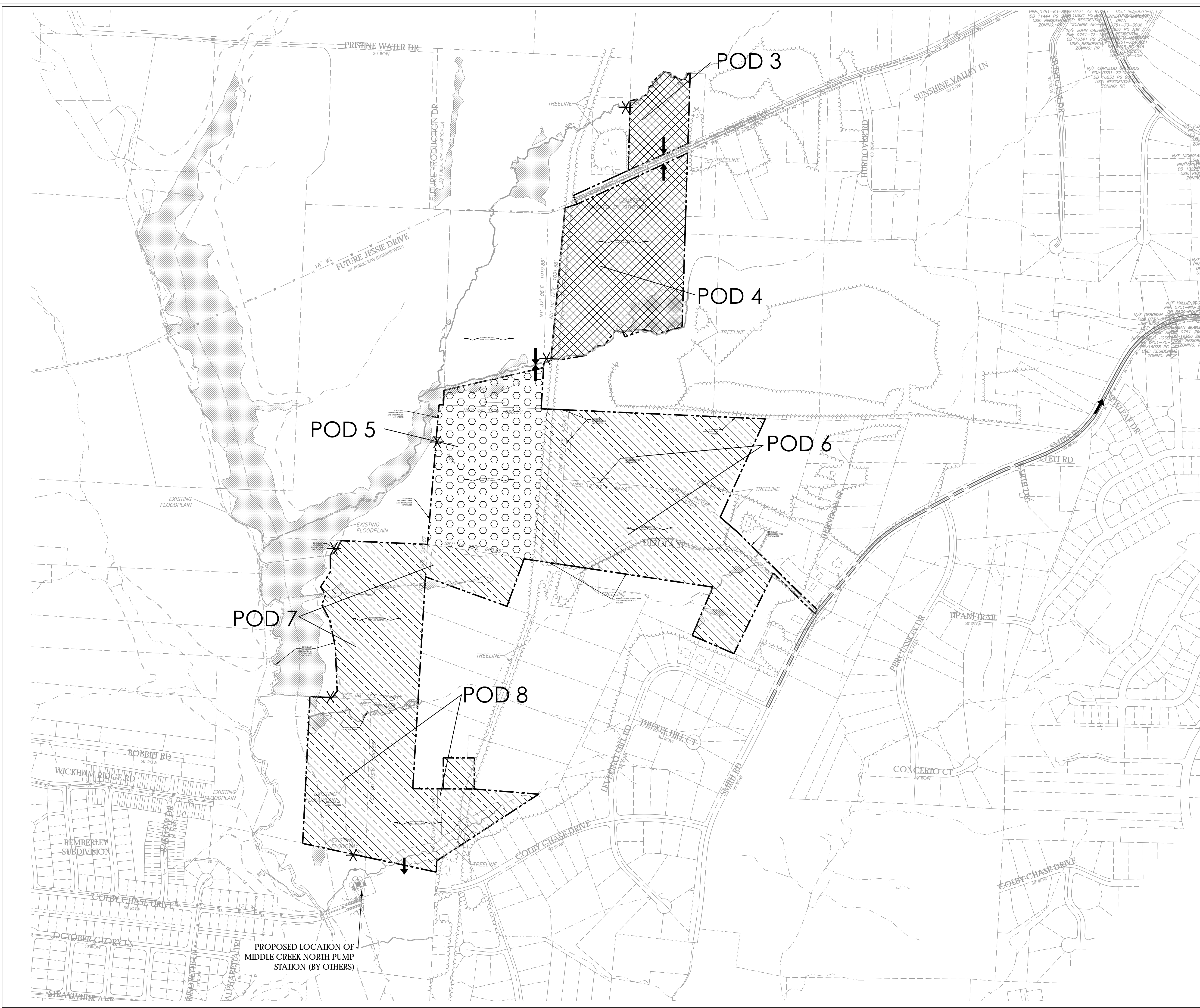
proj #:  
**161201**

date:  
**July 1, 2019**

dwg by: chkd by:  
JE JR

scale:  
**1" = 100'**

sheet:  
**C100**  
Planned Unit  
Development Plan



↑ PROPOSED WATER CONNECTIONS  
 ✕ PROPOSED SEWER CONNECTIONS

FINAL LOCATION AND TIMING OF WATER CONNECTIONS SHALL BE COORDINATED WITH THE TOWN OF APEX PUBLIC WORKS AND PLANNING DEPARTMENT DURING THE MASTER SUBDIVISION PLAN OR SITE PLAN SUBMITTALS.

- UTILITY NOTES:**
1. THE SITE IS REQUESTING FULL TOWN SERVICES - WATER, SEWER AND ELECTRICITY
  2. THIS SITE WILL NOT UTILIZE PRIVATE SEWAGE DISPOSAL.
  3. NEW SANITARY SEWER WILL BE PROVIDED WITH THE MIDDLE CREEK NORTH REGIONAL PUMP STATION.

PROJECT PERIMETER BOUNDARY

NAD 83

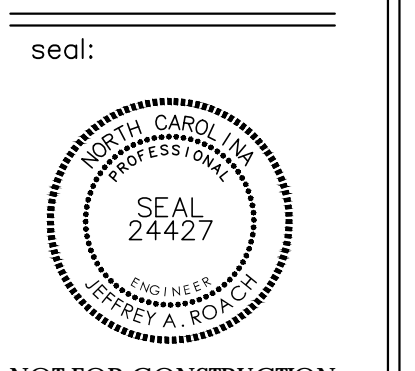
0 50 100 200  
SCALE: 1" = 100'

**1** CONCEPTUAL UTILITY PLAN  
SCALE: 1" = 100'



NC License #P-0673

Project:  
**HORTON PARK**  
**JESSIE DRIVE**  
**WHITE OAK TOWNSHIP**  
**APEX, NORTH CAROLINA 27502**



NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY
1	7/1/2019	DRG. CONCEPTUAL UTILITY PLAN	JE
2	7/1/2019	DRG. CONCEPTUAL UTILITY PLAN	JR

title:  
**CONCEPTUAL UTILITY PLAN**

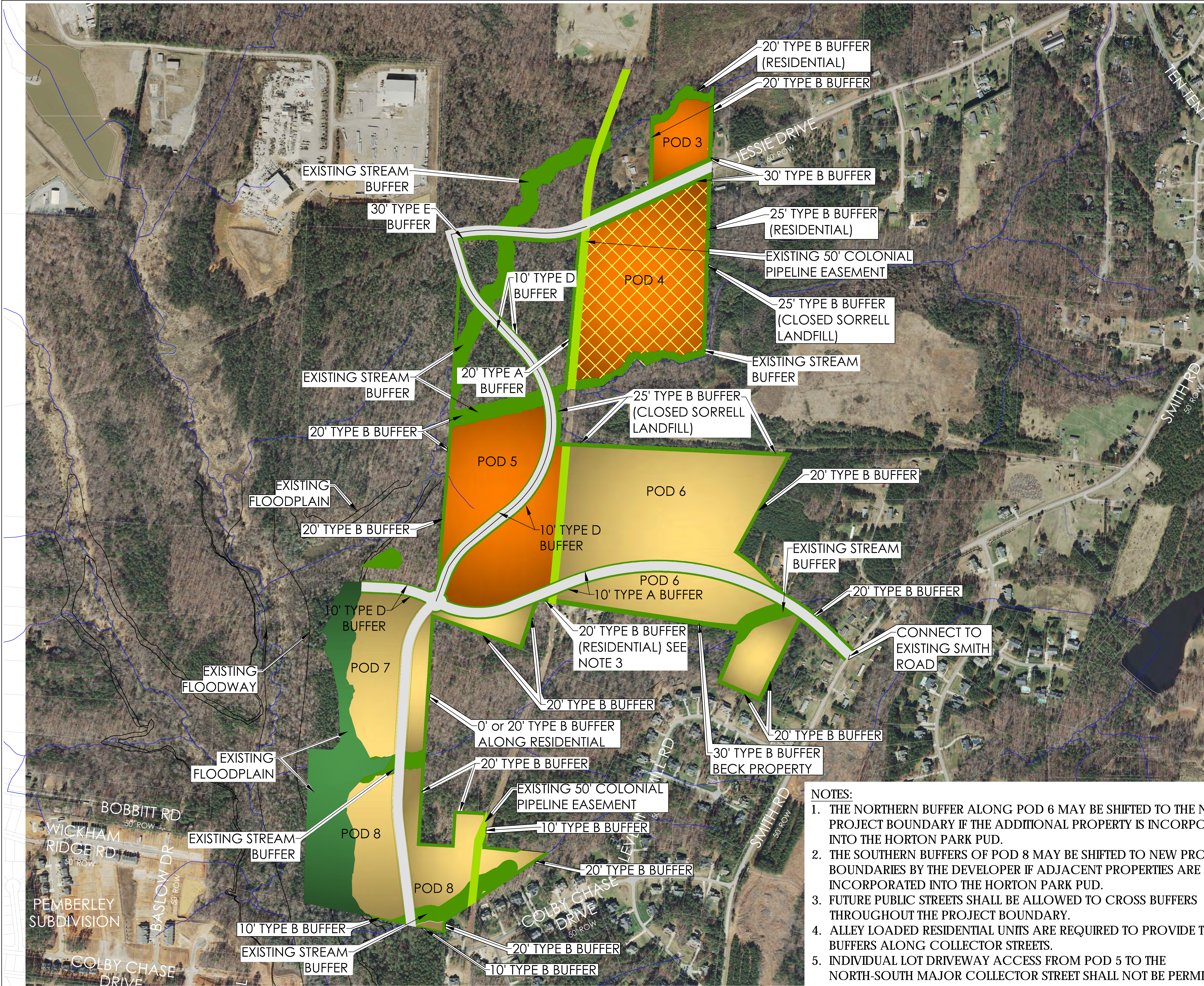
proj #:  
**161201**

date:  
**July 1, 2019**

dwg by: chkd by:  
 JE JR

scale:  
**1" = 100'**

sheet:  
**C200**  
 Planned Unit Development Plan



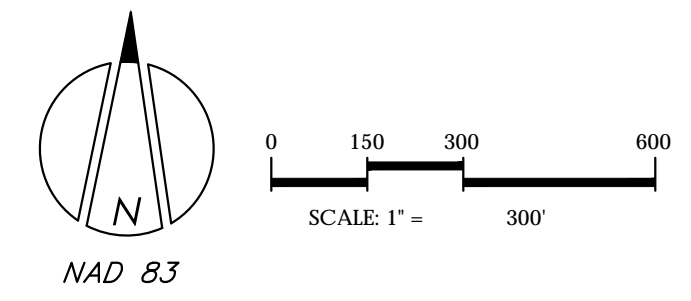
POD SUMMARY			
POD #	DWELLING TYPE	ACREAGE	MAXIMUM ALLOWED
3	Single Family	4.55	18*
3	Townhomes	4.55	27**
4	Apartments	20.99	314***
4	Townhomes	20.99	125**
5	Single Family	19.71	78*
5	Townhomes	19.71	118**
6, 7 & 8	Single Family	82.59	227

PODs 6, 7 & 8 are limited by the number of lots - not density

\* 4 UNITS PER ACRE  
 \*\* 6 UNITS PER ACRE  
 \*\*\* 15 UNITS PER ACRE

- APARTMENTS AND/OR TOWNHOUSES
- TOWNHOUSES AND/OR SINGLE FAMILY
- SINGLE FAMILY
- FLOODPLAIN OR BUFFERS
- PROPOSED STREETS

- NOTES:**
1. THE NORTHERN BUFFER ALONG POD 6 MAY BE SHIFTED TO THE NEW PROJECT BOUNDARY IF THE ADDITIONAL PROPERTY IS INCORPORATED INTO THE HORTON PARK PUD.
  2. THE SOUTHERN BUFFERS OF POD 8 MAY BE SHIFTED TO NEW PROJECT BOUNDARIES BY THE DEVELOPER IF ADJACENT PROPERTIES ARE INCORPORATED INTO THE HORTON PARK PUD.
  3. FUTURE PUBLIC STREETS SHALL BE ALLOWED TO CROSS BUFFERS THROUGHOUT THE PROJECT BOUNDARY.
  4. ALLEY LOADED RESIDENTIAL UNITS ARE REQUIRED TO PROVIDE TYPE 'D' BUFFERS ALONG COLLECTOR STREETS.
  5. INDIVIDUAL LOT DRIVEWAY ACCESS FROM POD 5 TO THE NORTH-SOUTH MAJOR COLLECTOR STREET SHALL NOT BE PERMITTED.



No.	DATE	REVISION	BY
1	August 9, 2019	TBC COMMENTS & PLAN REVISIONS	JR
2	September 13, 2019	TBC COMMENTS & PLAN REVISIONS	JR

Designer: JE Scale: 1" = 300'  
 Drawn By: JE Date: 7-01-2019  
 Checked By: JR Job No.: 161201

**HORTON PARK**  
 APEX, NORTH CAROLINA

**PROPOSED SITE EXHIBIT**

**PEAK** Engineering & Design  
 5448 Apex Peakway #368 | Apex, NC 27502  
 ph: 919.439.0100 fax: 919.439.8411  
 www.PeakEngineeringDesign.com

## SINGLE FAMILY BUILDING ELEVATIONS

### Single-family residential standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. All single-family homes shall have a crawl space or have a raised foundation which at a minimum rises at least 20 inches from average grade across the front of the house to the finished floor level at the front door.
3. Garage doors must have windows, decorative details or carriage-style adornments.
4. The garage cannot protrude more than 1 foot out from the front façade or front porch.
5. The roof shall be pitched at 5:12 or greater for 50% of the building designs.
6. Garages on the front façade of a home that faces the street shall not exceed 40% of the total width of the house and garage together.
7. Eaves shall project at least 12 inches from the wall of the structure.
8. The visible side of a home on a corner lot facing the public street shall contain at least 3 decorative elements such as, but not limited to, the following elements:
  - Windows
  - Bay window
  - Recessed window
  - Decorative window
  - Trim around the windows
  - Wrap around porch or side porch
  - Two or more building materials
  - Decorative brick/stone
  - Decorative trim
  - Decorative shake
  - Decorative air vents on gable
  - Decorative gable
  - Decorative cornice
  - Column
  - Portico
  - Balcony
  - Dormer
9. A varied color palette shall be utilized on homes throughout the subdivision to include a minimum of three color families for siding and shall include varied trim, shutter, and accent colors complementing the siding color.
10. House entrances for units with front-facing single-car garages shall have a prominent covered porch/stoop area leading to the front door.
11. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.
12. Front porches shall be a minimum of 6 feet deep.
13. No more than 25% of the lots may be accessed with J-driveways. There shall be no more than 3 such homes in a row on any single block. Any lots eligible for a J-driveway home shall be identified on the Final Plat.
14. A maximum of 100% of the single family detached residential units within POD 6 shall be permitted as “zero-entry” homes without the 20 inch rise from average grade across the front of the property to the finished floor elevation. All “zero-entry” homes shall also provide first floor master bedrooms. Lots permitted as “zero-entry” shall be noted on the Final Plat.
15. All single family detached residential homes are to be pre-configured with conduit for a solar energy system.
16. No less than 10 single family detached homes out of the first 100 homes within POD 6 will be installed with a minimum of a 4 kW solar PV system.



## Townhome and Single Family Home Color Palette (Sherwin Williams)

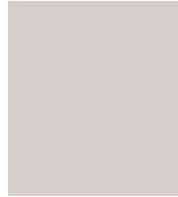
All colors are Primary with the exception of those noted



SW 6166  
ECLIPSE



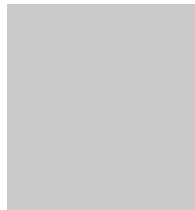
SW 7502  
DRY ROCK



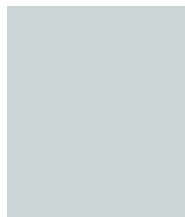
SW 6008  
INDIVIDUAL  
AZURITE



SW 9148  
SMOKEY



SW 6260  
UNIQUE GRAY



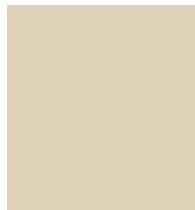
SW 9136  
LULLABY  
SLATE



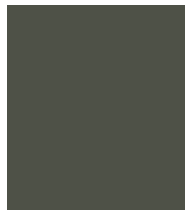
SW 9131  
CORNWALL  
GREEN



SW 6524  
COMMODORE



SW 9119  
DIRTY  
MARTINI



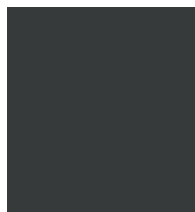
SW 6188  
SHADE  
GROWN



SW 9117  
URBAN  
JUNGLE



SW 6156  
RAMIE



SW 6994  
GREENBLACK  
ACCENT



SW 6717  
LIME RICKEY  
ACCENT



SW 7589  
HABANERO  
CHILE  
ACCENT



SW 70399148  
VIRTUAL  
TAUPE

White may also be used as a primary, trim, or accent color with any palette variations



**Wakefield**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



Left Elevation



Rear Elevation



Right Elevation

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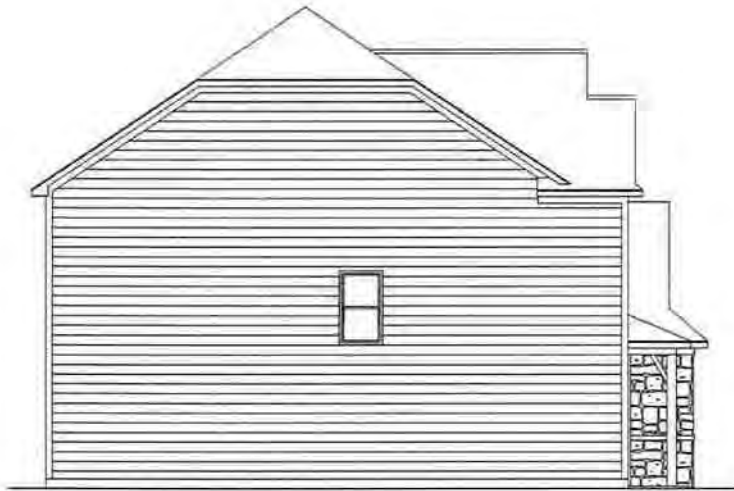
# Wakefield - French Country

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



### **Wakefield**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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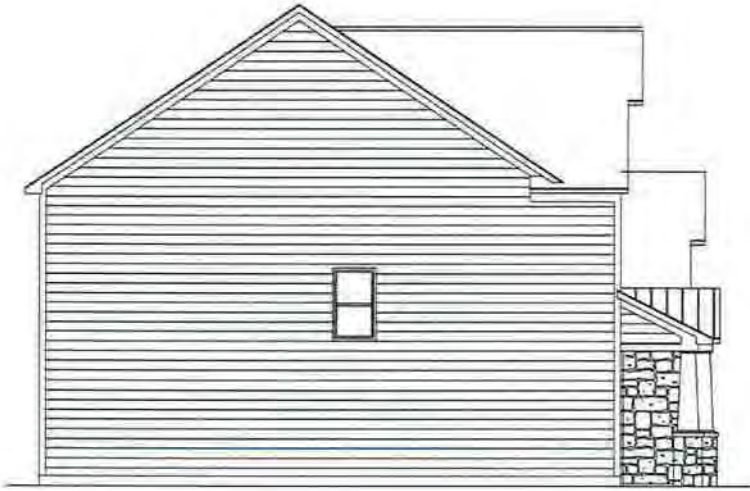
# Wakefield - Low Country

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Wakefield**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



Left Elevation



Right Elevation



Rear Elevation

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# Wakefield - Craftsman

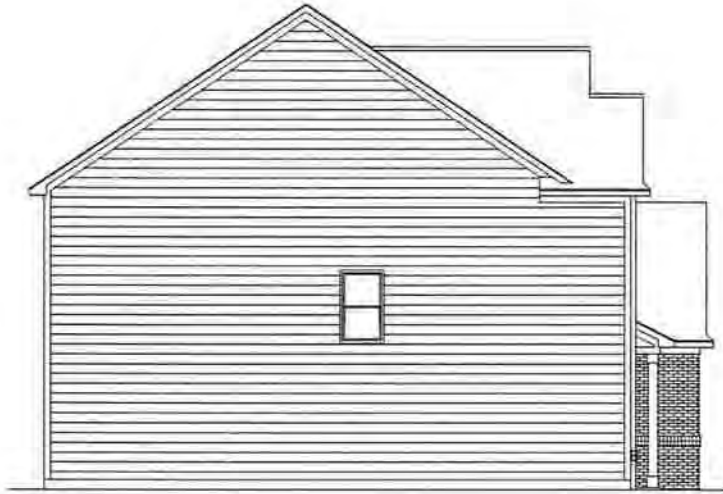
BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



## Wakefield

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Left Elevation



Right Elevation



Rear Elevation

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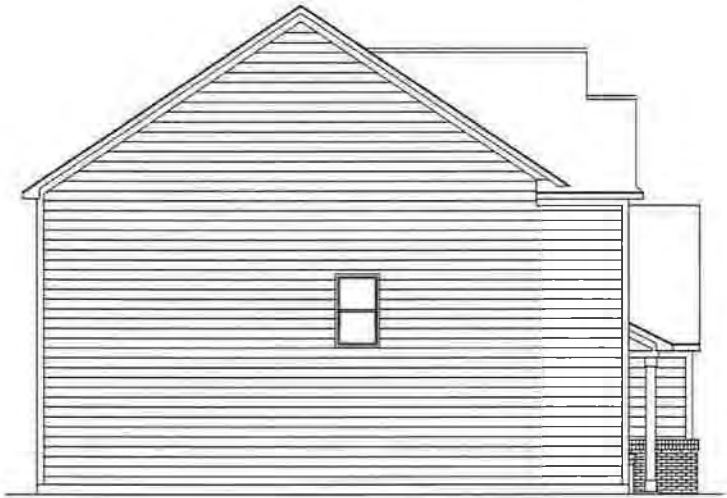
# Wakefield - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

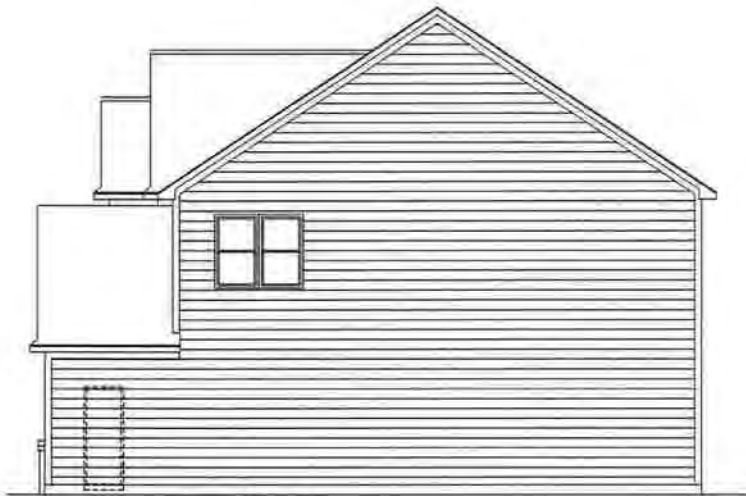


**Wakefield**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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# Wakefield - Federal - Siding

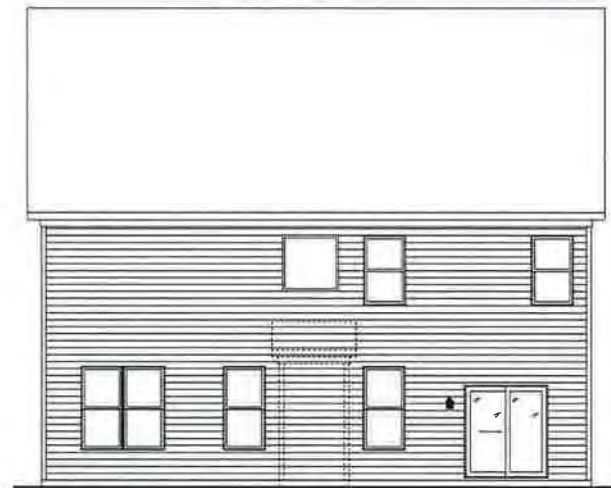
BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



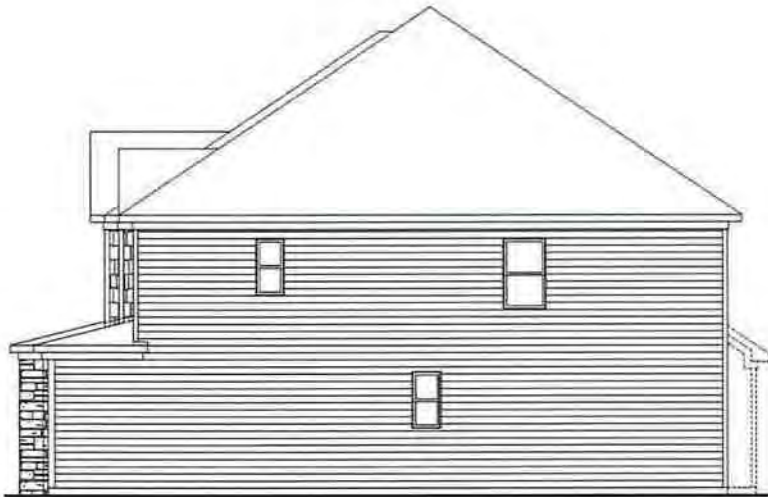
Rear Elevation

## Dorset - Craftsman

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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# Dorset - French Country

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



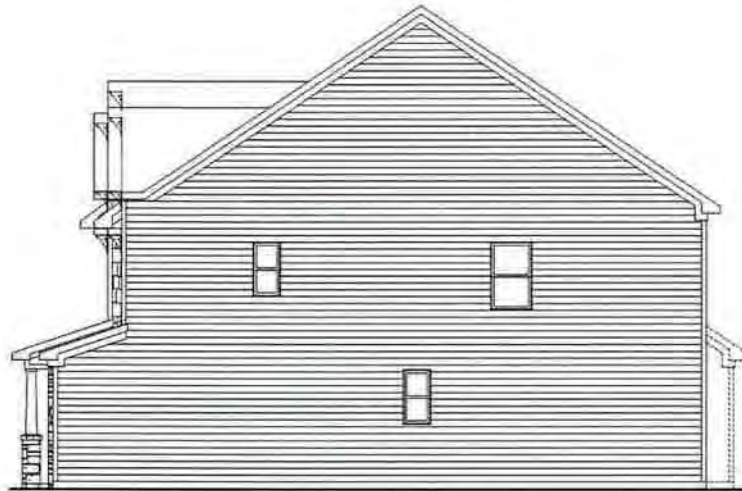
Rear Elevation

# Dorset - Low Country

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



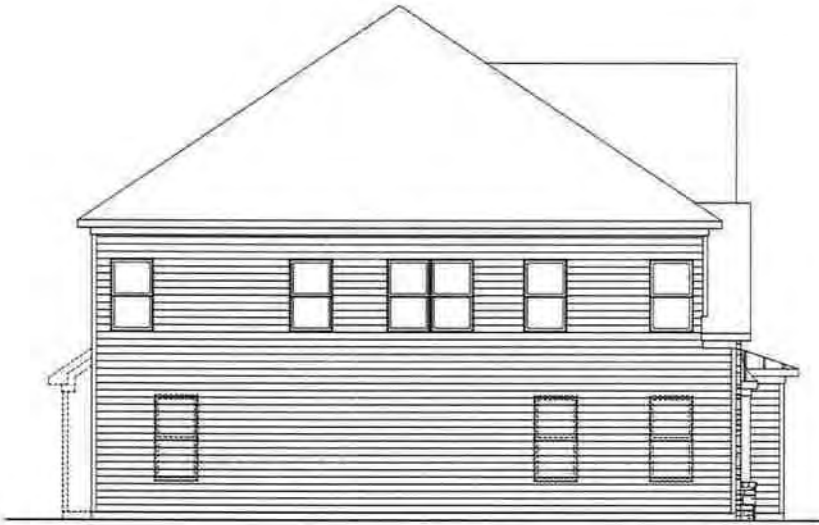
Right Elevation



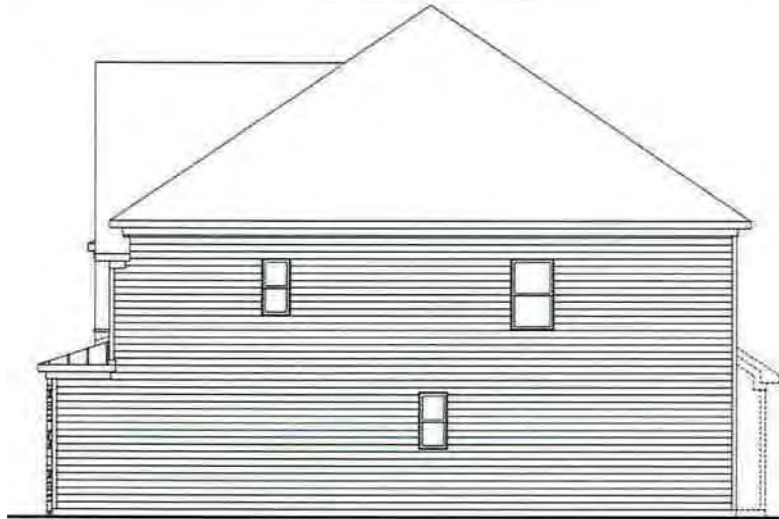
Rear Elevation

# Dorset - Arts and Crafts

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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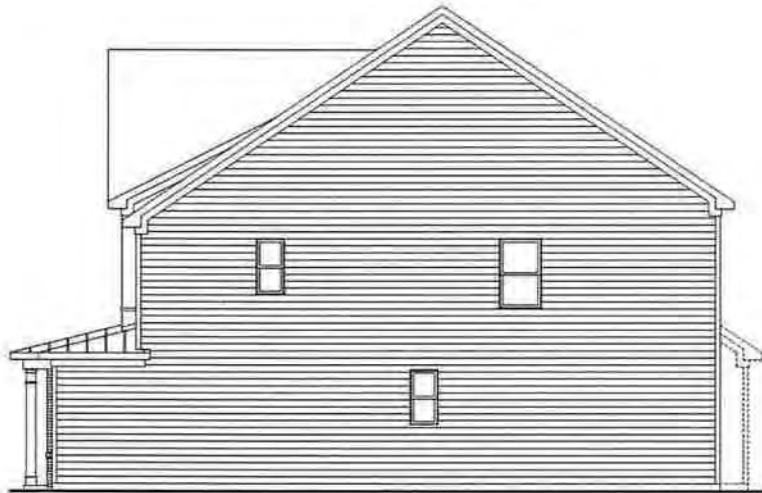
## Dorset - European

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Left Elevation



Right Elevation



Rear Elevation

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# Dorset - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

---

# Dorset - Federal - Siding

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



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ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





**Low Country**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



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**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**

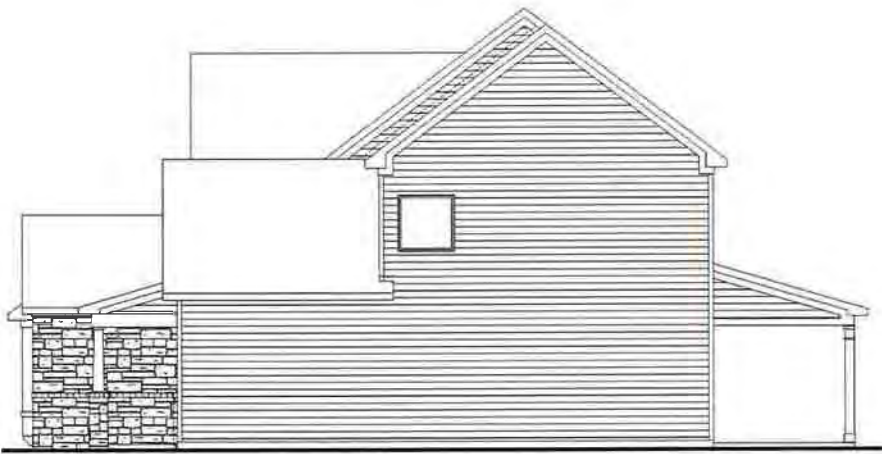


**Essex II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



Left Elevation



Right Elevation

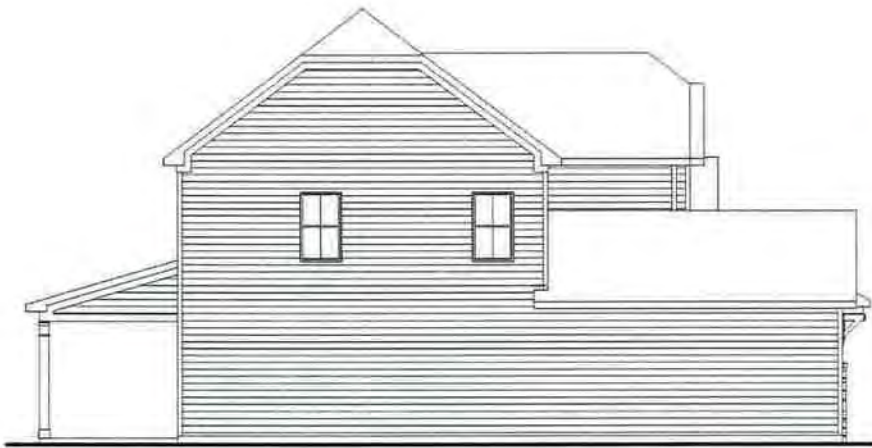


Rear Elevation

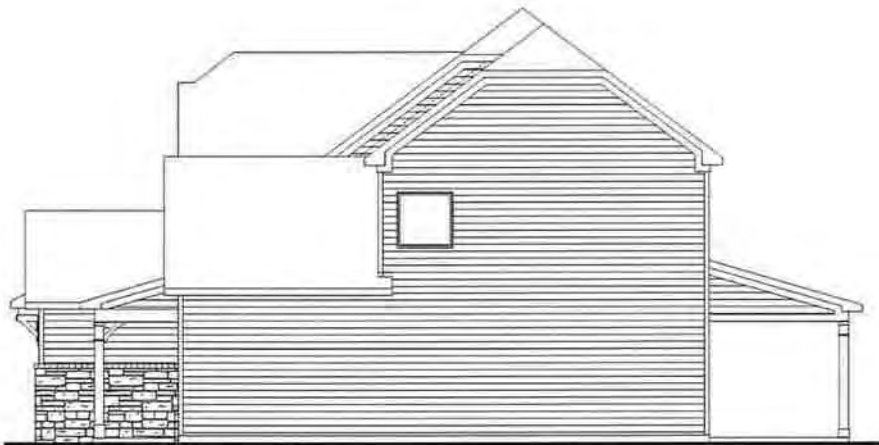
# Brighton - Craftsman

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Left Elevation



Right Elevation



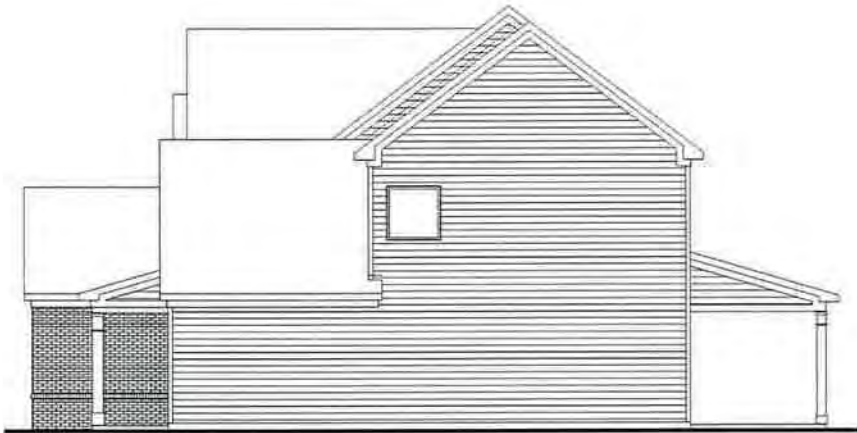
Rear Elevation

# Brighton - Farmhouse

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



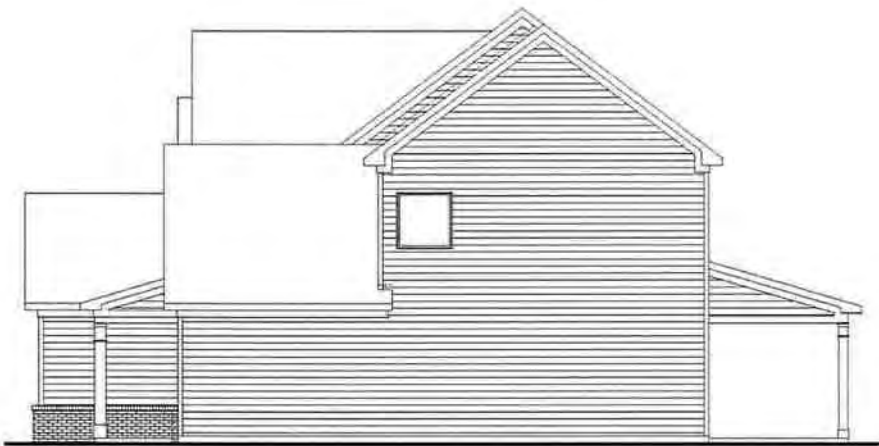
Rear Elevation

# Brighton - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

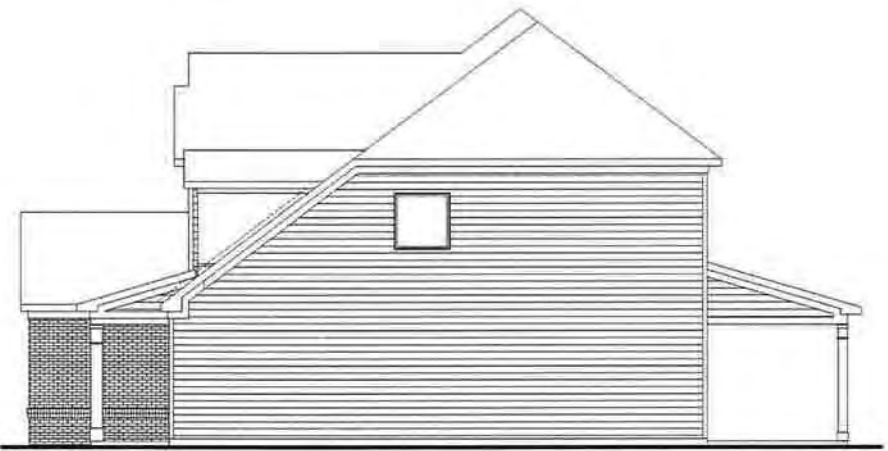
---

# Brighton - Federal - Siding

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

# Brighton - Traditional

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



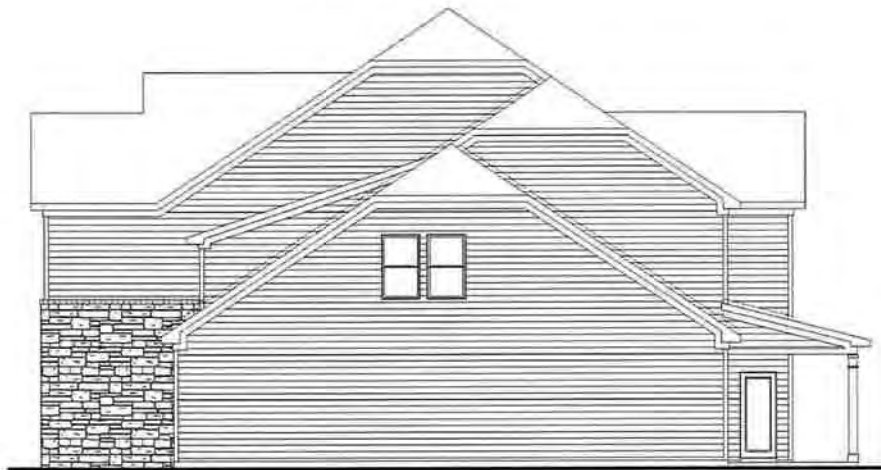
Rear Elevation

# Highland - Craftsman

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

# Highland - Farmhouse

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

# Highland - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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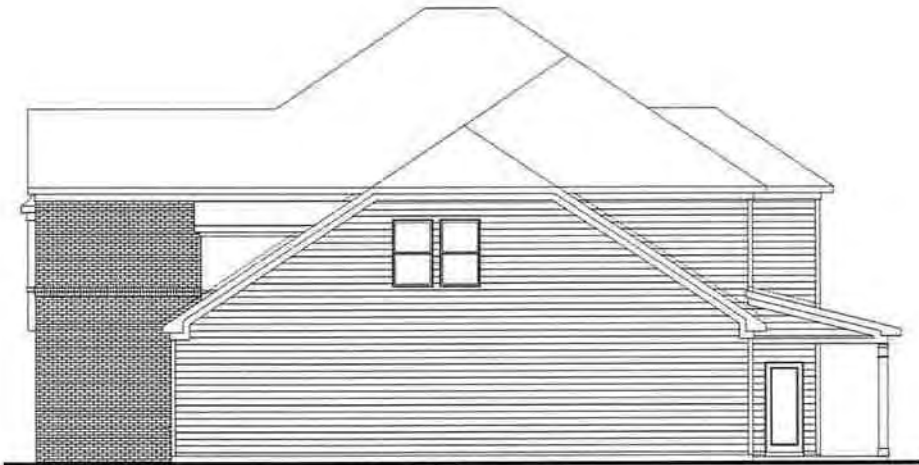
# Highland - Federal - Siding

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Left Elevation



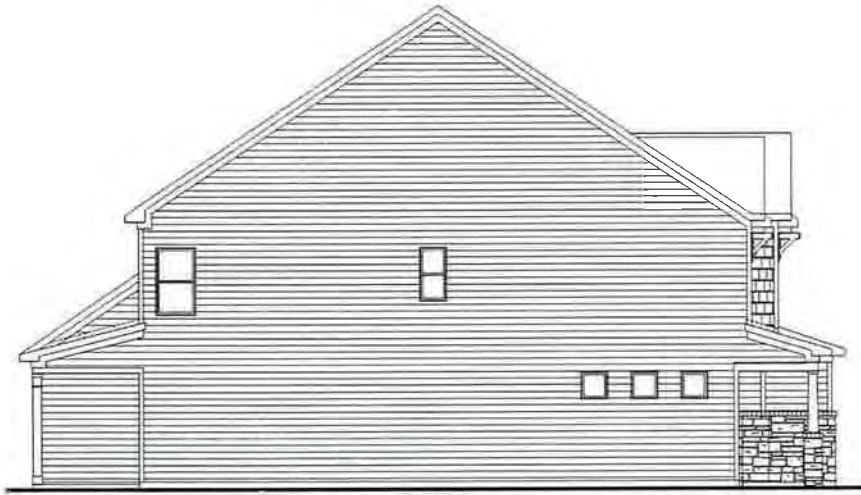
Right Elevation



Rear Elevation

# Highland - Traditional

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



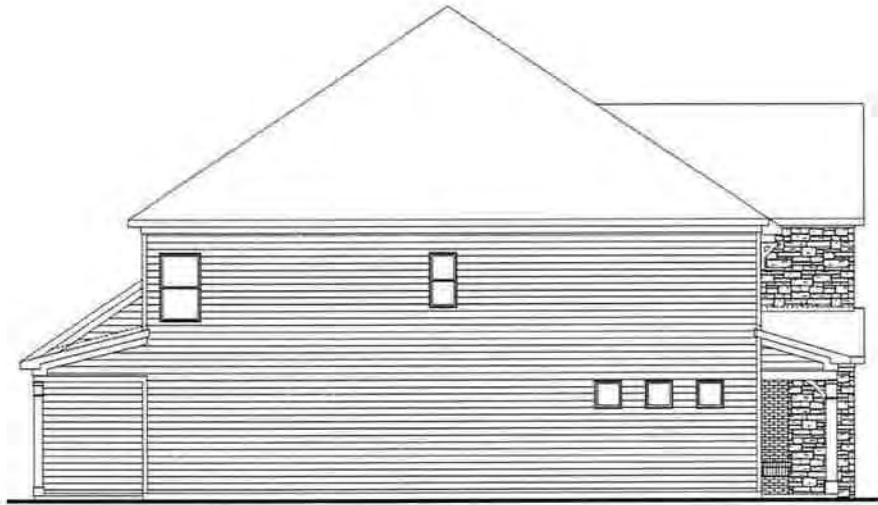
Right Elevation



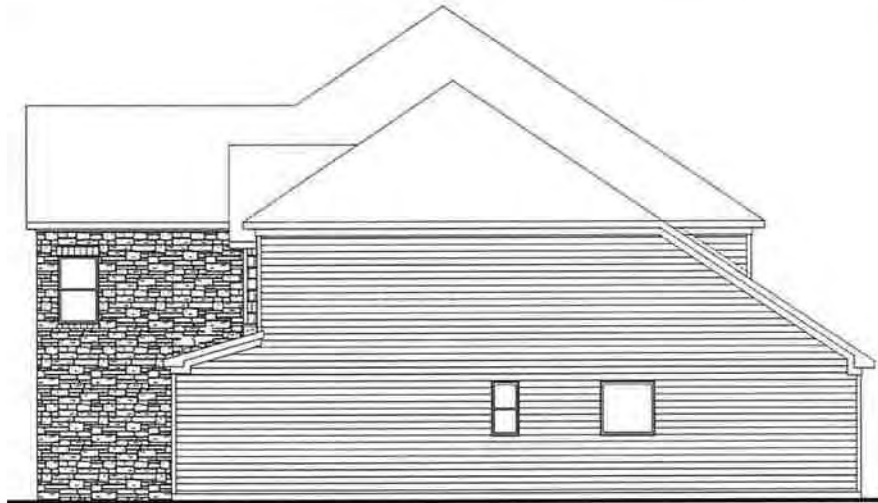
Rear Elevation

# Kendyll - Craftsman

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



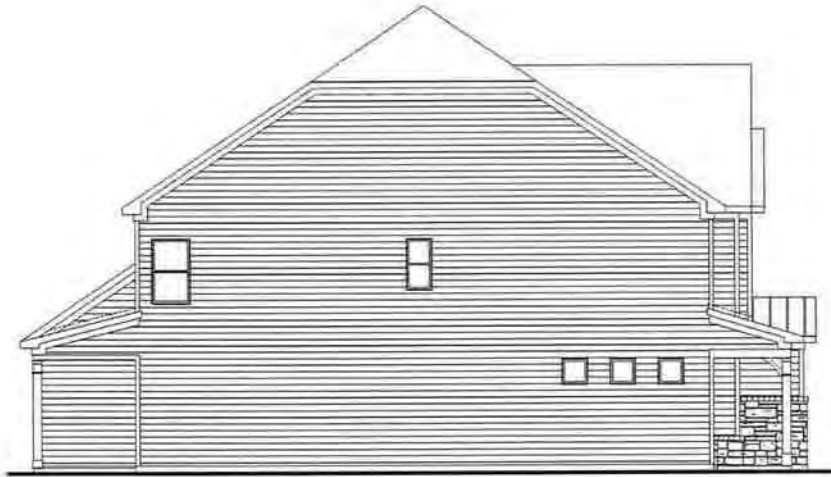
Right Elevation



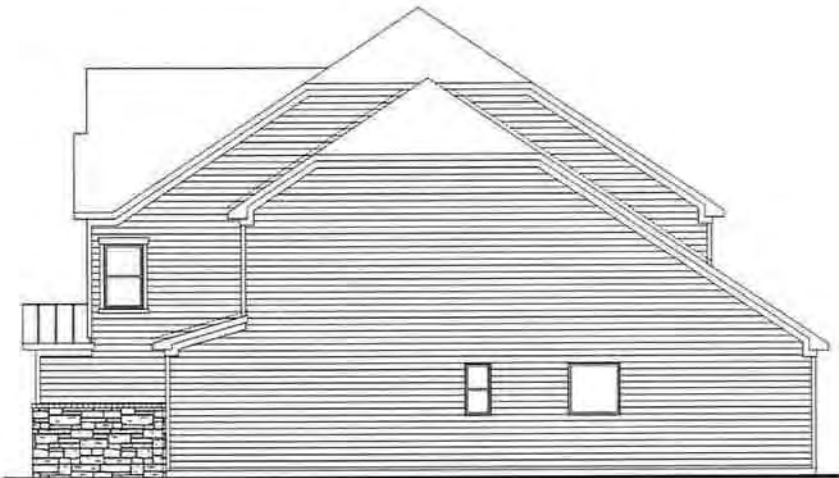
Rear Elevation

# Kendyll - European

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



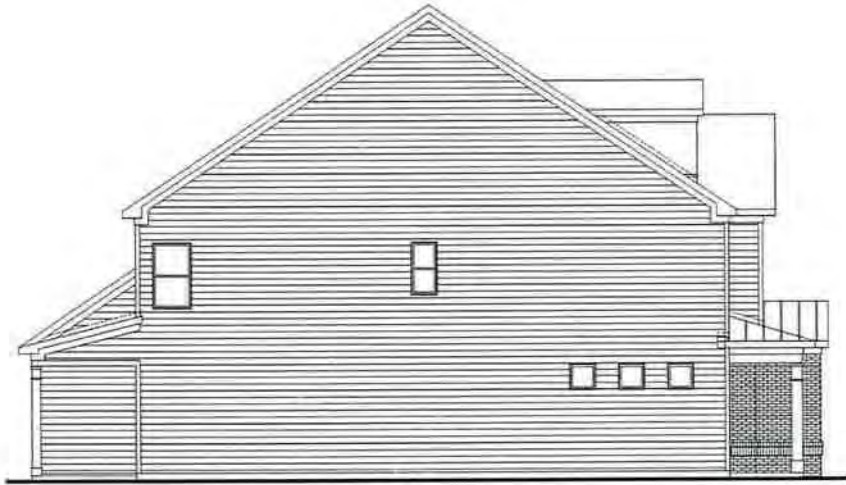
Right Elevation



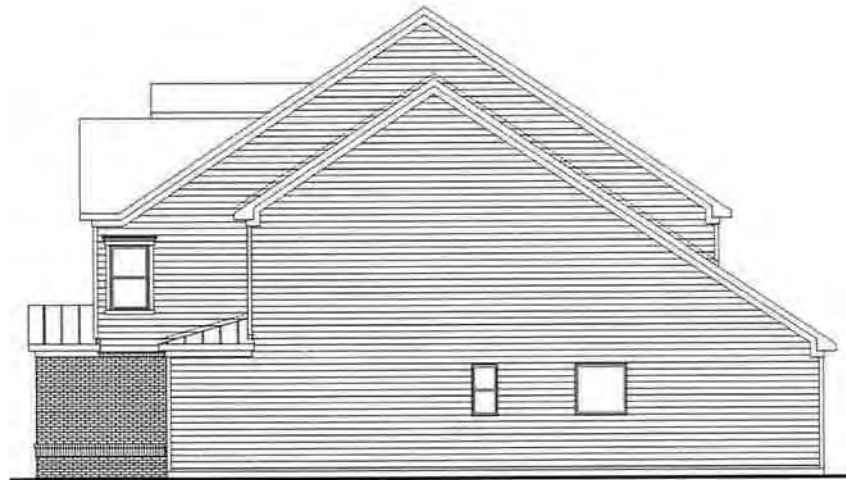
Rear Elevation

# Kendyll - Farmhouse

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

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# Kendyll - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



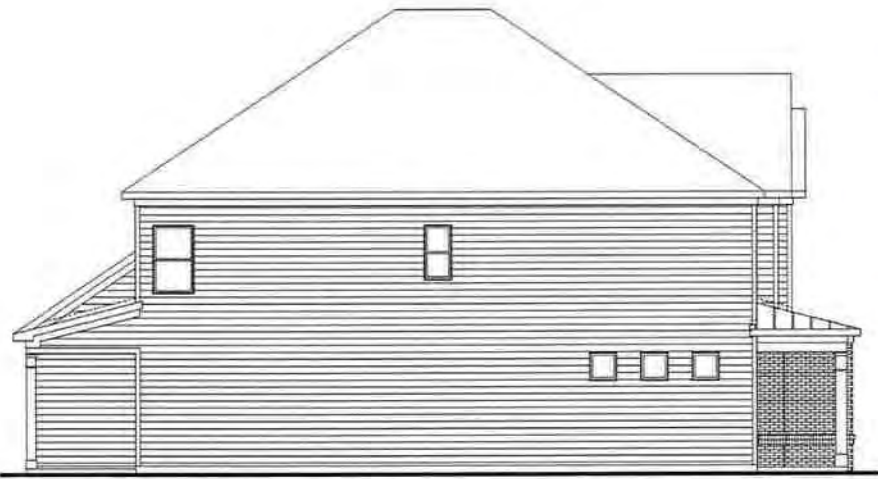
Right Elevation



Rear Elevation

# Kendyll - Federal - Siding

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



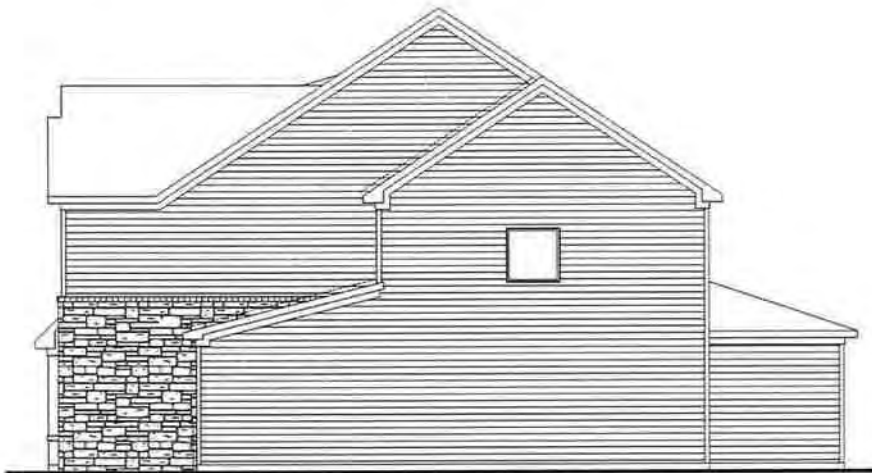
Rear Elevation

# Kendyll - Traditional

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

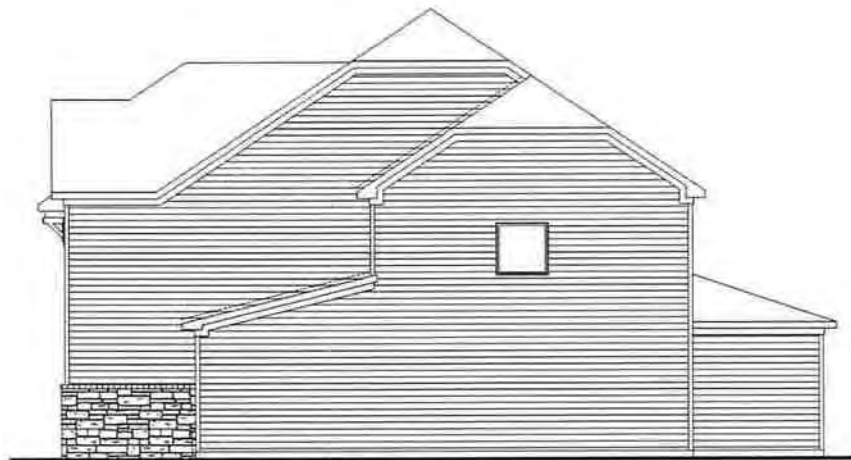
# London - Craftsman

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Left Elevation



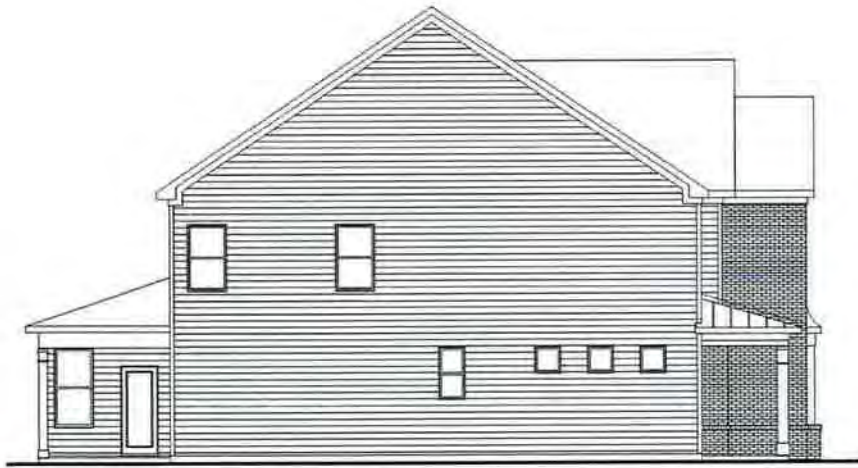
Right Elevation



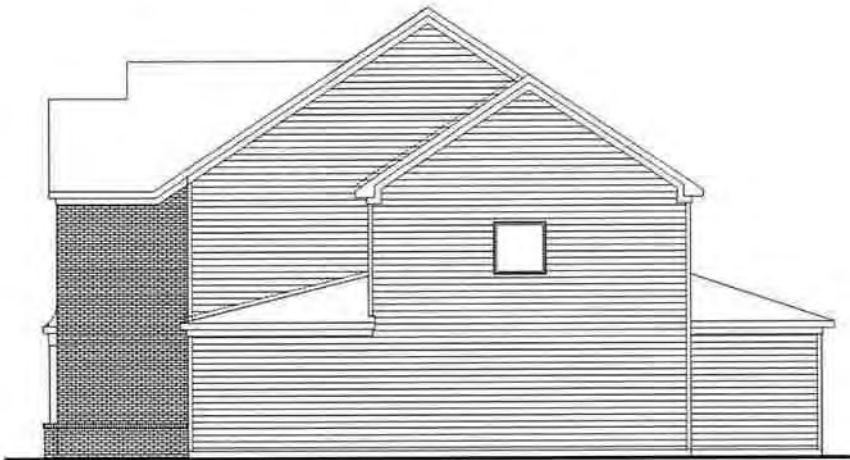
Rear Elevation

# London - Farmhouse

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation

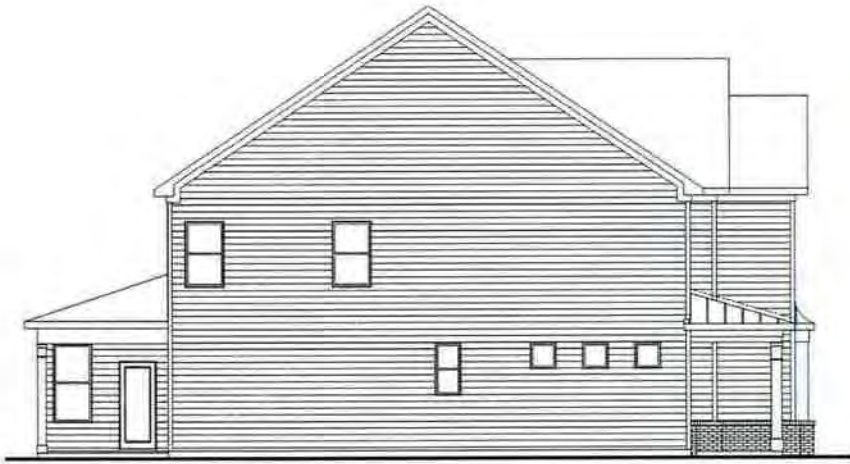


Rear Elevation

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# London - Federal - Brick

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



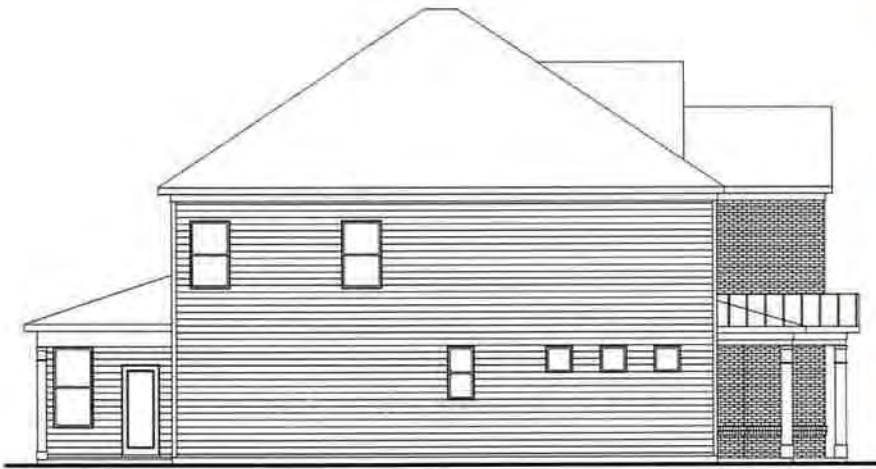
Right Elevation



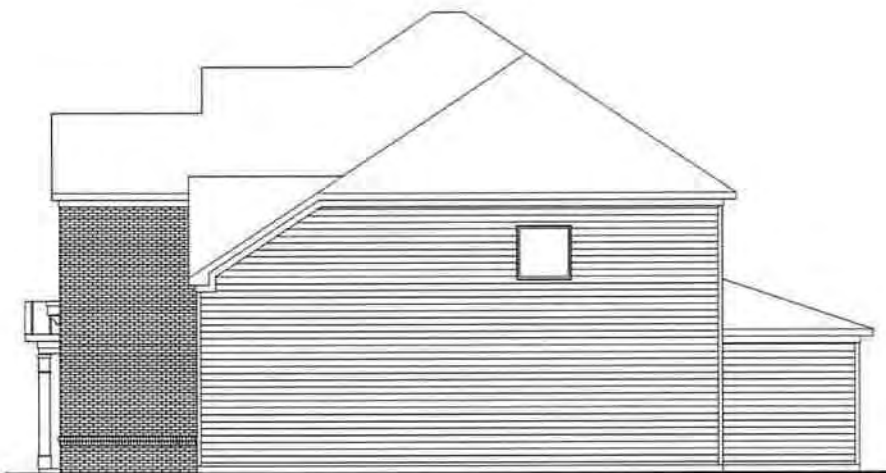
Rear Elevation

# London - Federal - Siding

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Left Elevation



Right Elevation



Rear Elevation

---

# London - Traditional

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Livingston**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Livingston**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Livingston**

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**Livingston**

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**Livingston**

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**Waverly**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



**Waverly**

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**Waverly**

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**Somerset**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**

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**Somerset**

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ILLUSTRATIVE PURPOSES ONLY**



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**Prescott II**

**BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY**



**Prescott II**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





**Pescott II**

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**Prescott II**

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ILLUSTRATIVE PURPOSES ONLY



**Prescott II**

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Game Changer

3,037 square feet

3 Bedrooms | 2.5 Bathrooms



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Massey

2,883 square feet

4 Bedrooms | 3.5 Bathrooms | Game Room



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Barrett

3,147 square feet

4 Bedrooms | 3 Bathrooms | Study



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Stratton

3,217 square feet

4 Bedrooms | 3.5 Bathrooms



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Bliss

2,056 square feet

3 Bedrooms | 2.5 Bathrooms



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# Sanctuary

2,580 square feet

4 Bedrooms | 3.5 Bathrooms



Elevation B



Elevation A



Elevation C

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



# Braxton

2,935 square feet

4 Bedrooms | 2.5 Bathrooms | Loft



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

# House Party

3,015 square feet

4 Bedrooms | 2.5 Bathrooms



Elevation C



Elevation A



Elevation B

BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY

## TOWNHOME BUILDING ELEVATIONS

### Townhome Standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. All townhomes shall have a crawl space or raised foundation which at a minimum rises at least 12 inches from average grade across the front of the house to the finished floor level at the front door.
3. Roofline cannot be a single mass; it must be broken up horizontally and vertically between units.
4. Garage doors must have windows, decorative details or carriage-style adornments.
5. House entrances for units with front-facing single-car garages shall have a prominent covered porch/stoop area leading to the front door.
6. The garage cannot protrude more than 1 foot out from the front façade or front porch.
7. The visible side of a townhome on a corner lot facing the public street shall contain at least 2 decorative elements such as, but not limited to, the following elements:
  - Windows
  - Bay window
  - Recessed window
  - Decorative window
  - Trim around the windows
  - Wrap around porch or side porch
  - Two or more building materials
  - Decorative brick/stone
  - Decorative trim
  - Decorative shake
  - Decorative air vents on gable
  - Decorative gable
  - Decorative cornice
  - Column
  - Portico
  - Balcony
  - Dormer
8. Building facades shall have horizontal relief achieved by the use of recesses and projections.
9. A varied color palette shall be utilized on homes throughout the subdivision to include a minimum of three color families for siding and shall include varied trim, shutter, and accent colors complementing the siding color.
10. The rear and side elevations of the units that can be seen from the right-of-way shall have trim around the windows.
11. Minor elevation adjustments may be accommodated with staff approval – including limiting clipped dormers on no more than 25% of the proposed townhome building designs.
12. Side entry, end unit townhomes in highly visible locations shall provide a covered entry feature for each unit. Highly visible locations shall include the end of a series of buildings, and adjacent to public or private rights-of-ways, recreation areas, open space, buffers, or adjacent properties.

## Townhome and Single Family Home Color Palette (Sherwin Williams)

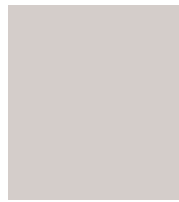
All colors are Primary with the exception of those noted



SW 6166  
ECLIPSE



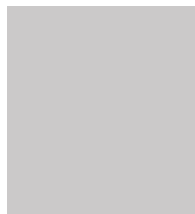
SW 7502  
DRY ROCK



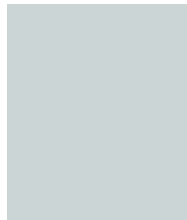
SW 6008  
INDIVIDUAL  
AZURITE



SW 9148  
SMOKEY



SW 6260  
UNIQUE GRAY



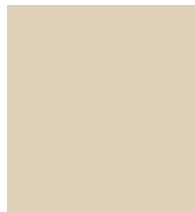
SW 9136  
LULLABY  
SLATE



SW 9131  
CORNWALL  
GREEN



SW 6524  
COMMODORE



SW 9119  
DIRTY  
MARTINI



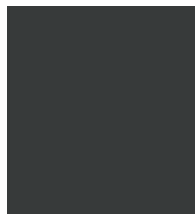
SW 6188  
SHADE  
GROWN



SW 9117  
URBAN  
JUNGLE



SW 6156  
RAMIE



SW 6994  
GREENBLACK  
ACCENT



SW 6717  
LIME RICKEY  
ACCENT



SW 7589  
HABANERO  
CHILE  
ACCENT



SW 70399148  
VIRTUAL  
TAUPE

White may also be used as a primary, trim, or accent color with any palette variations



Elevation A1-R



Elevation A2



Elevation A3-R



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Elevation B1



Elevation B2



Elevation B3-R



Elevation B4



Elevation B5 - R



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Elevation C1



Elevation C2



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY



Elevation D1



Elevation D2



BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





Elevation E1



Elevation E2



Elevation E3 R



BUILDING ELEVATION FOR  
ILLUSTRATIVE PURPOSES ONLY



Elevation F1



Elevation F2-R

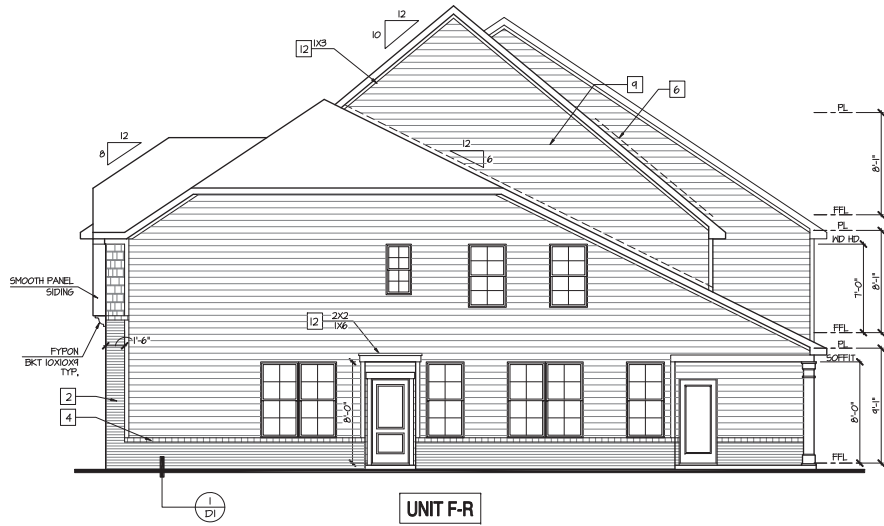


Elevation F3



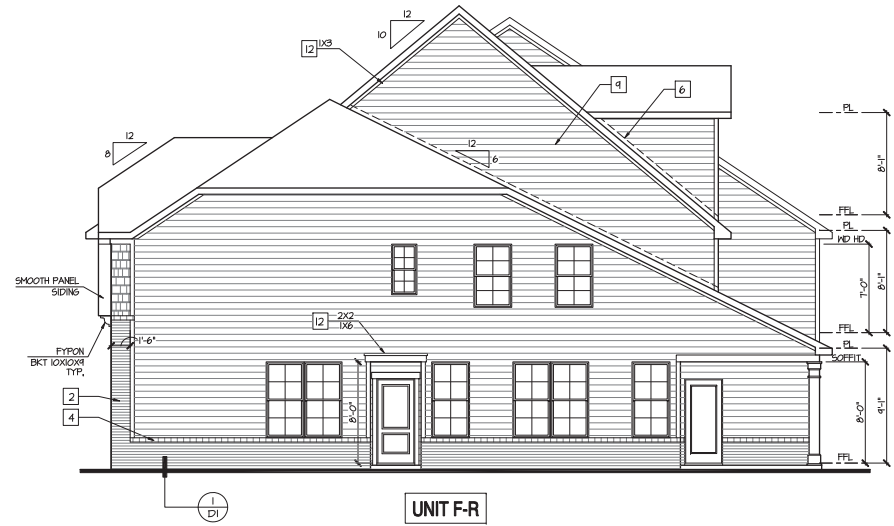
BUILDING ELEVATIONS FOR  
ILLUSTRATIVE PURPOSES ONLY





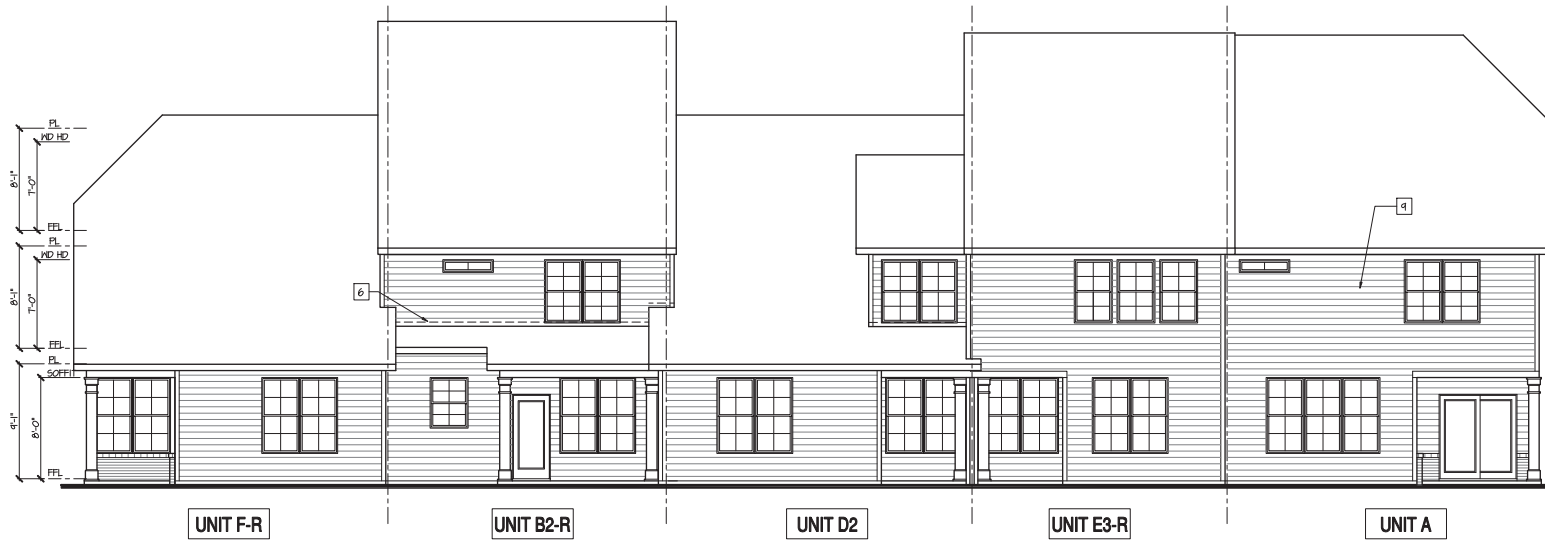
**UNIT F-R**  
Right Elevation 5-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



**UNIT F-R**  
Right Elevation 5-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

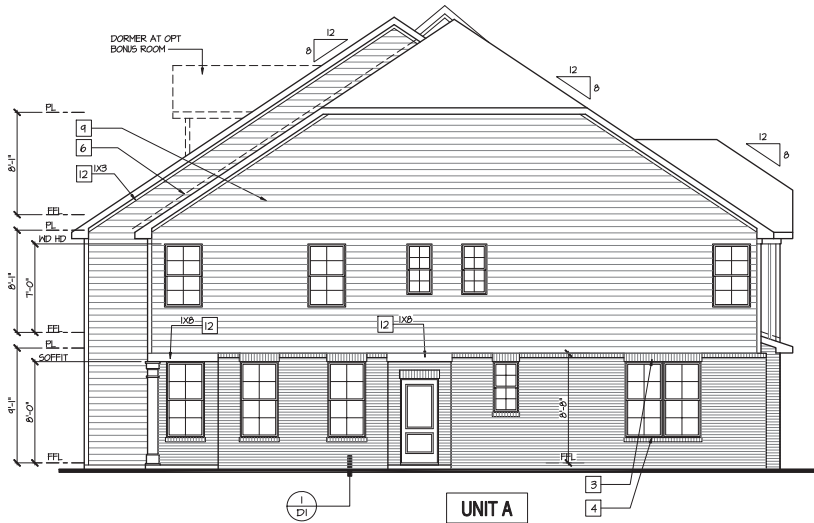


**UNIT F-R**      **UNIT B2-R**      **UNIT D2**      **UNIT E3-R**      **UNIT A**  
Rear Elevation 5-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

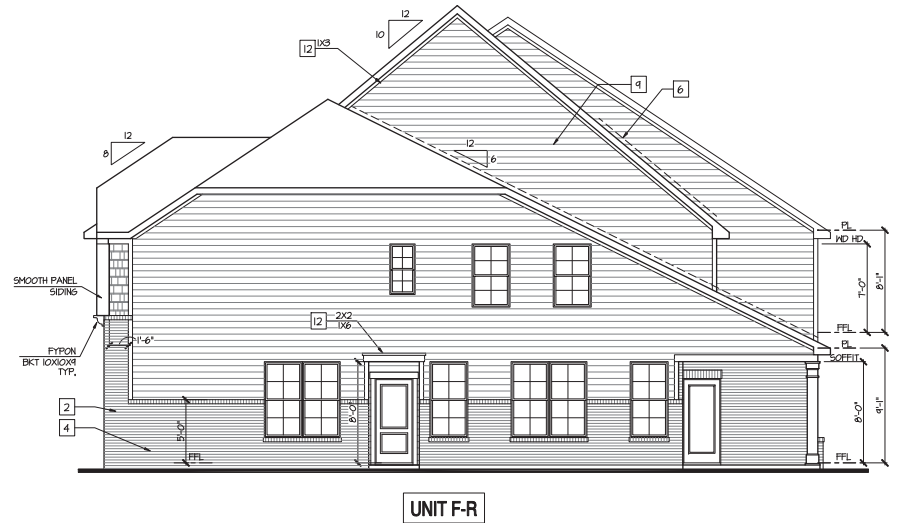


Rear Elevation 5-Plex 'A'  
SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



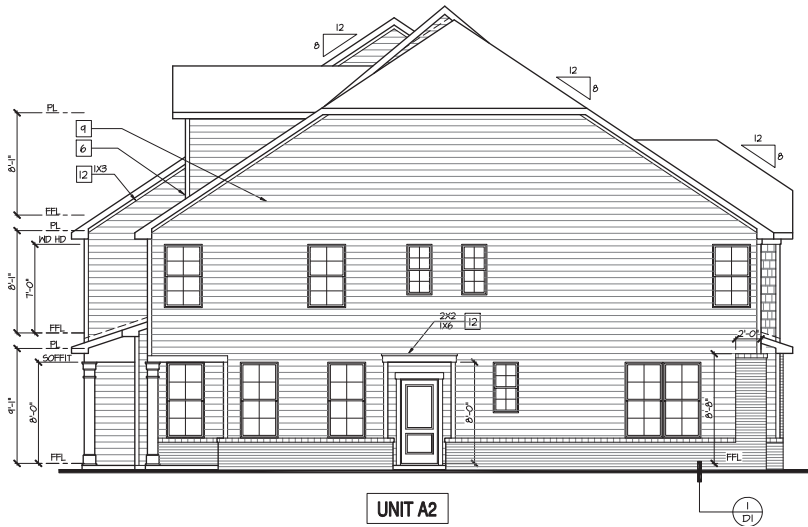
Left Elevation 5-Plex 'A'

SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



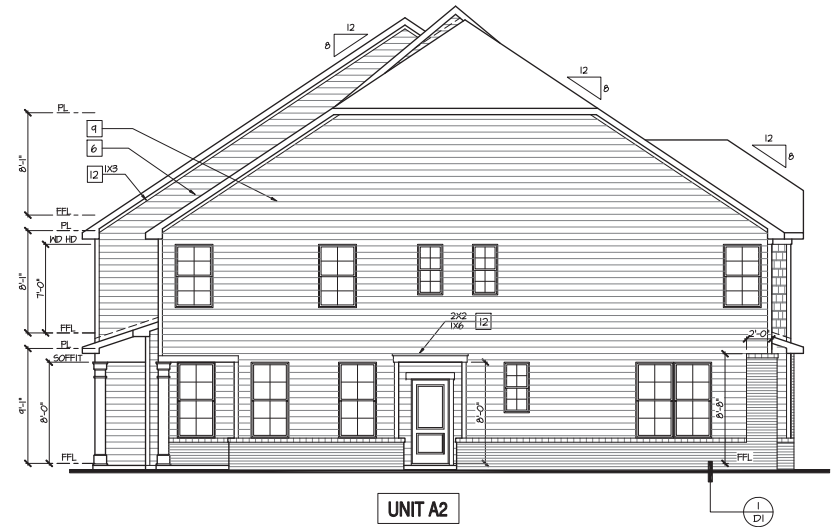
Right Elevation 5-Plex 'A'

SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



UNIT A2  
Left Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



UNIT A2  
Left Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

**NOTES:**

- GRADE CONDITIONS MAY VARY FOR INDIVIDUAL SITE FROM THAT SHOWN. BUILDER SHALL VERIFY AND COORDINATE PER ACTUAL SITE CONDITIONS.
- WINDOW HEAD HEIGHTS:  
1ST FLOOR = 8'-0" UNO, ON ELEVATIONS,  
2ND FLOOR = 7'-0" UNO, ON ELEVATIONS.
- ROOFING: PITCHED SHINGLES PER DEVELOPER.
- WINDOWS: MANUFACTURER PER DEVELOPER, DIVIDED LITES AS SHOWN ON THE EXTERIOR ELEVATIONS.
- ENTRY DOOR, AS SELECTED BY DEVELOPER.
- GARAGE DOORS, AS SELECTED BY DEVELOPER, RAISED PANEL AS SHOWN.
- ALL EXTERIOR MATERIALS TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

**KEY NOTES:**

**MASONRY:**

- ADHERED STONE VENER AS SELECTED BY DEVELOPER, HEIGHT AS NOTED.
- MASONRY FULL BRICK AS SELECTED BY DEVELOPER, HEIGHT AS NOTED.
- 8" SOLDIER COURSE.
- ROCKLOCK COURSE

**TYPICALS:**

- CORROSION RESISTANT SCREEN LOUVERED VENTS, SIZE AS NOTED.
- CORROSION RESISTANT ROOF TO WALL FLASHING, CODE COMPLIANT FLASHING MUST BE INSTALLED AT ALL ROOF/WALL INTERSECTIONS.
- STANDING SEAM METAL ROOF, INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS.

**SIDING:**

- VINYL SHAKE SIDING PER DEVELOPER  
W/ VINYL CORNER.
- VINYL LAP SIDING PER DEVELOPER  
W/ VINYL CORNER.
- VINYL BATT AND BOARD SIDING PER DEVELOPER  
W/ VINYL CORNER.
- VINYL VERTICAL SIDING PER DEVELOPER  
W/ VINYL CORNER.
- 1X SYMBEARD TRIM OR EQUAL, UNO, SIZE AS NOTED.
- 3 1/2" VINYL TRIM (WINDOW JAMBES AND EXTERIOR CORNERS).
- VINYL SHUTTERS, TYPE AS SHOWN, SIZE AS NOTED.



UNIT A2 UNIT B2 UNIT E2 UNIT B3R UNIT A-R  
Front Elevation 5-Plex 'B'

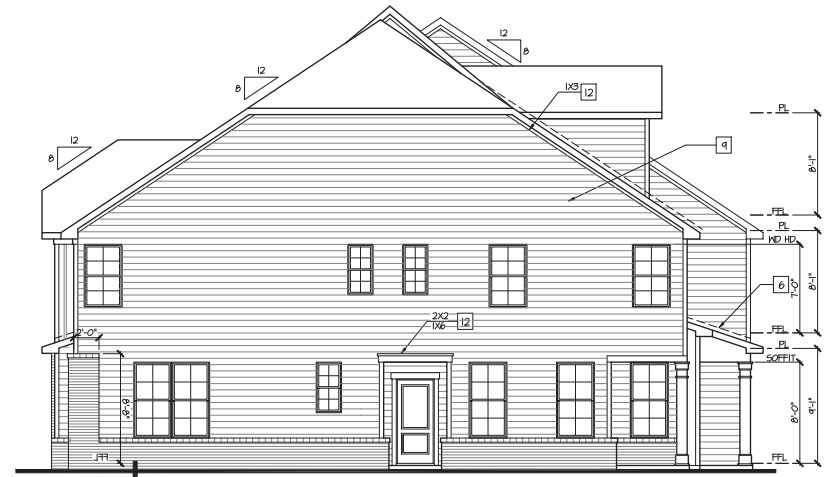
SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

END UNIT EXTERIOR SIDES ONLY,  
SEE EXTERIOR SIDE ELEVATIONS.



UNIT A-R  
Right Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



UNIT A-R  
Right Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

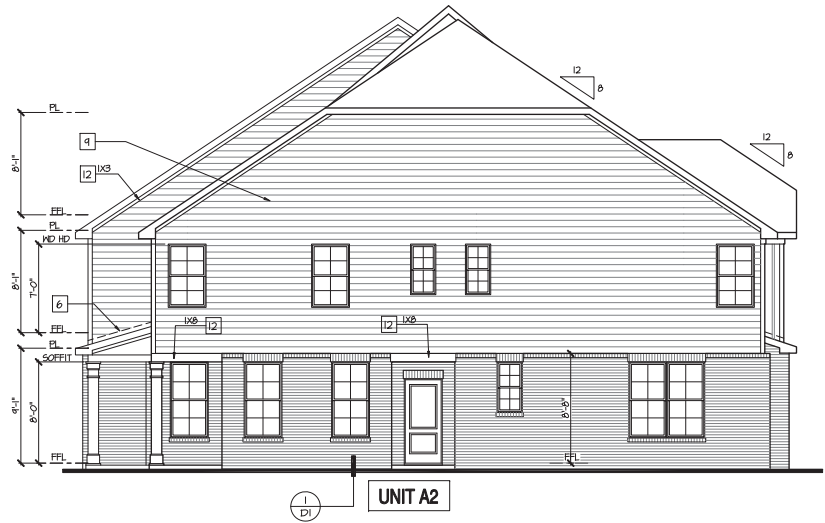


UNIT A-R      UNIT B3R      UNIT E2      UNIT B2      UNIT A2  
Rear Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT

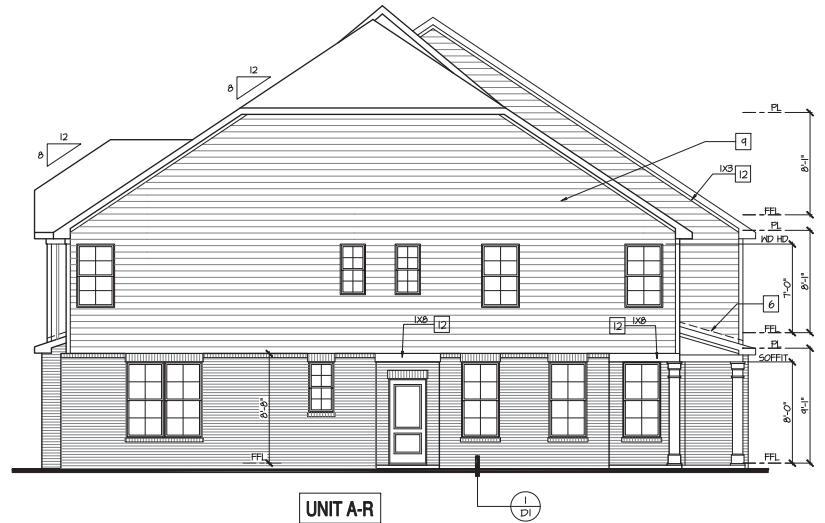


Rear Elevation 5-Plex 'B'  
SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



Left Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT

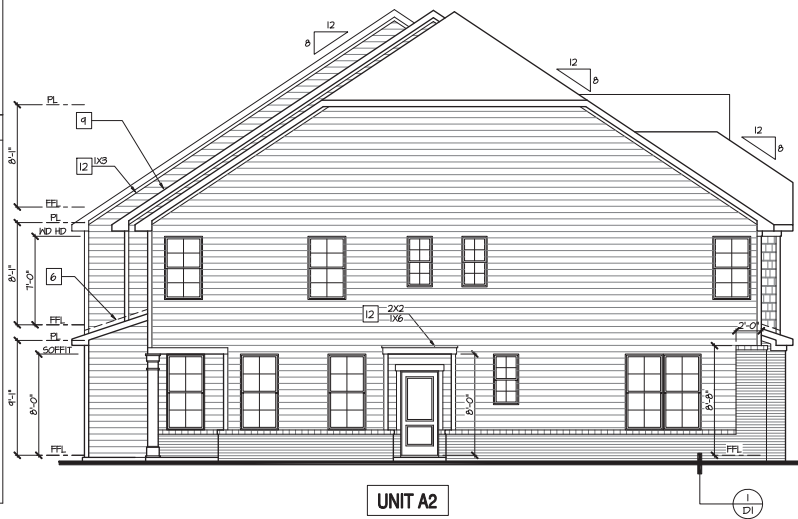


Right Elevation 5-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT

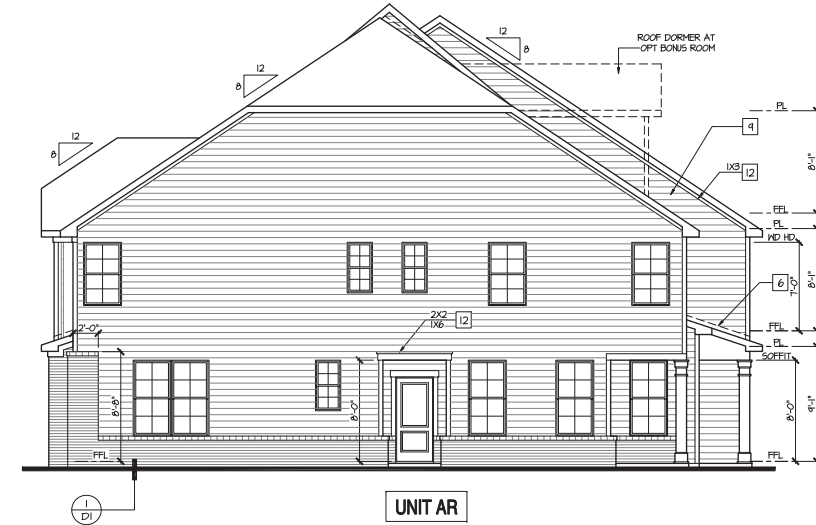


- NOTES:**
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2ND FLOOR = 7'-0" UNO, ON ELEVATIONS.
  - ROOFING: PITCHED SHINGLES PER DEVELOPER.
  - WINDOWS: MANUFACTURER PER DEVELOPER, DIVIDED LITES AS SHOWN ON THE EXTERIOR ELEVATIONS.
  - ENTRY DOORS: AS SELECTED BY DEVELOPER.
  - GARAGE DOORS: AS SELECTED BY DEVELOPER, RAISED PANEL AS SHOWN.
  - ALL EXTERIOR MATERIALS TO BE INSTALLED PER MANUFACTURER'S WRITTEN INSTRUCTIONS.
- KEY NOTES:**
- MASONRY:**
- [1] ADHERED STONE VENEER AS SELECTED BY DEVELOPER, HEIGHT AS NOTED.
  - [2] MASONRY FULL BRICK AS SELECTED BY DEVELOPER, HEIGHT AS NOTED.
  - [3] 8" SOLDIER COURSE.
  - [4] RAINLOCK COURSE.
- TYPICALS:**
- [5] CORROSION RESISTANT SCREEN COVERED VENTS, SIZE AS NOTED.
  - [6] CORROSION RESISTANT ROOF TO WALL FLASHING, CODE COMPLIANT FLASHING MUST BE INSTALLED AT ALL ROOF/WALL INTERSECTIONS.
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- SIDING:**
- [8] VINYL SHAKE SIDING PER DEVELOPER
  - [9] VINYL CORNER,
  - [10] VINYL LAP SIDING PER DEVELOPER
  - [11] VINYL CORNER,
  - [12] VINYL BATT AND BOARD SIDING PER DEVELOPER
  - [13] VINYL CORNER,
  - [14] VINYL VERTICAL SIDING PER DEVELOPER
  - [15] VINYL CORNER,
  - [16] 1X SYNBOARD TRIM OR EQUAL, UNO, SIZE AS NOTED
  - [17] 3 1/2" VINYL TRIM (WINDOW JAMBS AND EXTERIOR CORNERS)
  - [18] VINYL SHUTTERS, TYPE AS SHOWN, SIZE AS NOTED.



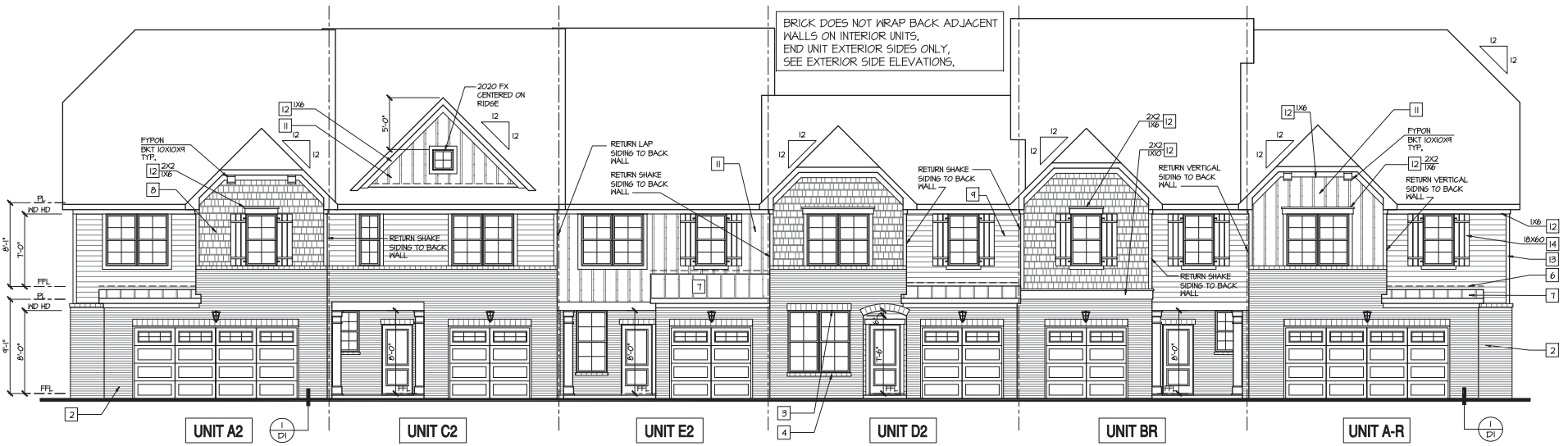
UNIT A2  
Left Elevation 6-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



UNIT AR  
Right Elevation 6-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



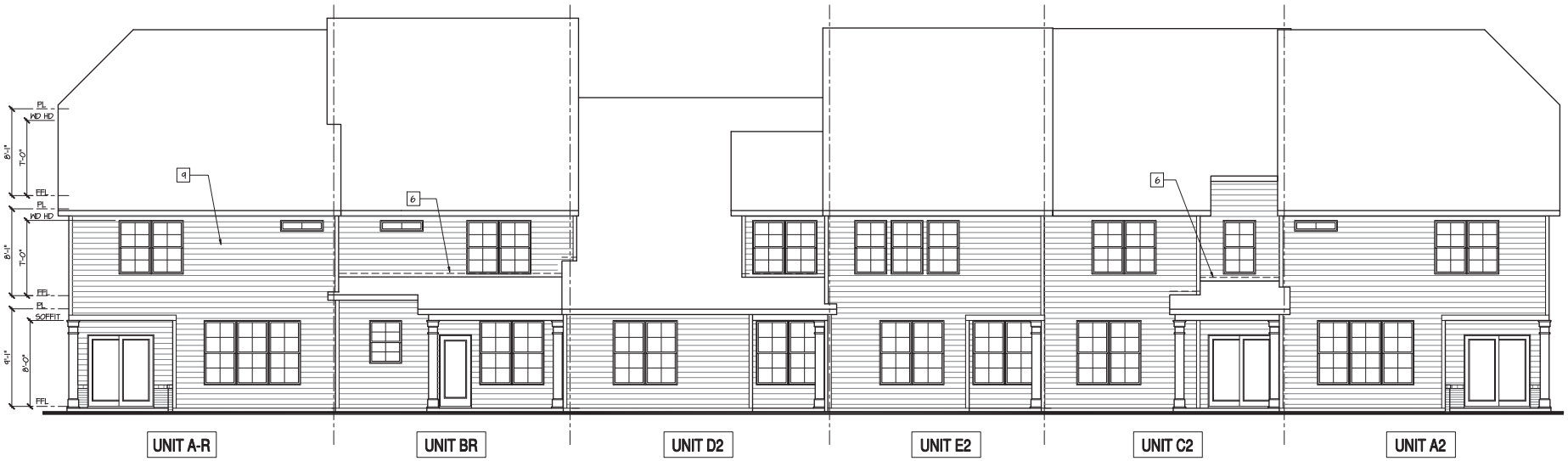
UNIT A2 UNIT C2 UNIT E2 UNIT D2 UNIT BR UNIT A-R  
Front Elevation 6-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



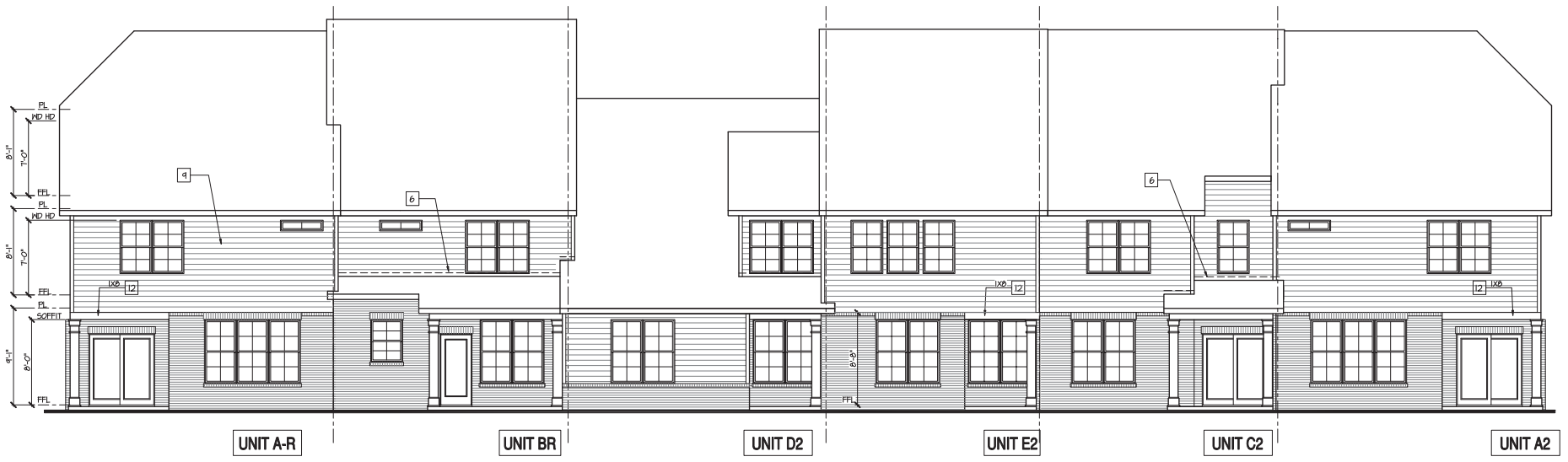
Rear Elevation

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



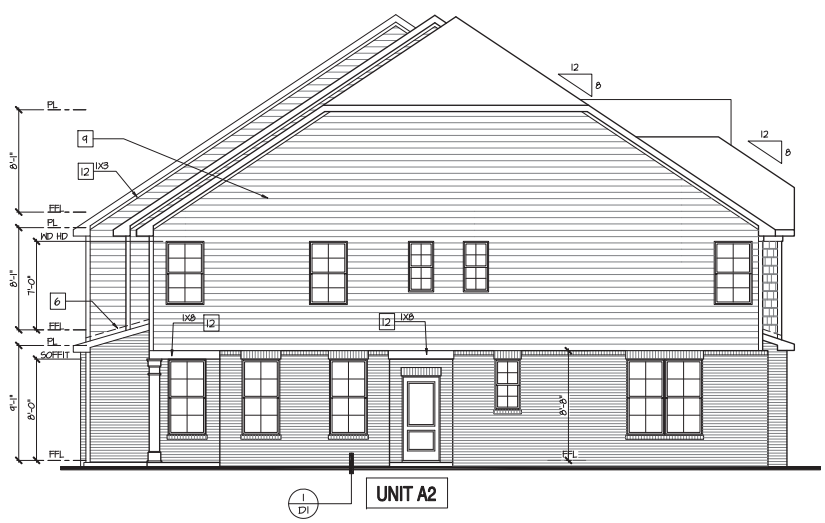
Rear Elevation 6-Plex 'A'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



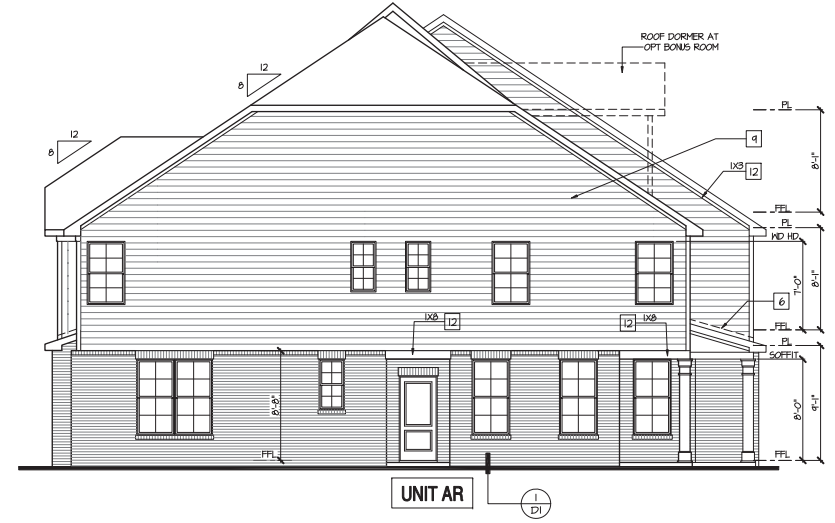
Rear Elevation 6-Plex 'A'

SCALE: 3/16"=1'-0" AT 22'X34' LAYOUT



Left Elevation 6-Plex 'A'

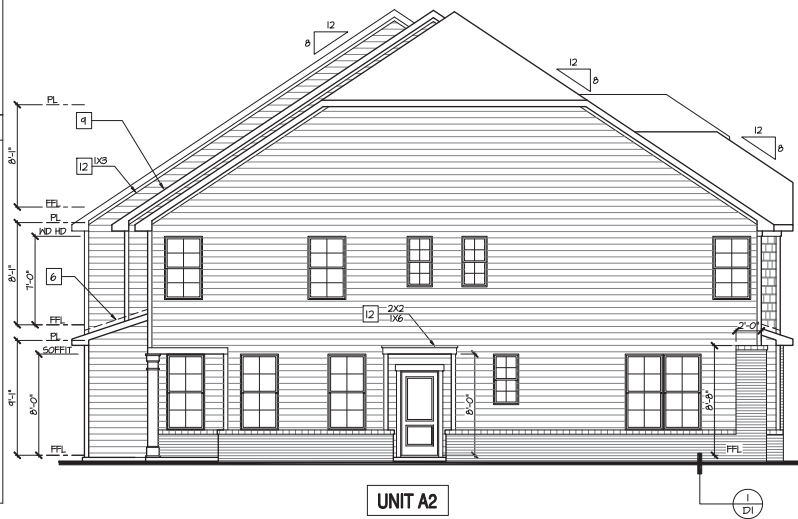
SCALE: 3/16"=1'-0" AT 22'X34' LAYOUT



Right Elevation 6-Plex 'A'

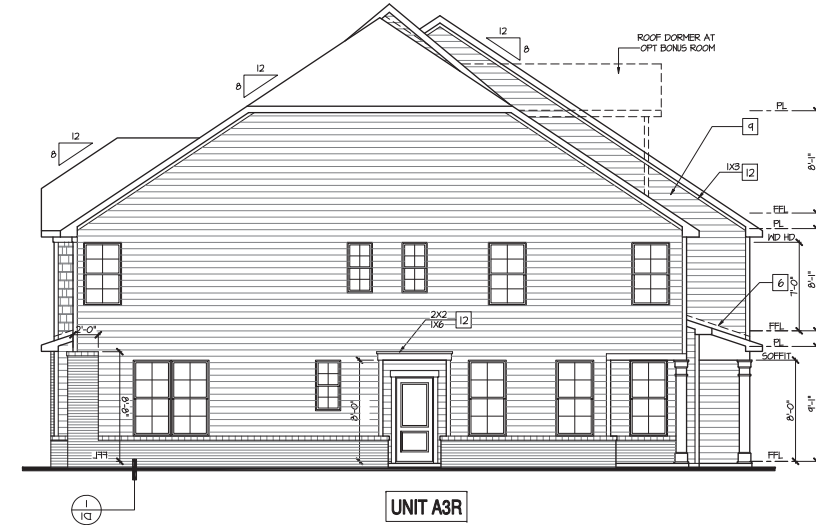
SCALE: 3/16"=1'-0" AT 22'X34' LAYOUT

- NOTES:**
- GRADE CONDITIONS MAY VARY FOR INDIVIDUAL SITE FROM THAT SHOWN. BUILDER SHALL VERIFY AND COORDINATE PER ACTUAL SITE CONDITIONS.
  - WINDOW HEAD HEIGHTS:  
1ST FLOOR = 8'-0" UNO, ON ELEVATIONS,  
2ND FLOOR = 7'-0" UNO, ON ELEVATIONS.
  - ROOFING: PITCHED SHINGLES PER DEVELOPER.
  - WINDOWS: MANUFACTURER PER DEVELOPER, DIVIDED LITES AS SHOWN ON THE EXTERIOR ELEVATIONS.
  - ENTRY DOORS: AS SELECTED BY DEVELOPER.
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- [5] CORROSION RESISTANT SCREEN COVERED VENTS, SIZE AS NOTED.
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  - [14] VINYL VERTICAL SIDING PER DEVELOPER
  - [15] VINYL CORNER,
  - [16] 1X SYNBORD TRIM OR EQUAL, UNO, SIZE AS NOTED
  - [17] 3 1/2" VINYL TRIM (WINDOW JAMBS AND EXTERIOR CORNERS)
  - [18] VINYL SHUTTERS, TYPE AS SHOWN, SIZE AS NOTED.



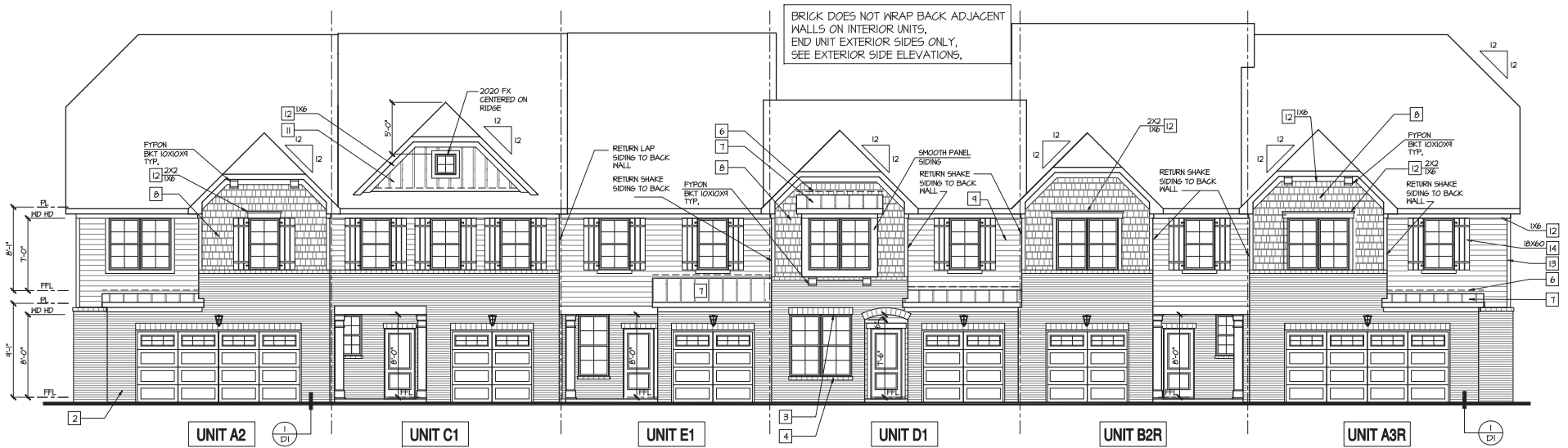
UNIT A2  
Left Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



UNIT A3R  
Right Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



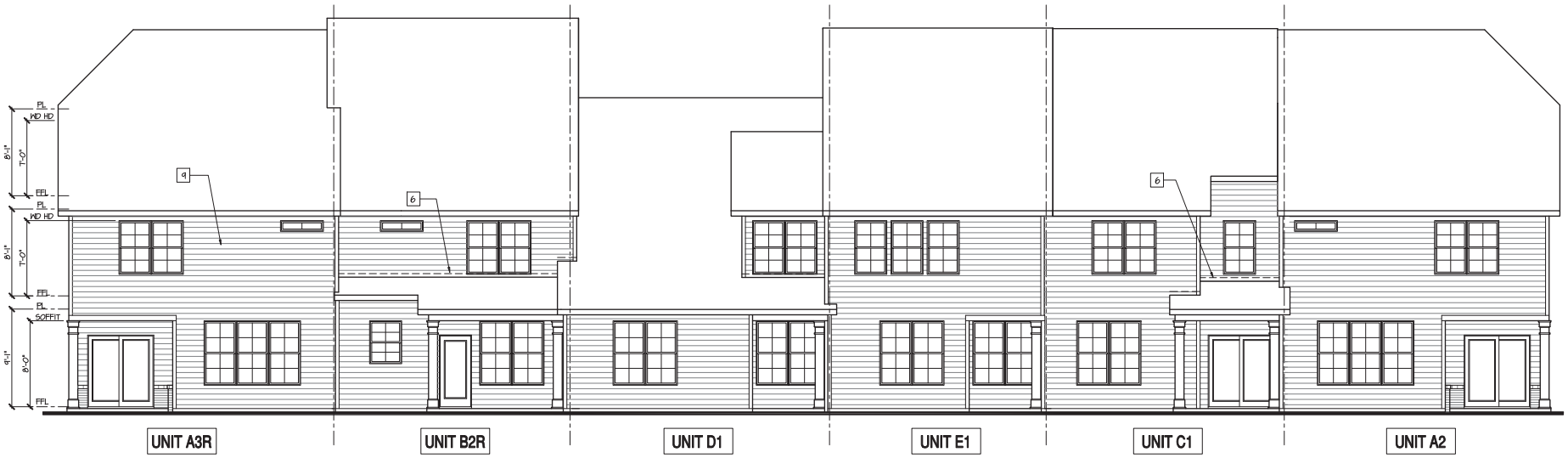
Front Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"x34" LAYOUT



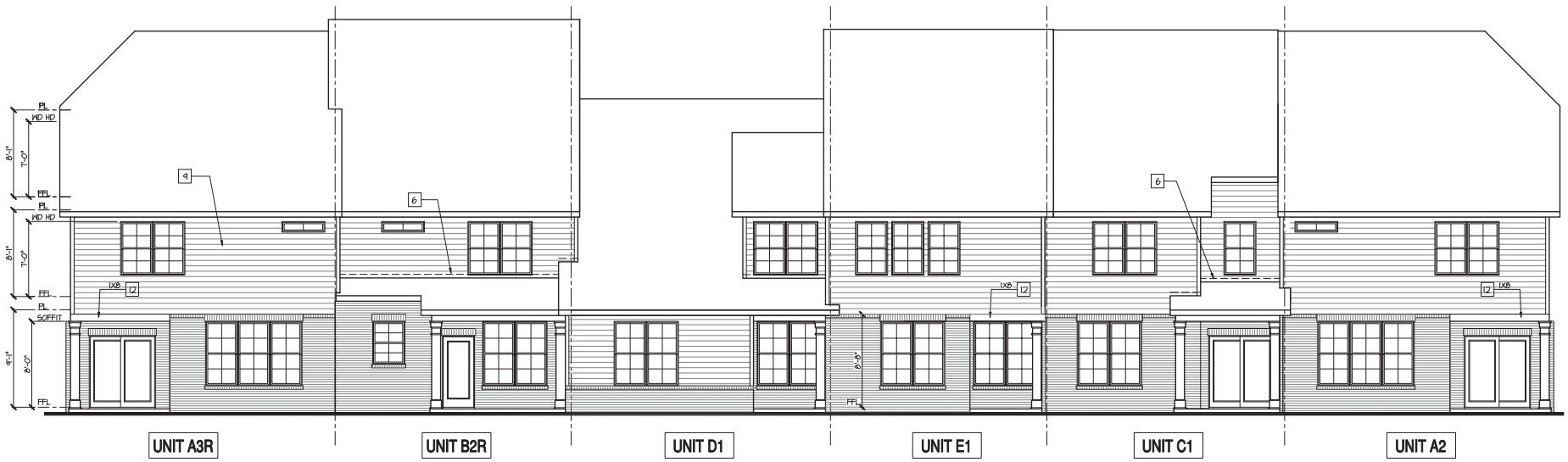
Rear Elevation

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



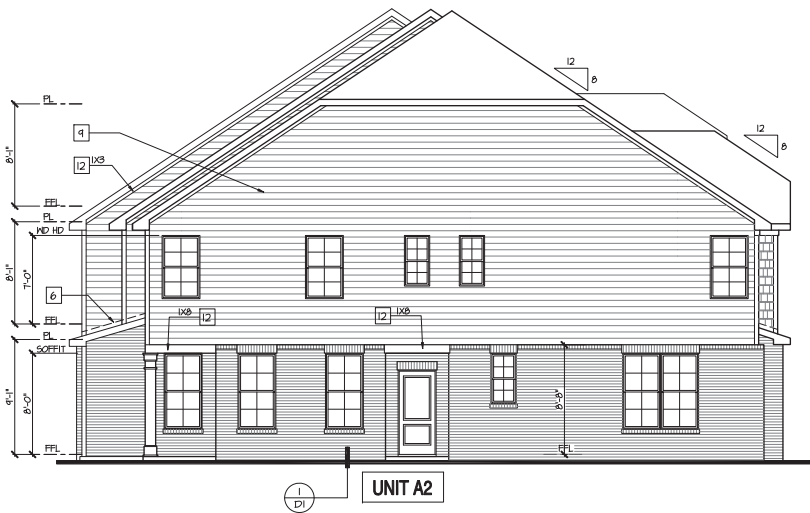
Rear Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



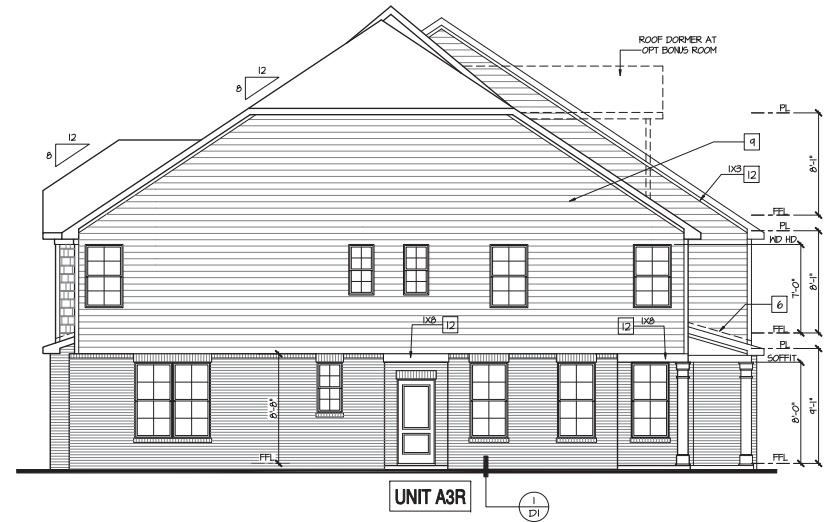
Rear Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



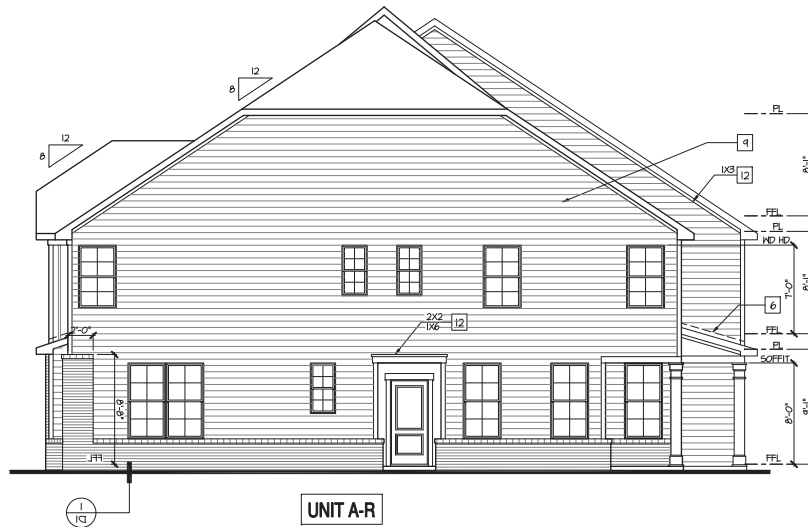
Left Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



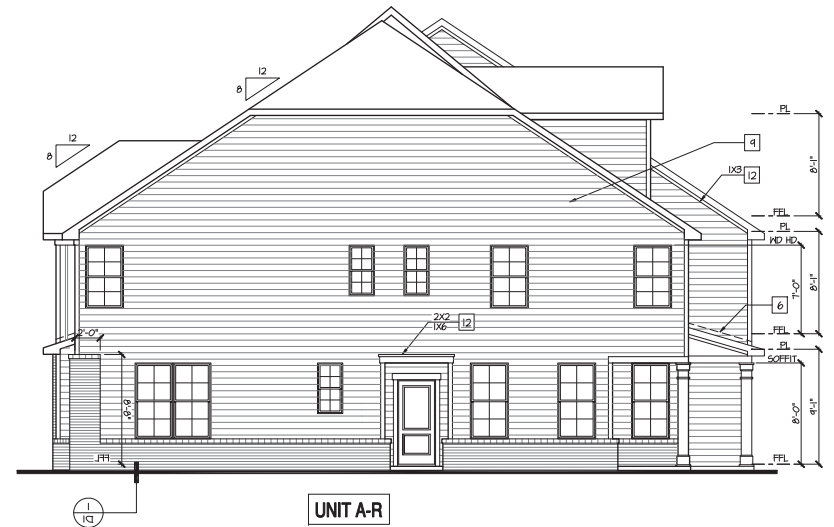
Right Elevation 6-Plex 'B'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



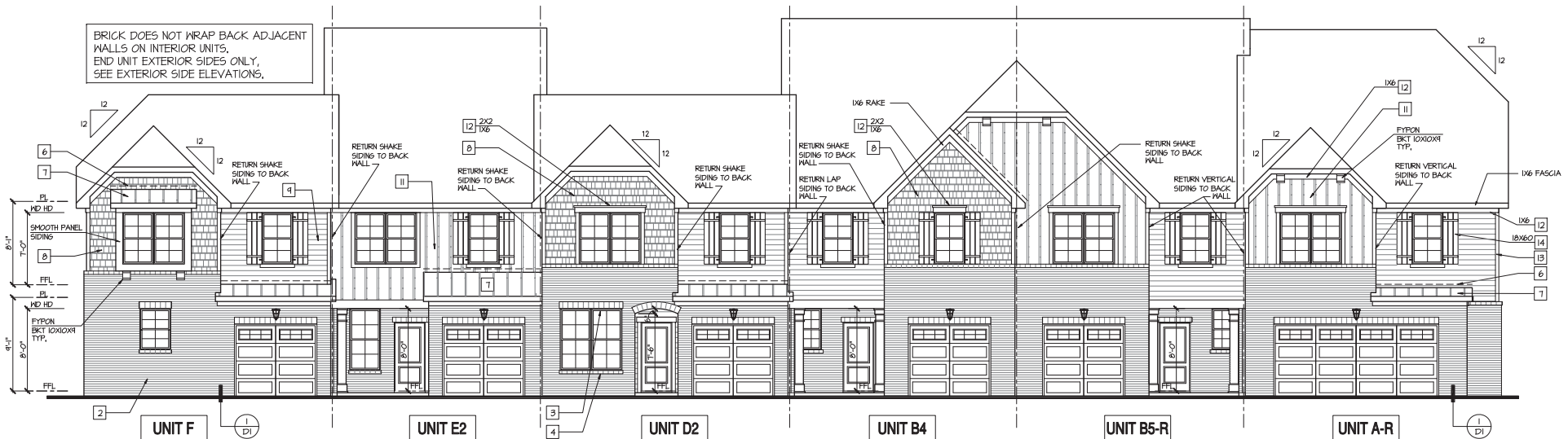
UNIT A-R  
Right Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



UNIT A-R  
Right Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



Front Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22"X34" LAYOUT



UNIT A-R

Right Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



UNIT F

Left Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



UNIT A-R

UNIT B5-R

UNIT B4

UNIT D2

UNIT E2

UNIT F

Rear Elevation 6-Plex 'C'

SCALE: 3/16"=1'-0" AT 22'X34" LAYOUT



## APARTMENT BUILDING ELEVATIONS

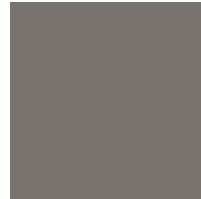
### Apartment standards:

1. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
2. Siding materials shall be varied in type and/or color on 30% of each façade on each building.
3. Windows must vary in size and/or type.
4. Windows that are not recessed must be trimmed.
5. Recesses and projections shall be provided for at least 50% of each façade on each building.
6. Rooflines cannot be a single mass; they must be varied with the use of gables or parapets.
7. Garage doors must have windows, decorative details or carriage-style adornments.
8. At least three of the following decorative features shall be used on each building:
  - Decorative shake
  - Board and batten
  - Decorative porch railing/posts
  - Shutters
  - Decorative/functional air vents on roof or foundation
  - Recessed windows
  - Decorative windows
  - Decorative brick/stone
  - Decorative gables
  - Decorative cornices
  - Tin/metal roof
9. A varied color palette shall be utilized for the apartment buildings throughout the development. With garden style apartments, a minimum of three color families for siding shall be provided and will include varied trim, shutter, and accent colors complementing the siding color. For a single mass apartment structure, the color shall vary with accent colors or architectural features to provide building relief.
10. Breezeway(s) for the four story apartment elevation is to be enclosed for additional mechanical equipment or elevators.

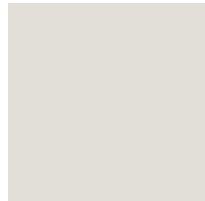
Apartment Color Palette (Sherwin Williams)  
All colors are Primary with the exception of those noted



SW 6117  
SMOKEY  
TOPAZ



SW 7019  
GAUNTLET  
GRAY



SW 7014  
ELDER WHITE



SW 7024  
FUNCTIONAL GRAY



SW 6242  
BRACING BLUE



SW 6524  
COMMODORE



SW 6761  
THERMAL  
SPRING  
(ACCENT)



SW 6871  
POSITIVE  
RED  
(ACCENT)

White may also be used as a primary, trim, or accent color with any palette variations



PRELIMINARY BUILDING ELEVATION  
FOR ILLUSTRATIVE PURPOSES ONLY

PRELIMINARY BUILDING ELEVATIONS  
FOR ILLUSTRATIVE PURPOSES ONLY



**Front Elevation**



**Rear Elevation**



**Typ. Side Elevation**



ARCHITECTURAL CLASS
EXTERIOR MATERIALS
• ASPHALT SHINGLE ROOF
• STANDING SEAM METAL ROOF
• FIBER CEMENT SIDING
• FIBER CEMENT PANELS
• BRICK PER BUILDER
• BRICK ROLLOCK-SOLDER PER BUILDER
• CULTURED STONE VENEER

1 FRONT ELEVATION  
Scale: 1/8" = 1'-0"

PRELIMINARY BUILDING ELEVATIONS  
FOR ILLUSTRATIVE PURPOSES ONLY



2 TYPICAL SIDE ELEVATION  
Scale: 1/8" = 1'-0"

PRELIMINARY BUILDING ELEVATIONS  
FOR ILLUSTRATIVE PURPOSES ONLY



# Traffic Impact Analysis Update Horton Park Apex, NC



# TRAFFIC IMPACT ANALYSIS UPDATE

FOR

## HORTON PARK

LOCATED

IN

## APEX, NORTH CAROLINA

Prepared For:  
MFW Investments, LLC

Prepared By:  
Ramey Kemp & Associates, Inc.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
License #C-0910

July 2019

RKA Project No. 19203



Prepared By: NAB

Reviewed By: JTR



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- Appendix C: Signal Plans
- Appendix D: Adjacent Development / Background Improvement Information
- Appendix E: Capacity Calculations – Ten-Ten Road and Smith Road
- Appendix F: Capacity Calculations – NC 55 / NC 55 Bypass and Technology Drive / E. Williams Street
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**TRAFFIC IMPACT ANALYSIS UPDATE**  
**HORTON PARK**  
**APEX, NORTH CAROLINA**

**1. INTRODUCTION**

The contents of this report present the findings of the Traffic Impact Analysis (TIA) Update conducted for the proposed Horton Park development to be located between Smith Road and E. Williams Street, south of Ten-Ten Road in Apex, North Carolina. The purpose of this study is to determine the potential impacts to the surrounding transportation system created by traffic generated by the proposed development, as well as recommend improvements to mitigate the impacts. Phase 1 of the development is expected to provide site access via connections to Dezola Street to the east and Colby Chase Drive to the west. Under Full Buildout, the development is expected to provide additional site access via three (3) full movement driveways on Jessie Drive Extension.

The proposed development is expected to be constructed in two (2) phases with Phase 1 anticipated to be completed in 2024 and Full Buildout in 2026. Phase 1 of the development is assumed to consist of the following uses:

- 290 single-family detached homes
- 134 townhomes

Full Buildout of the development is assumed to consist of the following uses:

- 290 single-family detached homes
- 212 townhomes
- 356 apartments
- 40,000 square feet (s.f.) of warehouse
- 40,000 s.f. of business park

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Existing (2019) Traffic Conditions

- Background (2024) Traffic Conditions
- Background (2026) Traffic Conditions
- Combined (2024) Traffic Conditions – Phase 1
- Combined (2026) Traffic Conditions – Full Buildout

### **1.1. Site Location and Study Area**

The development is proposed to be located between Smith Road and E. Williams Street, south of Ten-Ten Road in Apex, North Carolina. Refer to Figure 1 for the site location map.

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT) and the Town of Apex (Town) and consists of the following existing intersections:

- Ten-Ten Road and Smith Road
- Smith Road and Stephenson Road
- Smith Road and Dezola Street
- E. Williams Street and Straywhite Avenue
- NC 55 and Technology Drive / E. Williams Street
- Ten-Ten Road and Jessie Drive (Full Buildout scenarios only)
- NC 55 and Jessie Drive Extension (Full Buildout scenarios only)
- NC 55 and Jessie Drive Extension Northbound U-Turn Location (Full Buildout scenarios only)

Refer to Appendix A for the Memorandum of Understanding (MOU) approved by NCDOT and the Town.

### **1.2. Proposed Land Use and Site Access**

The proposed development is expected to be constructed in two (2) phases with Phase 1 anticipated to be completed in 2024 and Full Buildout in 2026. Phase 1 of the development is assumed to consist of the following uses:

- 290 single-family detached homes
- 134 townhomes

Full Buildout of the development is assumed to consist of the following uses:

- 290 single-family detached homes
- 212 townhomes
- 356 apartments
- 40,000 square feet (s.f.) of warehouse
- 40,000 s.f. of business park

Phase 1 of the development is expected to provide site access via connections to Dezola Street to the east and Colby Chase Drive to the west. Under Full Buildout, the development is expected to provide additional site access via three (3) full movement driveways on Jessie Drive Extension.

Refer to Figure 2 for a copy of the most recent preliminary site plan.

### **1.3. Adjacent Land Uses**

The proposed development is located in an area consisting primarily of undeveloped land, residential, and industrial developments.

### **1.4. Existing Roadways**

Existing lane configurations (number of traffic lanes on each intersection approach), lane widths, storage capacities, and other intersection and roadway information was collected through field reconnaissance by Ramey Kemp & Associates, Inc. (RKA). Table 1 provides a summary of the field data collected. Refer to Figure 3 for an illustration of the existing lane configurations within the study area.

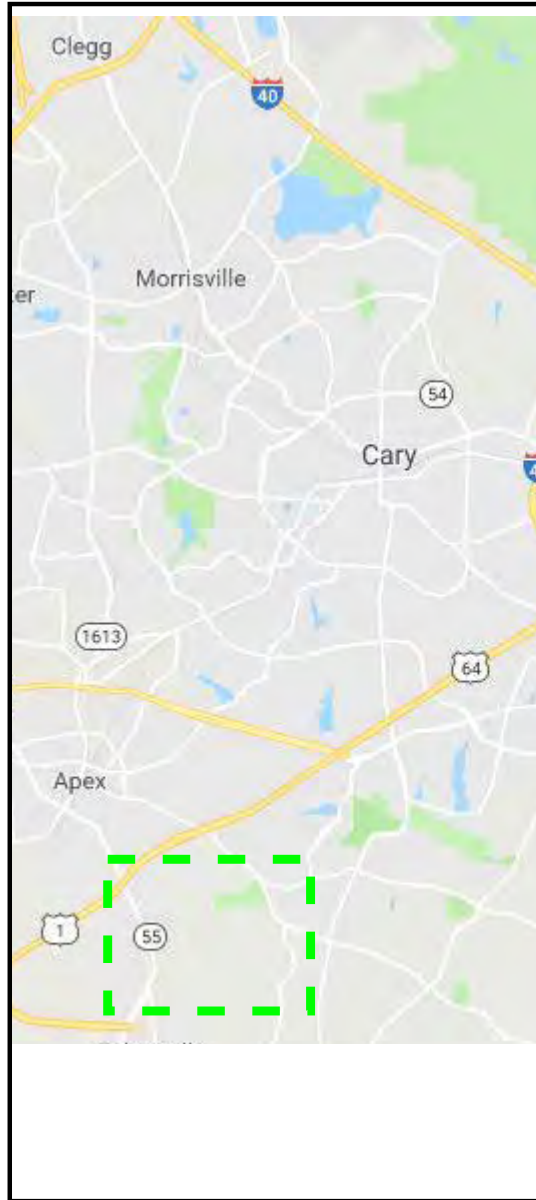
**Table 1: Existing Roadway Inventory**

Road Name	Route Number	Typical Cross Section	Speed Limit	Maintained By	2017 AADT (vpd)
Ten-Ten Road	SR 1010	2-lane undivided	45 mph	NCDOT	22,000
Smith Road	SR 1303	2-lane undivided	35 mph	NCDOT	8,200*
Stephenson Road	SR 1302	2-lane undivided	35 mph	NCDOT	4,900**
Dezola Street	N/A	2-lane undivided	25 mph (assumed)	Private	100*
Jessie Drive	SR 1304	2-lane undivided	35 mph	NCDOT	300*
Straywhite Avenue	N/A	2-lane undivided	25 mph	Town	1,700*
E. Williams Street	NC-55	2-lane undivided	45 mph	NCDOT	13,000
NC 55	NC 55	4-lane divided	45 mph	NCDOT	43,000
NC 55 Bypass	NC 55 Byp	4-lane divided	55 mph	NCDOT	29,000
Technology Drive	SR 1191	2-lane undivided	45 mph (assumed)	NCDOT	1,500*

\* ADT based on the existing (2019) peak hour traffic volumes and assuming the weekday PM peak hour volume is 10% of the average daily traffic.

\*\*2015 ADT data from NCDOT.





**LEGEND**

- - - Proposed Site Location
- - - Study Area
- Study Intersection



Horton Park Update  
Apex, NC

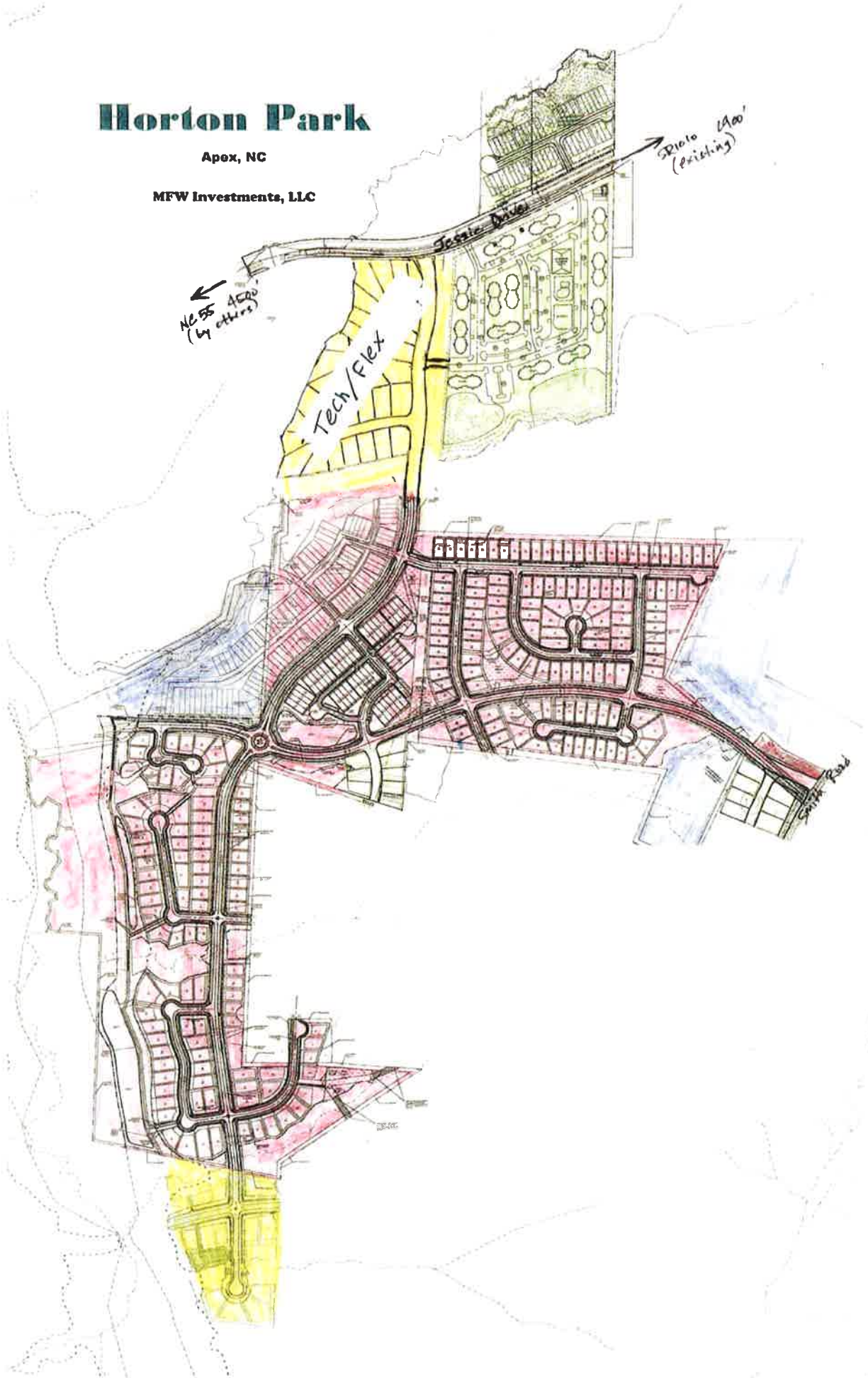
Site Location Map

Scale: Not to Scale	Figure 1
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# Horton Park

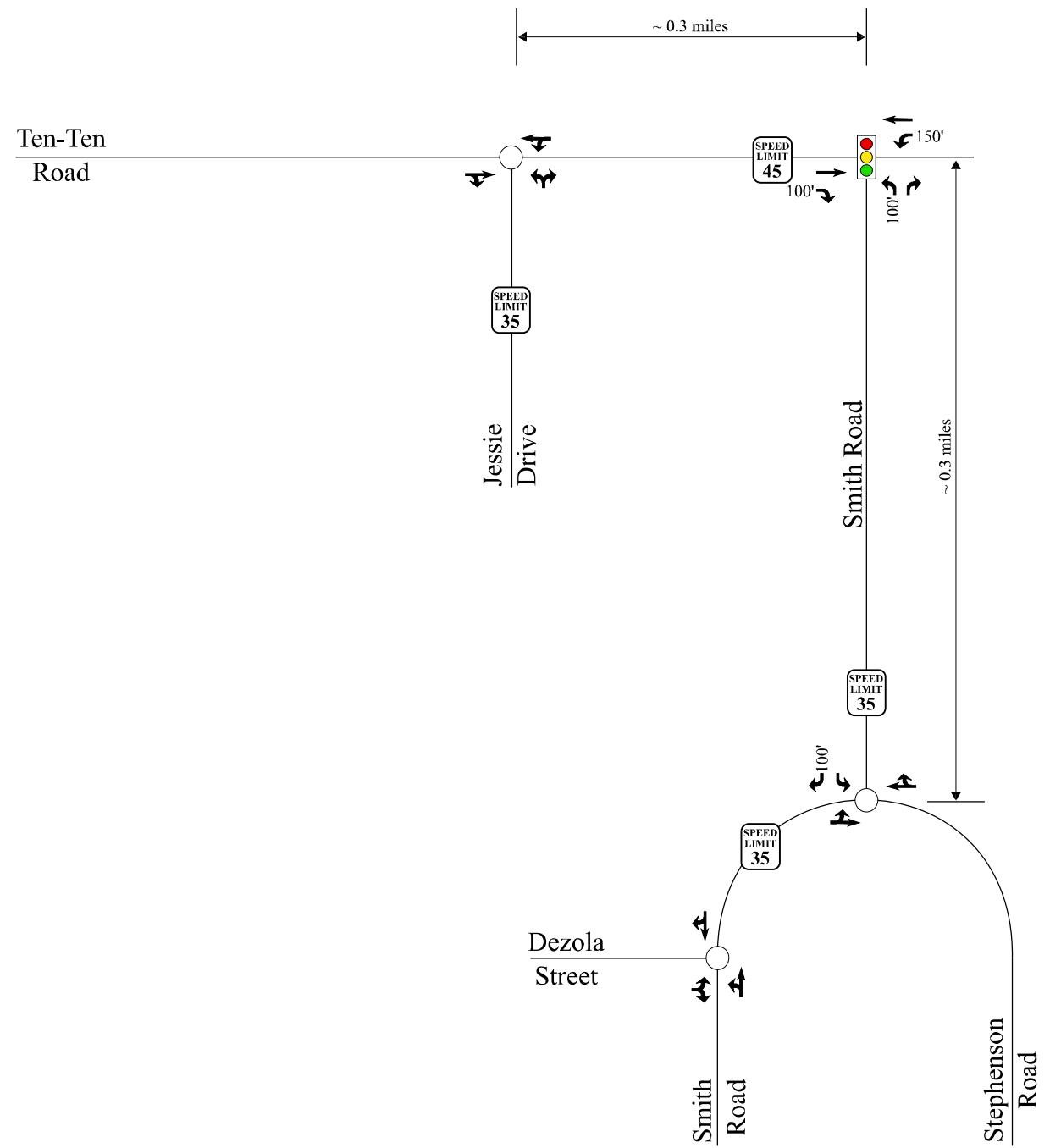
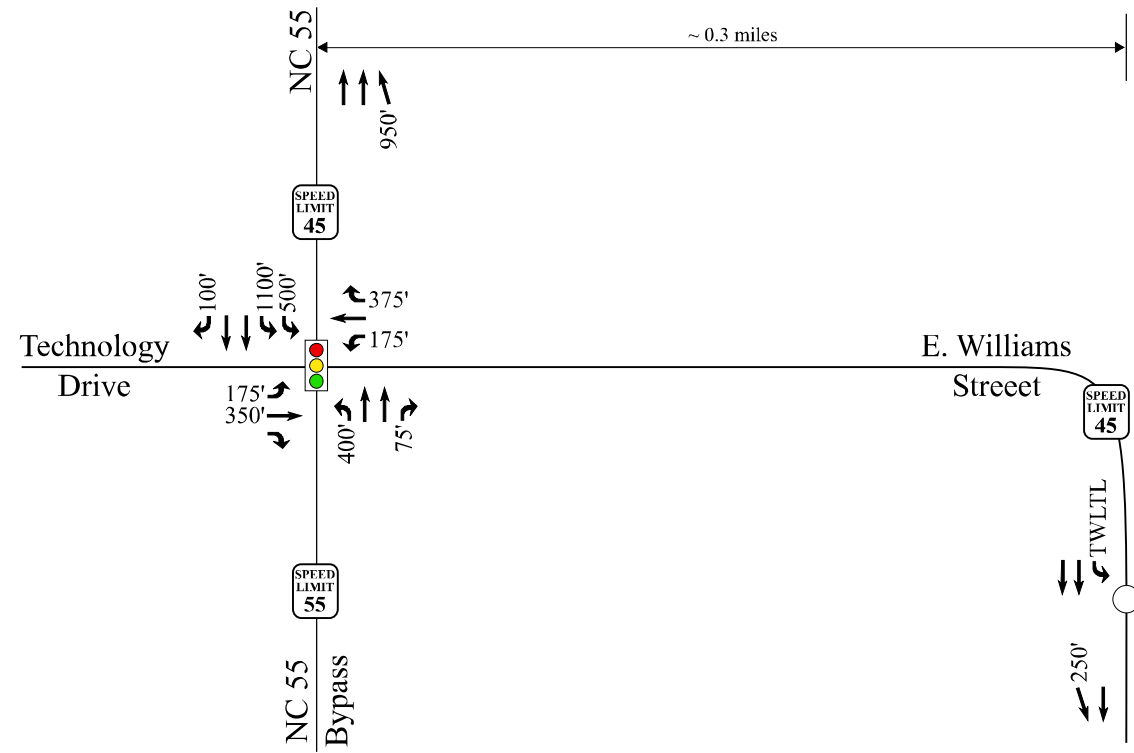
Apex, NC

MFW Investments, LLC



**LEGEND**

- Unsignalized Intersection
- ⬆️⬆️⬆️ Signalized Intersection
- ➔ Existing Lane
- TWLTL Two-Way Left-Turn Lane
- X' Storage (In Feet)
- Posted Speed Limit



 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Existing Lane Configurations</p>
	<p>Scale: Not to Scale</p>	<p>Figure 3</p>

## **2. EXISTING (2019) PEAK HOUR CONDITIONS**

### **2.1. Existing (2019) Peak Hour Traffic**

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in May of 2017 and March of 2016 by RKA and Gannet Flemming during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

- Ten-Ten Road and Jessie Drive
- Ten-Ten Road and Smith Road
- Smith Road and Stephenson Road
- Smith Road and Dezola Street
- Technology Drive / E. Williams Street and NC 55

The traffic volumes at the intersection of E. Williams Street and Straywhite Avenue were determined via trip generation and through volumes were pulled from the Bobbit Road and E. Williams Street intersection, per the methodology included in the original Horton Park TIA and TIA Addendums.

In order to project the 2016 and 2017 traffic counts to 2019 conditions, a 3% annually compounded growth rate was used to grow these volumes 3 and 2 years, respectively. The count methodology above was reviewed and approved by NCDOT and the Town.

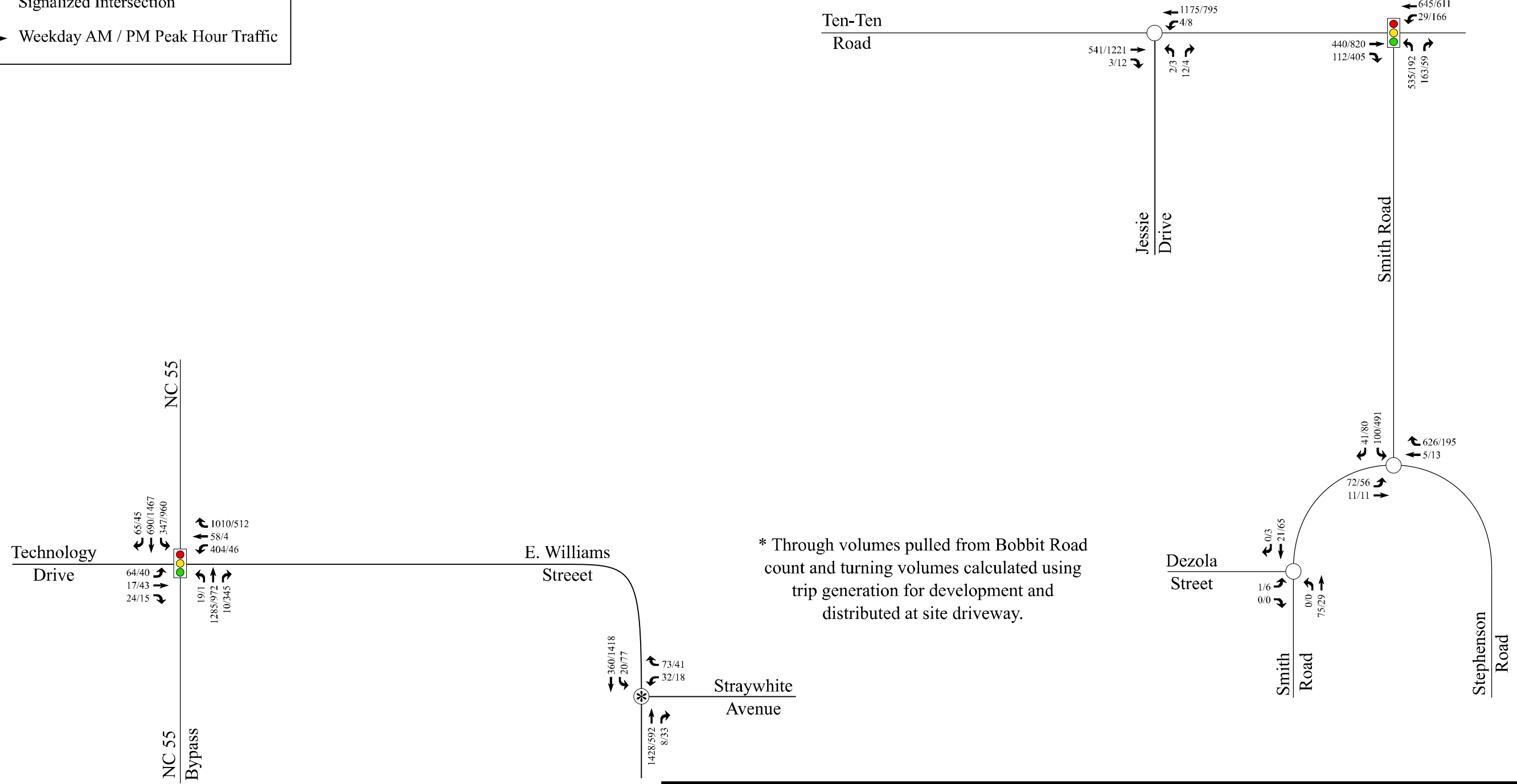
Traffic volumes were balanced between study intersections, where appropriate. Refer to Figure 4 for existing (2019) weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.


### **2.2. Analysis of Existing (2019) Peak Hour Traffic**

The existing (2019) weekday AM and PM peak hour traffic volumes were analyzed to determine the current levels of service at the study intersections under existing roadway conditions. Signal information was obtained from NCDOT and field reconnaissance and is included in Appendix C. The results of the analysis are presented in Section 7 of this report.

**LEGEND**

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



	Horton Park Update Apex, NC		Existing (2019) Peak Hour Traffic Volumes	
			Scale: Not to Scale	Figure 4

### **3. BACKGROUND (2024/2026) PEAK HOUR CONDITIONS**

In order to account for growth of traffic and subsequent traffic conditions at a future year, background traffic projections are needed. Background traffic is the component of traffic due to the growth of the community and surrounding area that is anticipated to occur regardless of whether or not the proposed development is constructed. Background traffic is comprised of existing traffic growth within the study area and additional traffic created as a result of adjacent approved developments.

#### **3.1. Ambient Traffic Growth**

Through coordination with the Town and NCDOT, it was determined that an annually compounded growth rate of 3% would be used to generate projected (2024 and 2026) weekday AM and PM peak hour traffic volumes. Refer to Figures 5A and 5B for projected (2024) and projected (2026) peak hour traffic, respectively.

#### **3.2. Adjacent Development Traffic**

Through coordination with the Town, Empire Estates at Apex 55 (Stop & Go Gas Station) was identified to be included as an adjacent development in this study. This development is summarized below.

Empire Estates at Apex 55 (Stop & Go Gas Station) is a commercial development expected to consist of approximately 1,800 s.f. of retail and a gas station with 16 fueling positions with an anticipated buildout year of 2017. An approved TIA was conducted by Timmons Group in November 2015. The Empire Estates at Apex 55 development is located in the southeast quadrant of the intersection of E. Williams Street and NC 55 / NC 55 Bypass in Apex, NC.

Adjacent development trips are shown in Figure 6. Additional adjacent development information can be found in Appendix D.

#### **3.3. Future Roadway Improvements**

Based on coordination with the NCDOT and the Town, it was determined that the Jessie Drive Extension would be included in the background (2026) and combined (2026) analysis because this improvement is expected to apply for LAPP funding in 2021 and be constructed in 2024.

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Phase 1 of the development is not expected to have any connection to Jessie Drive; therefore, this improvement / intersections are only included under Full Buildout conditions. As this roadway is not yet designed, laneage was assumed per coordination with Town staff. It was assumed that Jessie Drive will be constructed as a two-lane roadway with turn-lanes on both the northern (Ten-Ten Road) and southern (NC 55) extents. To account for the background traffic volumes that are expected to be shifted to this roadway with completion of its extension, assumptions were made similar to the original Horton Park TIA and diverted traffic was calculated.

The NCDOT TIP project U-5825B is expected to be completed along Ten-Ten Road between Reliance Avenue and Kildaire Farm Road by the buildout of Phase 1 of the Horton Park development. This project is currently in the design phase; however, preliminary design concepts were utilized for background laneage assumptions.

Refer to Figure 7 for the diverted traffic volumes due to the Jessie Drive Extension. Appendix D provides additional information pertaining to the background roadway improvements included in this study.

### **3.4. Background (2024/2026) Peak Hour Traffic Volumes**

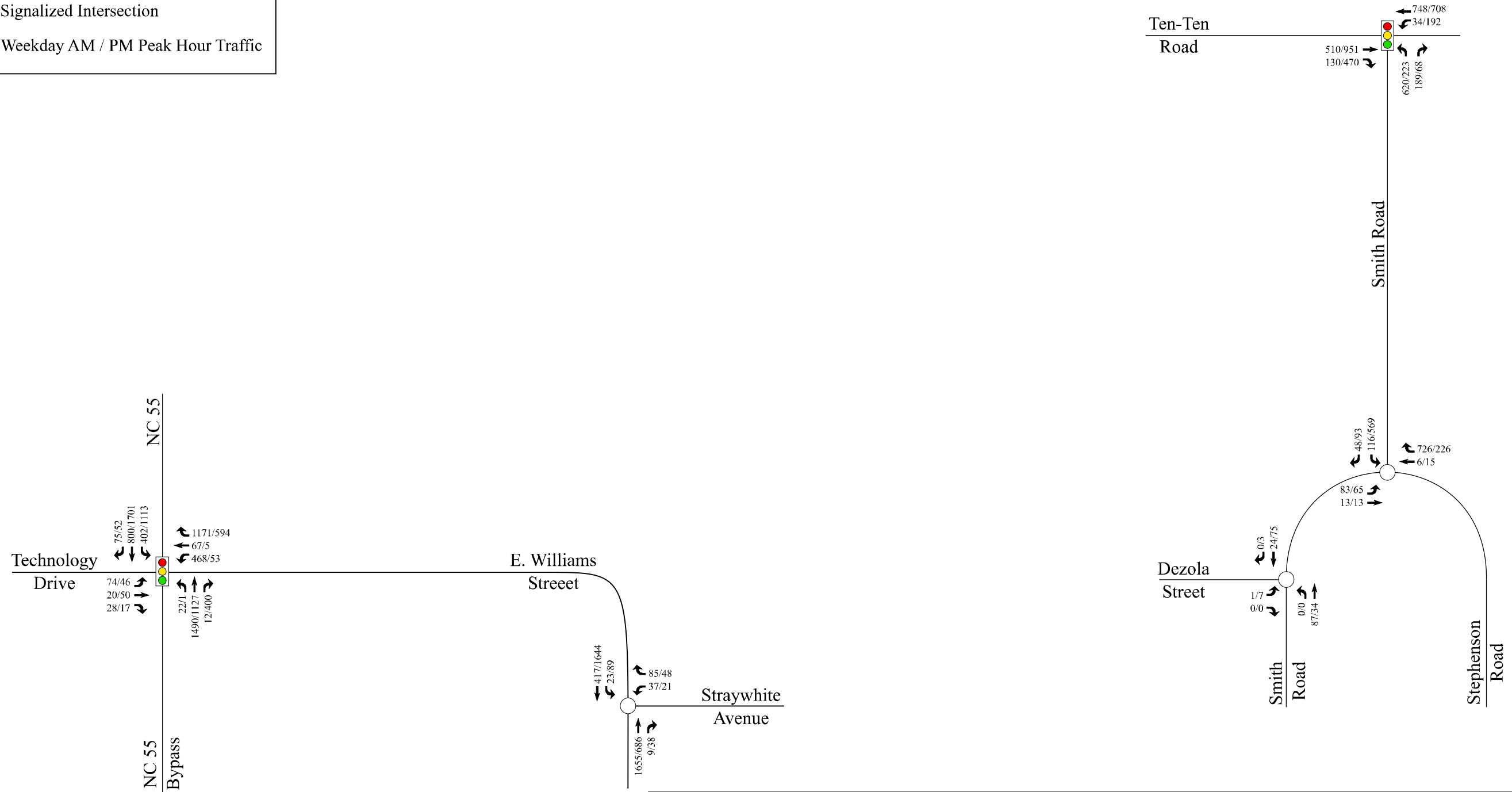
The background (2024/2026) traffic volumes were determined by projecting the existing (2019) peak hour traffic to the year 2024 and 2026, respectively, and adding the adjacent development trips and diverted traffic volumes (for 2026 conditions only). Refer to Figures 8a and 8b for illustrations of the background (2024) and background (2026) peak hour traffic volumes at the study intersections.

### **3.5. Analysis of Background (2024/2026) Peak Hour Traffic Conditions**

The background (2024/2026) AM and PM peak hour traffic volumes at the study intersections were analyzed with future geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.

**LEGEND**

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





Horton Park Update  
Apex, NC

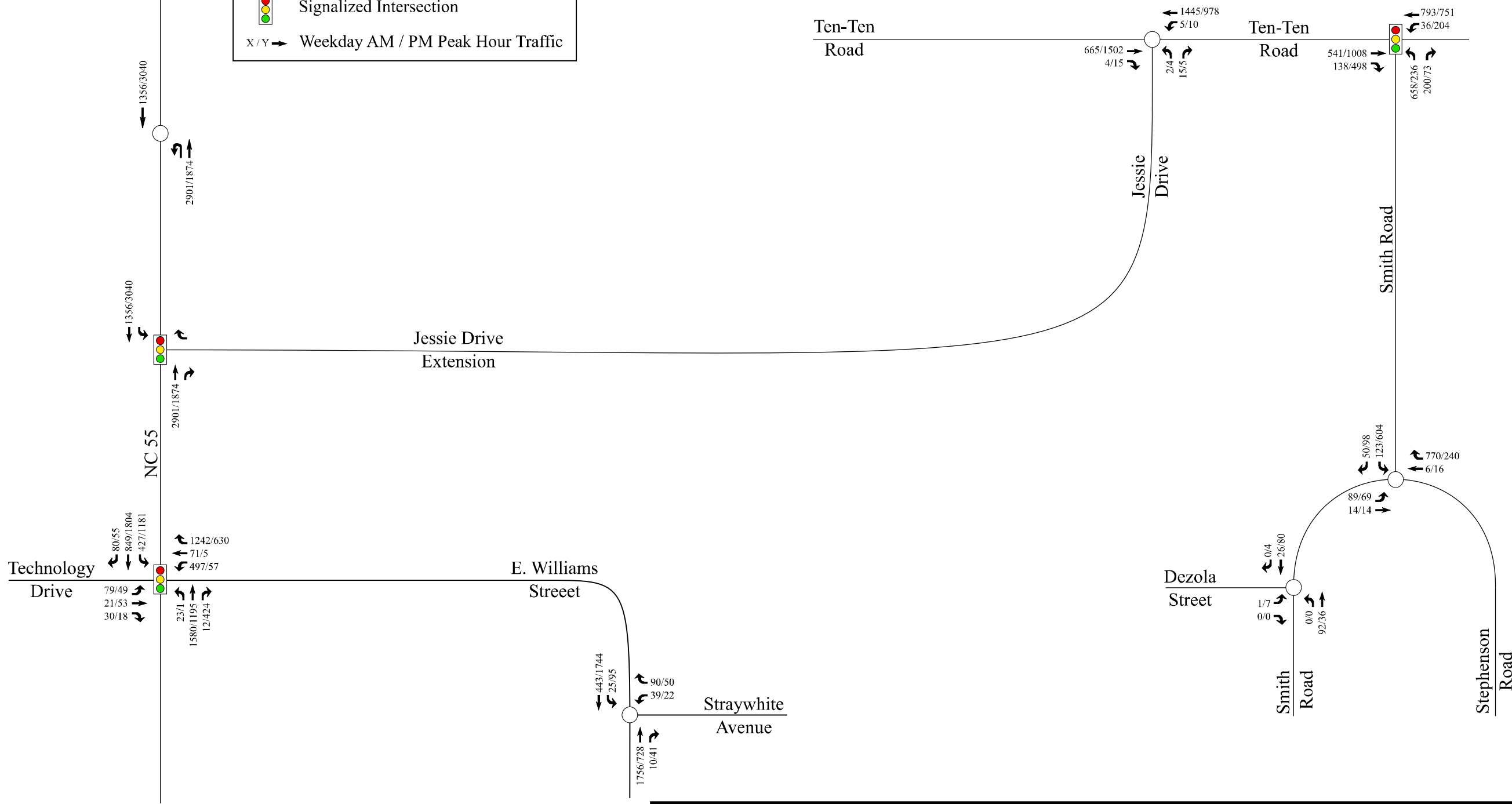
Projected (2024)  
Peak Hour Traffic Volumes


Scale: Not to Scale      Figure 5A



**LEGEND**

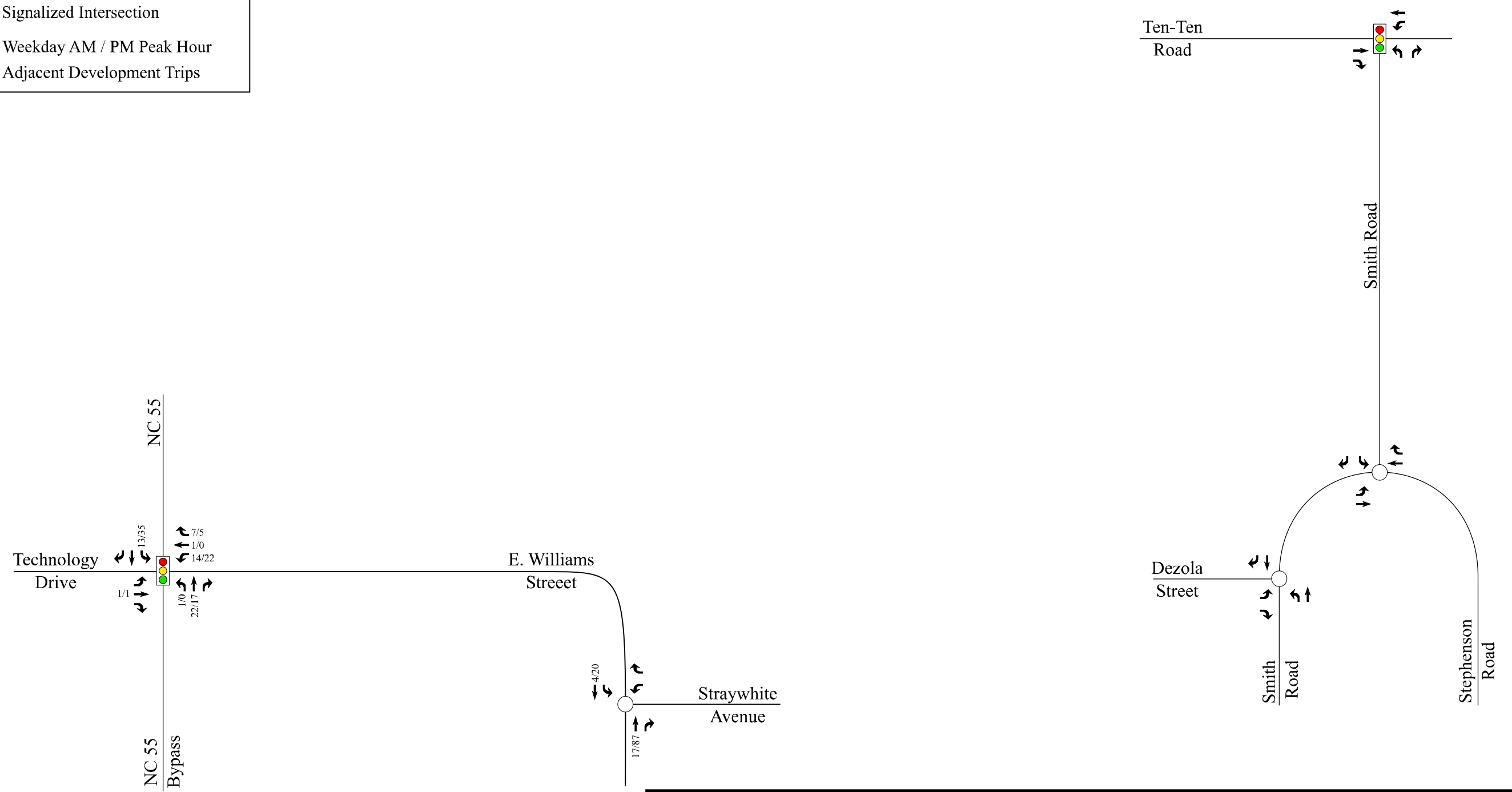
-  Unsignalized Intersection
-  Signalized Intersection
- x/y → Weekday AM / PM Peak Hour Traffic




 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Projected (2026) Peak Hour Traffic Volumes</p>	
		<p>Scale: Not to Scale</p>	<p>Figure 5B</p>

**LEGEND**

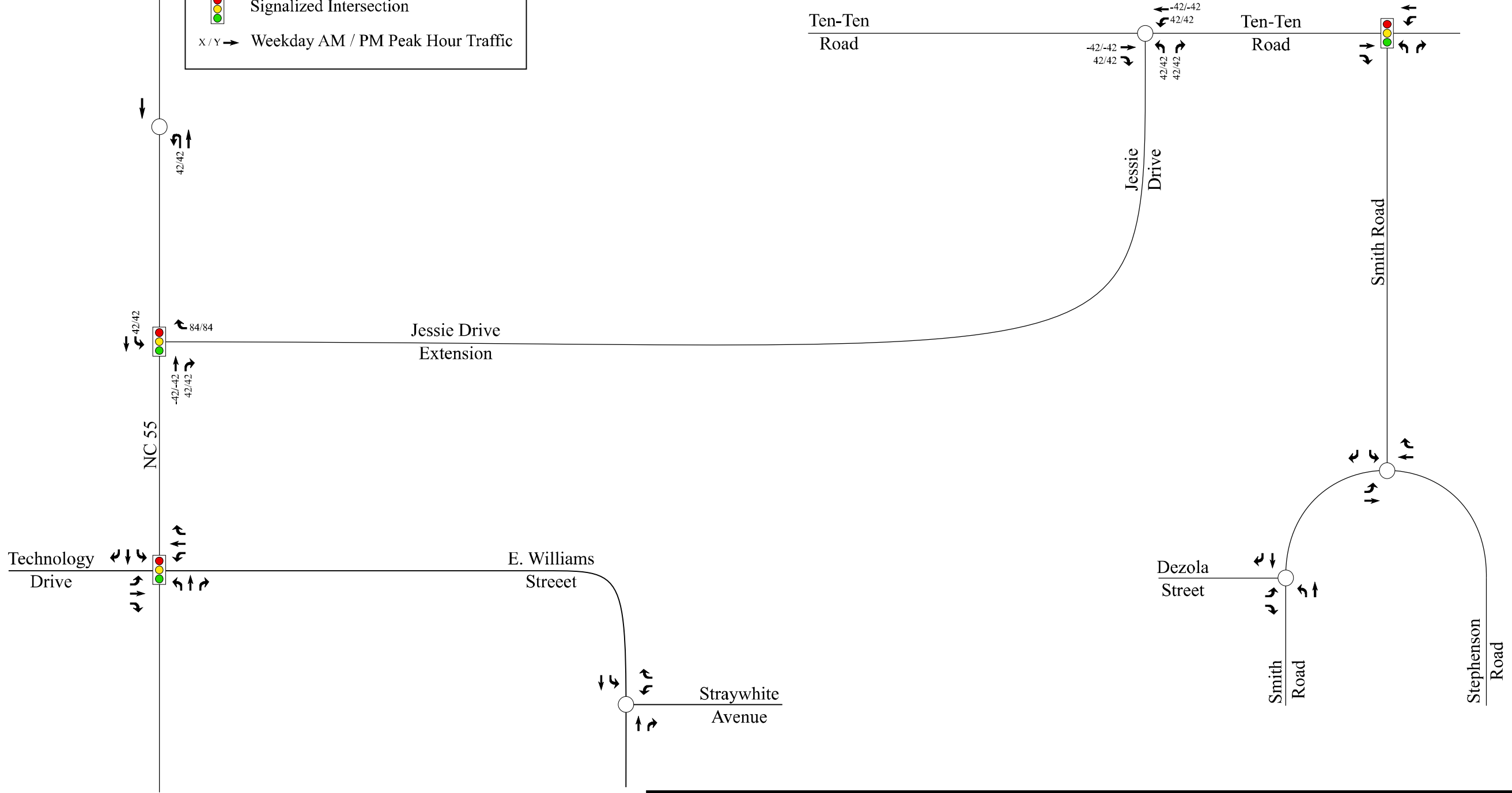
- Unsignalized Intersection
- ◫ Signalized Intersection
- X / Y → Weekday AM / PM Peak Hour Adjacent Development Trips




	Horton Park Update Apex, NC		Peak Hour Adjacent Development Trips	
	Scale: Not to Scale		Figure 6	

**LEGEND**

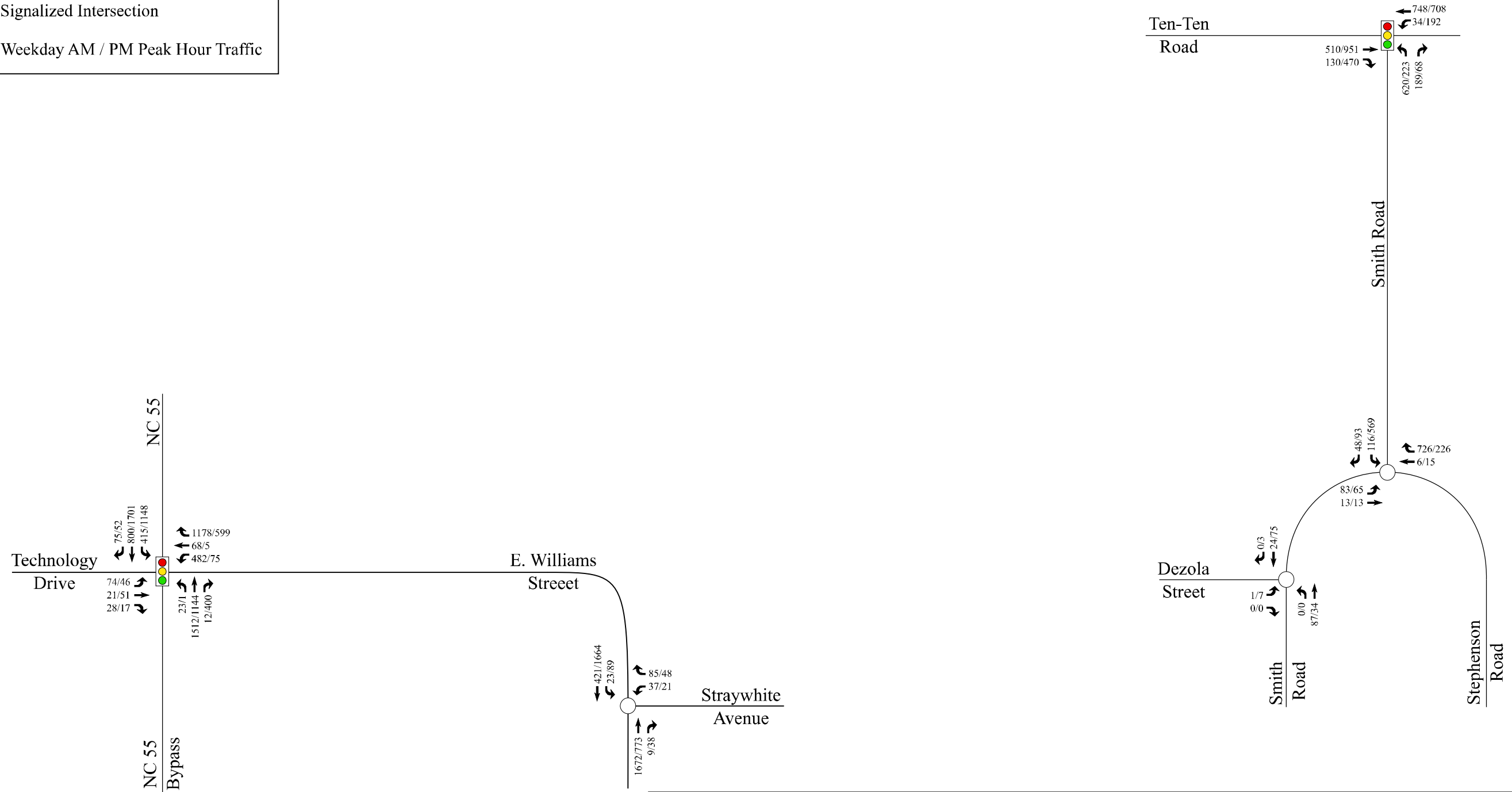
- Unsignalized Intersection
- 🚦 Signalized Intersection
- x / y → Weekday AM / PM Peak Hour Traffic




 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>		<p>Jessie Drive Extension Diverted Traffic - Full Buildout</p>	
	<p>Scale: Not to Scale</p>		<p>Figure 7</p>	



**LEGEND**

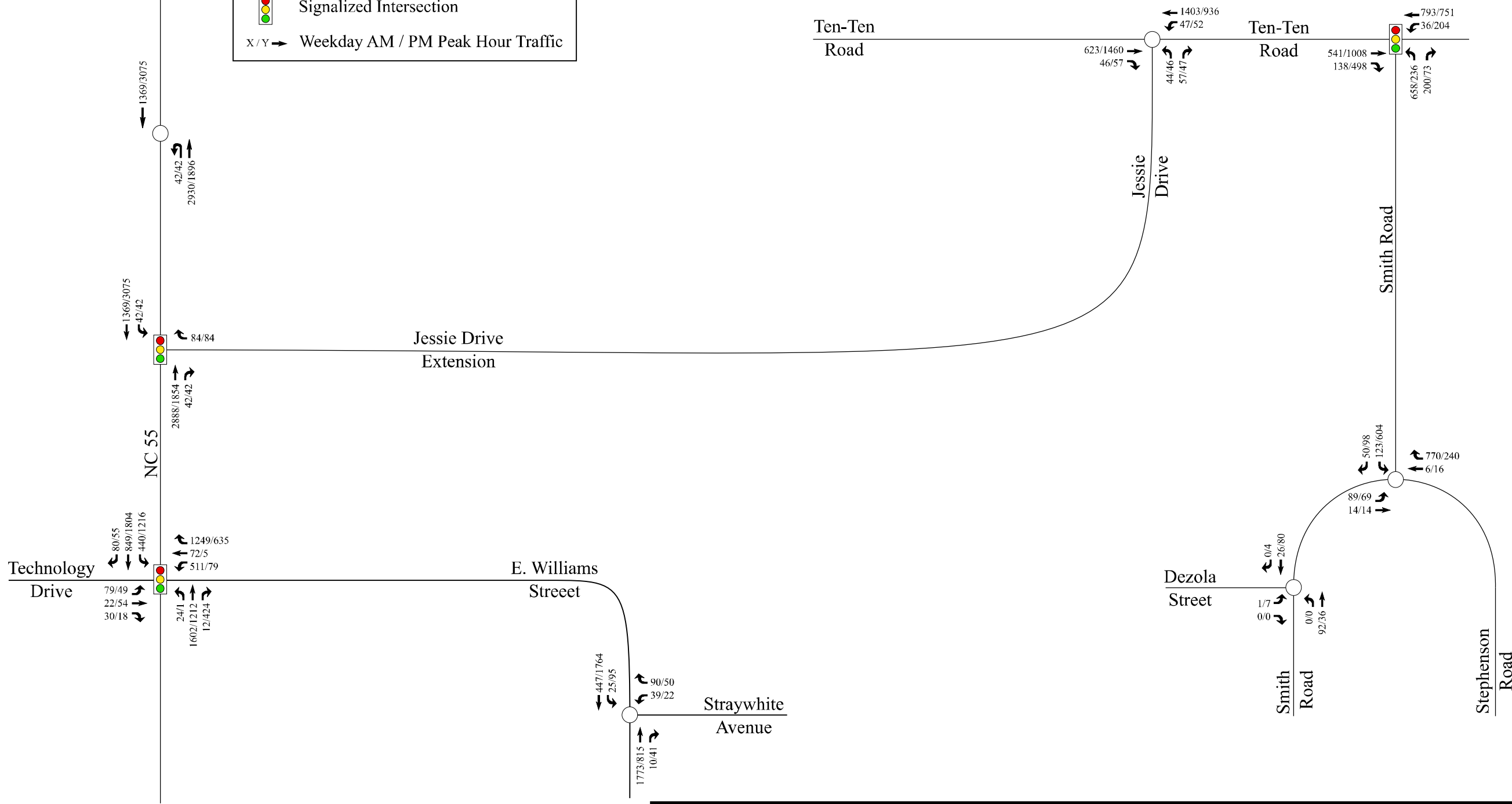
- Unsignalized Intersection
- ◫ Signalized Intersection
- x/y → Weekday AM / PM Peak Hour Traffic




 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Background (2024) Peak Hour Traffic Volumes</p>	
		<p>Scale: Not to Scale</p>	<p>Figure 8A</p>

**LEGEND**

-  Unsignalized Intersection
-  Signalized Intersection
- x/y → Weekday AM / PM Peak Hour Traffic



 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Background (2026) Peak Hour Traffic Volumes</p>
	<p>Scale: Not to Scale</p>	<p>Figure 8B</p>

**4. SITE TRIP GENERATION AND DISTRIBUTION**

**4.1. Trip Generation**

The proposed development is expected to be constructed in two phases. Phase 1 is assumed to consist of approximately 290 single-family homes and 134 townhomes. Full Buildout is assumed to consist of approximately 290 single-family homes, 212 townhomes, 356 apartments, a 40,000 sq. ft. warehouse, and a 40,000 sq. ft. business park. Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 10th Edition. Per the ITE land uses, townhomes and apartments were both analyzed as multifamily housing (low-rise). It should be noted that these land uses have the potential for internal capture between the industrial land uses and residential. In order to present a conservative analysis, this internal capture was not included within the study. Table 2 provides a summary of the trip generation potential for the site under Phase 1 conditions and Table 3 provides a summary of the Full Buildout trip generation potential.

**Table 2: Trip Generation Summary – Phase 1**

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	290 Units	2,770	53	158	178	104
Multifamily Housing (Low-Rise) (220)	134 Units	970	14	49	49	28
<b>Total Trips</b>		<b>3,740</b>	<b>67</b>	<b>207</b>	<b>227</b>	<b>132</b>

It is estimated that Phase 1 of the proposed development will generate approximately 3,740 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 274 trips (67 entering and 207 exiting) will occur during the weekday AM peak hour and 359 (227 entering and 132 exiting) will occur during the weekday PM peak hour.

**Table 3: Trip Generation Summary – Full Buildout**

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	Weekday AM Peak Hour Trips (vph)		Weekday PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Single Family Detached Housing (210)	290 Units	2,770	53	158	178	104
Multifamily Housing (Low-Rise) (220)	568 Units	4,250	57	191	175	102
Warehouse (150)	40,000 s.f.	110	23	7	9	24
Business Park (770)	40,000 s.f.	1,140	49	9	17	48
<b>Total Trips</b>		<b>8,270</b>	<b>182</b>	<b>365</b>	<b>379</b>	<b>278</b>

It is estimated that Full Buildout of the proposed development will generate approximately 8,270 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 547 trips (182 entering and 365 exiting) will occur during the weekday AM peak hour and 657 (379 entering and 278 exiting) will occur during the weekday PM peak hour. It should be noted that this Full Buildout density includes the land uses proposed as part of Phase 1 of the development.

#### 4.2. Site Trip Distribution and Assignment

Trip distribution percentages used in assigning site traffic for this development were estimated based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. The trip distribution has been reviewed and approved by the Town and NCDOT. It is estimated that the Phase 1 and Full Buildout residential trips will be distributed as follows:

- 60% to/from the west via Ten-Ten Road
- 15% to/from the east via Ten-Ten Road
- 5% to/from the south via E. Williams Street
- 10% to/from the south via NC 55 Bypass

- 5% to/from the northwest via NC 55
- 5% to/from the south via Stephenson Road

It is estimated that the industrial trips will be distributed as follows:

- 45% to/from the west via Ten-Ten Road
- 30% to/from the east via Ten-Ten Road
- 5% to/from the south via NC 55 Bypass
- 15% to/from the northwest via NC 55
- 5% to/from the south via Stephenson Road

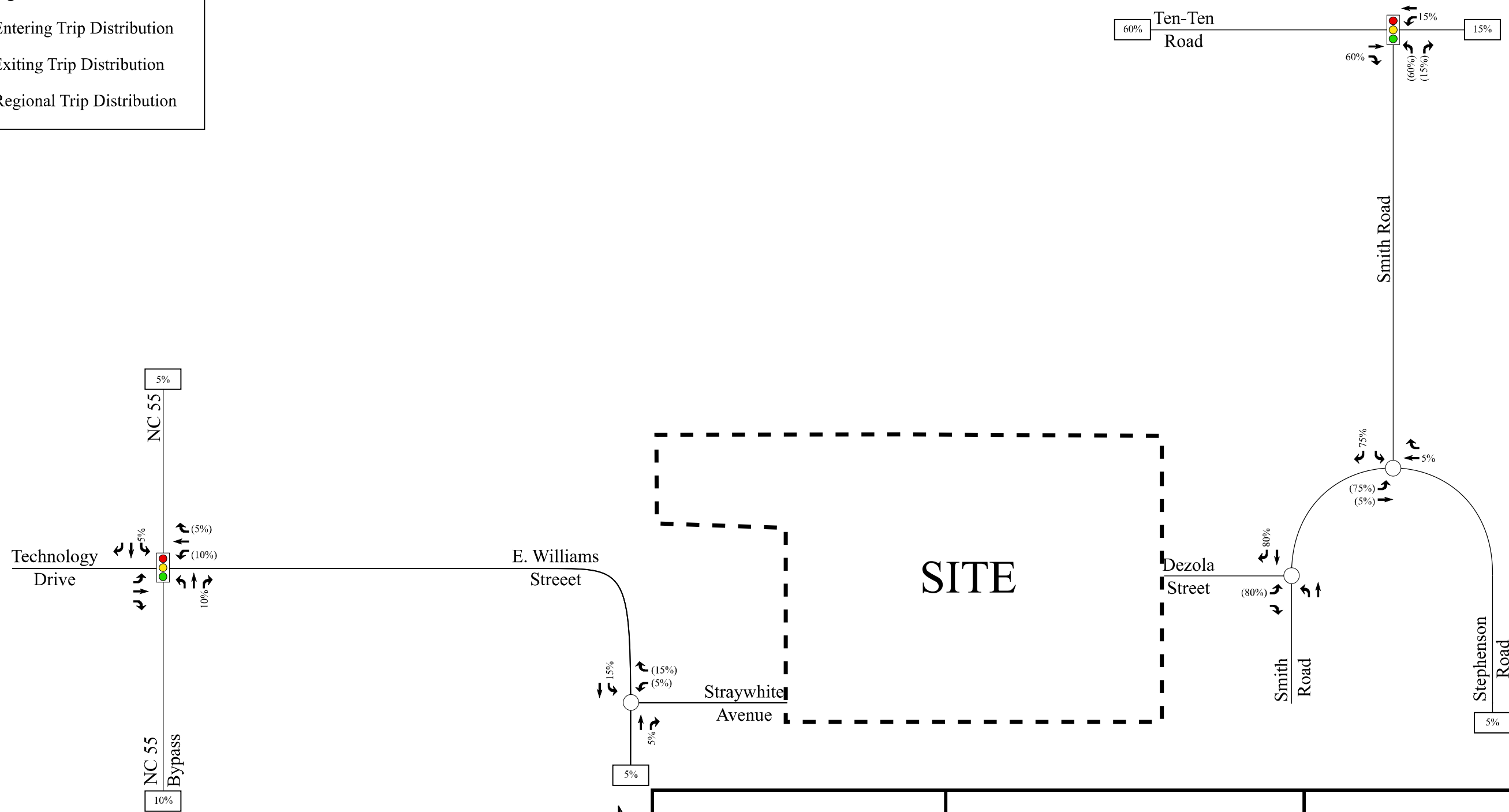
The residential site trip distributions are shown for Phase 1 and Full Buildout in Figures 9A and 9B, respectively. Refer to Figure 10 for the industrial site trip distributions.

Figures 11A and 11B provide the Phase 1 and Full Buildout residential site trip assignments, respectively. Figure 12 provides the Full Buildout industrial site trip assignments. Refer to Figure 13 for the Full Buildout total site trip volumes.



**LEGEND**

- Unsignalized Intersection
- 🚦 Signalized Intersection
- x% → Entering Trip Distribution
- (y%) → Exiting Trip Distribution
- ☐ XX% Regional Trip Distribution



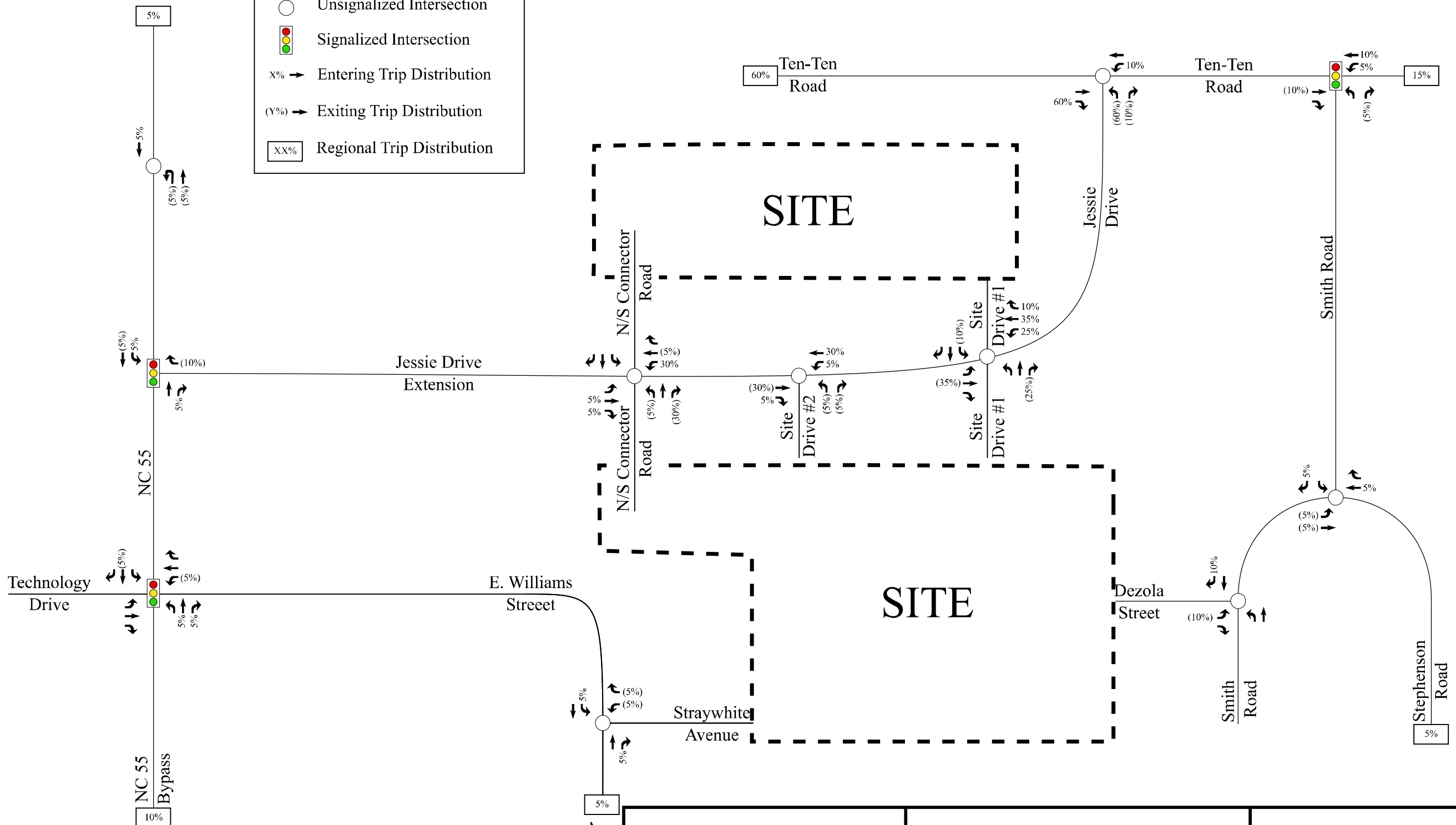
Horton Park Update  
Apex, NC

Residential Site Trip  
Distribution - Phase 1

Scale: Not to Scale      Figure 9A

**LEGEND**

- Unsignalized Intersection
- ◫ Signalized Intersection
- x% → Entering Trip Distribution
- (Y%) → Exiting Trip Distribution
- ◻ XX% Regional Trip Distribution



Horton Park Update  
Apex, NC

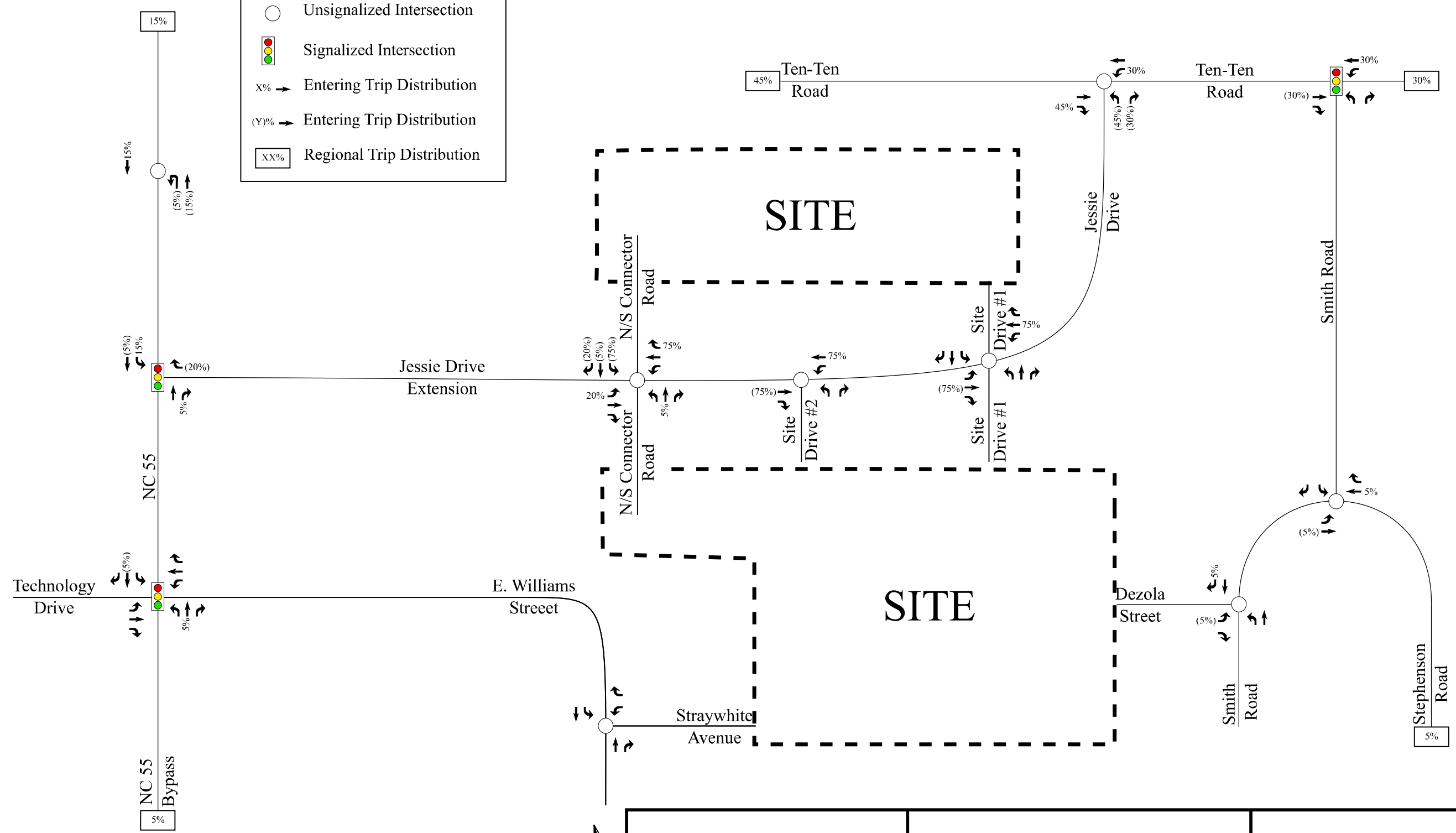
Residential Site Trip Distribution  
- Full Buildout

Scale: Not to Scale

Figure 9B

**LEGEND**

- Unsignalized Intersection
- ⬆️⬆️⬆️ Signalized Intersection
- X% → Entering Trip Distribution
- (Y)% → Entering Trip Distribution
- XX% Regional Trip Distribution



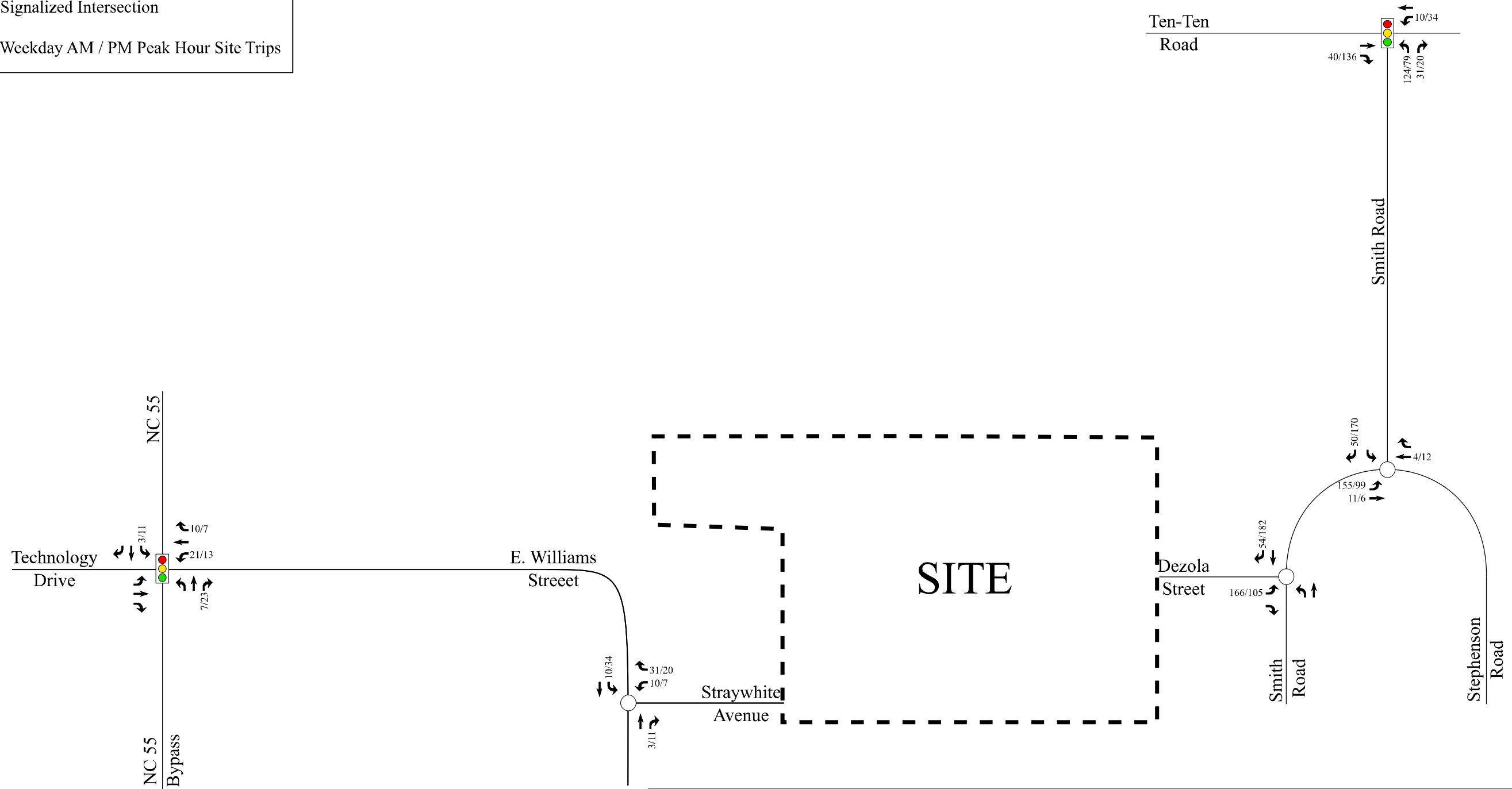
Horton Park Update  
Apex, NC


Industrial Site Trip Distribution  
- Full Buildout

Scale: Not to Scale      Figure 10



**LEGEND**

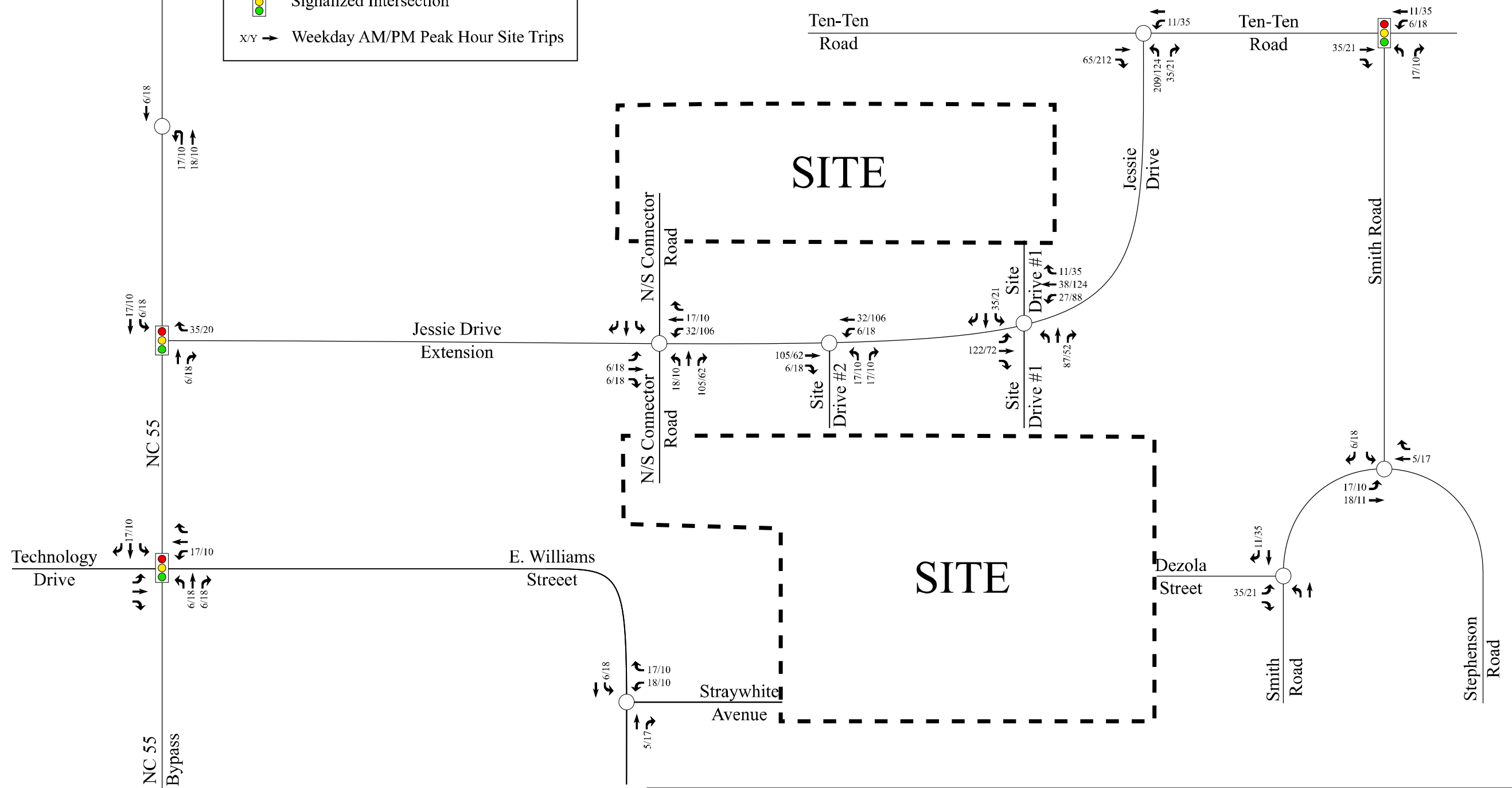
- Unsignalized Intersection
- 🚦 Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Site Trips



	<p>Horton Park Update Apex, NC</p>	<p>Residential Site Trip Assignment - Phase 1</p>
	<p>Scale: Not to Scale</p>	<p>Figure 11A</p>

**LEGEND**

-  Unsignalized Intersection
-  Signalized Intersection
- $xy \rightarrow$  Weekday AM/PM Peak Hour Site Trips



Horton Park Update  
Apex, NC

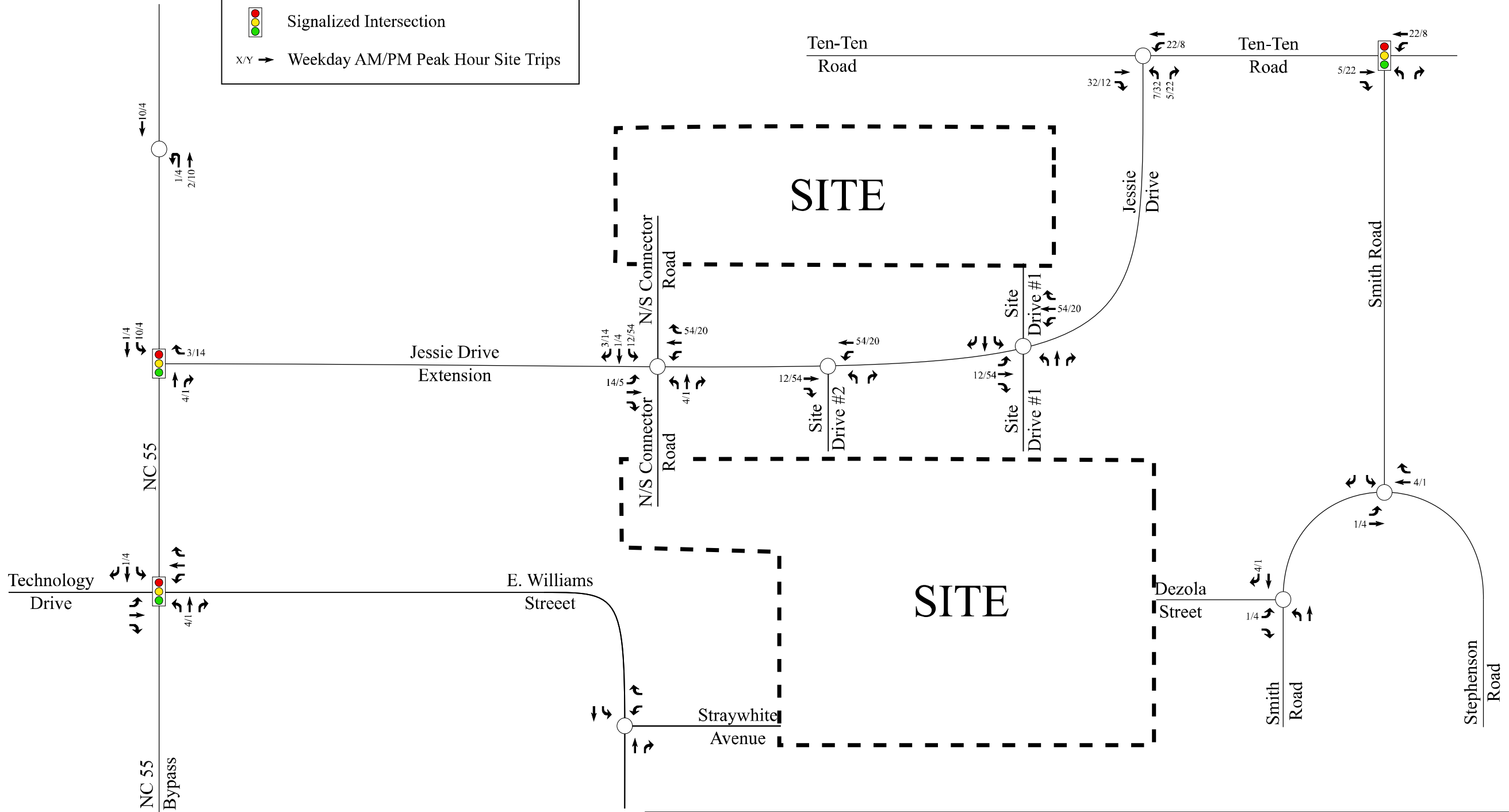
Residential Site Trip Assignment  
- Full Buildout

Scale: Not to Scale

Figure 11B

**LEGEND**

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



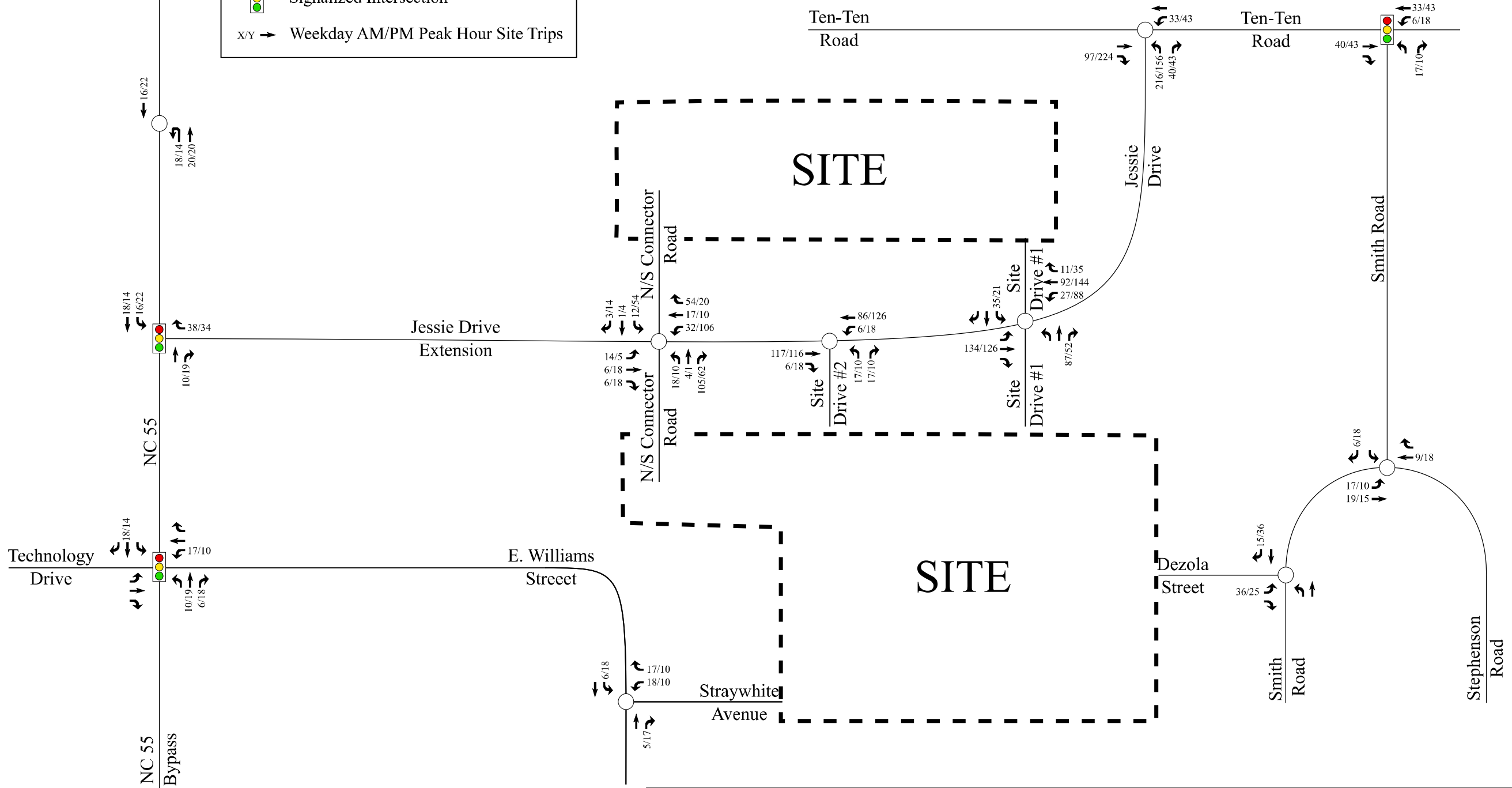
Horton Park Update  
Apex, NC

Industrial Site Trip Assignment - Full Buildout

Scale: Not to Scale      Figure 12

**LEGEND**

- Unsignalized Intersection
- ◫ Signalized Intersection
- x/y → Weekday AM/PM Peak Hour Site Trips



Horton Park Update  
Apex, NC

Total Site Trip Assignment - Full Buildout	
Scale: Not to Scale	Figure 13

**5. COMBINED (2024/2026) TRAFFIC CONDITIONS**

**5.1. Combined (2024/2026) Peak Hour Traffic Volumes**

To estimate traffic conditions with Phase 1 and Full Buildout conditions of the site fully built-out, the total site trips for each scenario were added to the background (2024/2026) traffic volumes to determine the combined (2024) – Phase 1 and combined (2026) – Full Buildout traffic volumes. Refer to Figure 14A for an illustration of the combined (2024) – Phase 1 peak hour traffic volumes and Figure 14B for the combined (2026) - Full Buildout peak hour traffic volumes with the proposed site fully developed.

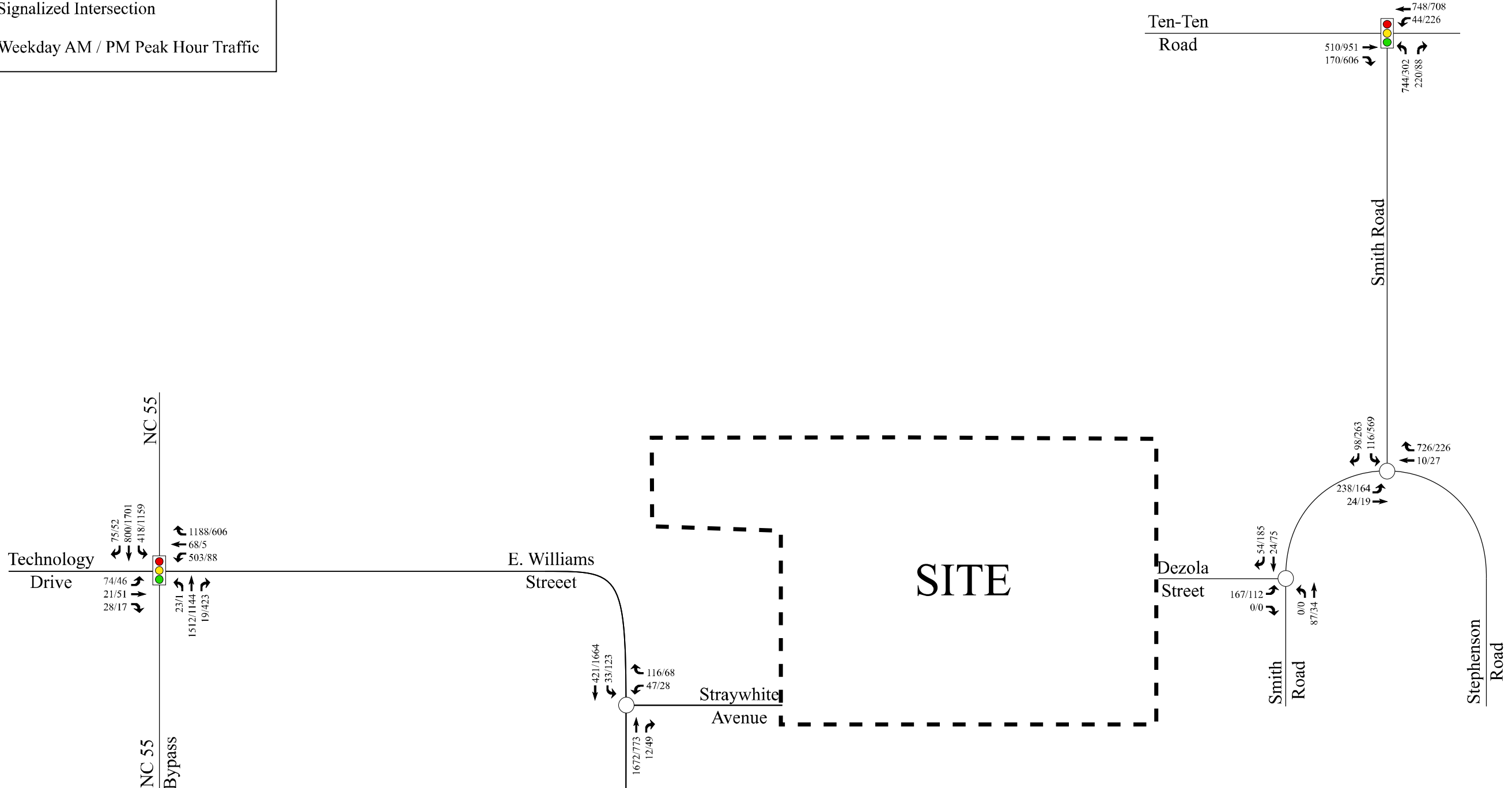
**5.2. Analysis of Combined (2024/2026) Peak Hour Traffic**


Study intersections were analyzed with the combined (2024) – Phase 1 and combined (2026) – Full Buildout traffic volumes using the same methodology previously discussed for existing and background traffic conditions. Intersections were analyzed with improvements necessary to accommodate future traffic volumes. The results of the capacity analysis for each intersection are presented in Section 7 of this report.



**LEGEND**

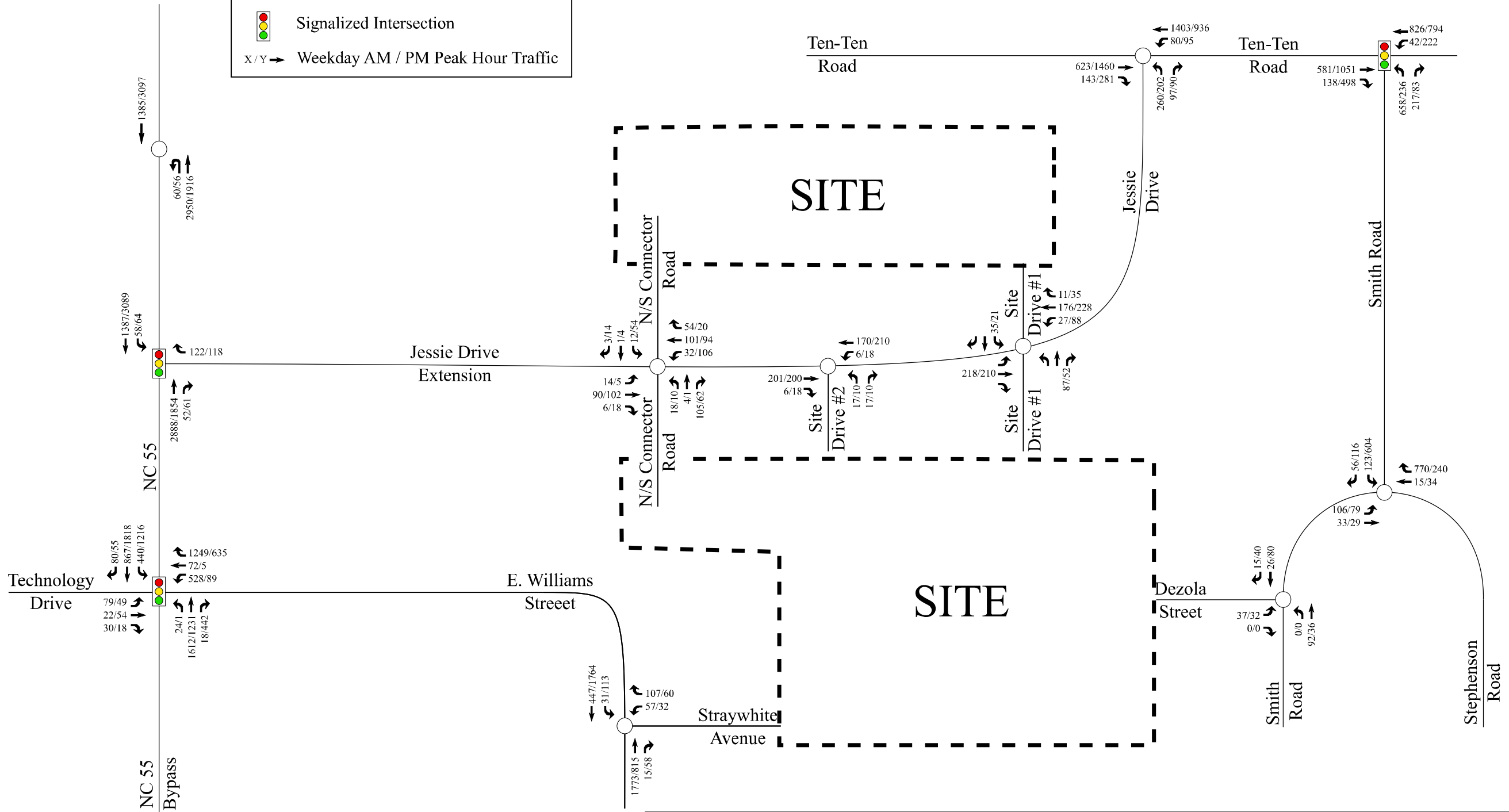
- Unsignalized Intersection
- ◫ Signalized Intersection
- X/Y → Weekday AM / PM Peak Hour Traffic




	<p>Horton Park Update Apex, NC</p>	<p>Combined (2024) Peak Hour Traffic Volumes - Phase 1</p>
	<p>Scale: Not to Scale</p>	<p>Figure 14A</p>

**LEGEND**

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



 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Combined (2026) Peak Hour Traffic Volumes</p>	
		<p>Scale: Not to Scale</p>	<p>Figure 14B</p>

**6. TRAFFIC ANALYSIS PROCEDURE**

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6<sup>th</sup> Edition, published by the Transportation Research Board. Capacity and level of service are the design criteria for this traffic study. A computer software package, Synchro (Version 10.3), was used to complete the analyses for most of the study area intersections. Please note that the unsignalized capacity analysis does not provide an overall level of service for an intersection; only delay for an approach with a conflicting movement.

The HCM defines capacity as “the maximum hourly rate at which persons or vehicles can reasonably be expected to traverse a point or uniform section of a lane or roadway during a given time period under prevailing roadway, traffic, and control conditions.” Level of service (LOS) is a term used to represent different driving conditions, and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers.” Level of service varies from Level “A” representing free flow, to Level “F” where breakdown conditions are evident. Refer to Table 4 for HCM levels of service and related average control delay per vehicle for both signalized and unsignalized intersections. Control delay as defined by the HCM includes “initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay”. An average control delay of 50 seconds at a signalized intersection results in LOS “D” operation at the intersection.

**Table 4: Highway Capacity Manual – Levels-of-Service and Delay**

UNSIGNALIZED INTERSECTION		SIGNALIZED INTERSECTION	
LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)
A	0-10	A	0-10
B	10-15	B	10-20
C	15-25	C	20-35
D	25-35	D	35-55
E	35-50	E	55-80
F	>50	F	>80

### **6.1. Adjustments to Analysis Guidelines**

Capacity analysis at all study intersections was completed according to the NCDOT Congestion Management Guidelines and the Town of Apex UDO, with the exception of the following items:

- The Jessie Drive extension project is currently an unfunded project with the Town currently planning on LAPP funding in 2021 and construction in 2024. As Full Buildout / driveway access points along Jessie Drive are not feasible prior to the Town constructing this roadway, this project was included as a background improvement under Full Buildout conditions. This assumption was approved by the Town and NCDOT during the scoping process. Laneage was assumed per feedback from the Town of Apex staff regarding the anticipated cross-section (two-lane roadway with turn-lanes at Ten-Ten Road and at NC 55) and the desired superstreet configuration at NC 55, which will require a northbound U-turn movement north of the future connection.

**7. CAPACITY ANALYSIS**

**7.1. Ten-Ten Road and Smith Road**

The existing signalized intersection of Ten-Ten Road and Smith Road was analyzed under existing (2019), background (2024), background (2026), combined (2024) - Phase 1, and combined (2026) – Full Buildout traffic conditions with the lane configurations shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

**Table 5: Analysis Summary of Ten-Ten Road and Smith Road**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	EB WB NB	1 TH, 1 RT 1 LT, 1 TH 1 LT, 1 RT	C B E	D (35)	C B D	C (22)
Background (2024) Conditions	EB WB NB	<u>1 UT, 2 TH, 1 RT</u> 1 LT, <u>2 TH</u> <u>2 LT</u> , 1 RT	B B C	B (16)	B B C	B (16)
Background (2026) Conditions	EB WB NB	<u>1 UT, 2 TH, 1 RT</u> 1 LT, <u>2 TH</u> <u>2 LT</u> , 1 RT	B B C	B (17)	B B C	B (16)
Combined (2024) Conditions – Phase 1	EB WB NB	<u>1 UT, 2 TH, 1 RT</u> 1 LT, <u>2 TH</u> <u>2 LT</u> , 1 RT	B B C	B (18)	B B C	B (18)
Combined (2026) Conditions – Full Buildout	EB WB NB	<u>1 UT, 2 TH, 1 RT</u> 1 LT, <u>2 TH</u> <u>2 LT</u> , 1 RT	B B C	B (17)	B B C	B (17)

Expected TIP Improvements are underlined.

Capacity analysis of existing (2019) conditions indicate that the intersection of Ten-Ten Road and Smith Road currently operates at an overall LOS D or better during the weekday AM and PM peak hours. Under all background and combined analysis conditions, the intersection is expected to operate at LOS B, with all approaches operating at LOS C or better during the weekday AM and PM peak hours. This improvement in operations is expected due to the NCDOT U-5825B project to widen Ten-Ten Road to a four-lane median divided roadway. The proposed development is expected to have a larger impact at this intersection under Phase 1

conditions with the operations improving under Full Buildout due to the additional site accesses that will be opened up to Jessie Drive and the Jessie Drive Extension. These additional accesses are expected to reduce the number of site trips that will use this intersection. It should also be noted that the NCDOT TIP improvements (U-5825B) were modeled according to the most current conceptual drawings available. These plans are expected to change slightly throughout the design process. Additionally, signal phasing was assumed according to NCDOT Congestion Management standards for analysis of new intersections with protected only phasing. Protected/permitted phasing, or Dallas protected/permitted phasing may be possible and will be determined during design of the TIP project. These signal phasing's, if possible, will likely present improvements to the signal operations over the protected only phasing that was analyzed.

**7.2. NC 55 / NC 55 Bypass and Technology Drive / E. Williams Street**

The existing signalized intersection of NC 55 / NC 55 Bypass and Technology Drive / E. Williams Street was analyzed under existing (2019), background (2024), background (2026), combined (2024) - Phase 1, and combined (2026) – Full Buildout traffic conditions with the lane configurations shown in Table 6. Refer to Table 6 for a summary of the analysis results. Refer to Appendix F for the Synchro capacity analysis reports.

**Table 6: Analysis Summary of NC 55 / NC 55 Bypass and Technology Drive / E. Williams Street**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	D F C C	E (62)	D A C C	C (23)
Background (2024) Conditions	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	E F C C	F (108)	E A C F	E (57)
Background (2026) Conditions	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	E F C C	F (129)	E A C F	E (72)
Combined (2024) Conditions – Phase 1	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	E F C C	F (117)	E B C F	E (61)
Combined (2024) Conditions – Phase 1 – <b>with Signal Timing Modifications</b>	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	D E E E	E (62)	E B E C	D (37)
Combined (2026) Conditions – Full Buildout	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	E F C C	F (137)	E B C F	E (76)
Combined (2026) Conditions – Full Buildout – <b>with Signal Timing Modifications</b>	EB WB NB SB	1 LT, 1 TH, 1 RT 1 LT, 1 TH, 1 RT 1 LT, 2 TH, 1 RT 2 LT, 2 TH, 1 RT	C E F E	E (77)	F B E C	D (41)

Capacity analysis of existing (2019) conditions indicate the intersection of E. Williams Street / Technology Drive and NC 55 / NC 55 Bypass operates at an overall LOS E during the weekday AM peak hour and LOS C during the weekday PM peak hour. Under background (2024), background (2026), combined (2024) – Phase 1, and combined (2026) – Full Buildout conditions the intersection is expected to operate to an overall LOS F during the weekday AM peak hour and LOS E during the weekday PM peak hour. Under Phase 1 conditions, the proposed development is expected to increase the overall intersection delay by 9 seconds during the weekday AM peak hour and 4 seconds during the weekday PM peak hour.

Under Full Buildout conditions, the proposed development is expected to increase the overall intersection delay by 8 seconds during the weekday AM peak hour and 4 seconds during the weekday PM peak hour. The proposed development is expected to have a larger impact at this intersection under Phase 1 conditions with the operations improving under full buildout due to the additional site accesses that will be opened up to Jessie Drive and the Jessie Drive Extension. These additional accesses are expected to reduce the number of site trips that will use this intersection. Per the Town UDO, if background conditions are expected to operate at an overall LOS E or worse the development must improve the intersection if the development's traffic is greater than or equal to 10% of the weekday AM or PM peak hour traffic when compared to the background traffic conditions. It should be noted that the development is expected to add approximately 1% of traffic to the intersection during the weekday AM and PM peak hours in Phase 1 and Full Buildout conditions.

Despite the minor impact at the subject intersection, signal timing improvements were considered to improve the intersection to an overall LOS E or better under all analysis conditions. These improvements will likely be implemented periodically by NCDOT and are therefore not recommended for the subject development.



### 7.3. Smith Road and Stephenson Road

The existing unsignalized intersection of Smith Road and Stephenson Road was analyzed under existing (2019), background (2024), background (2026), combined (2024) - Phase 1, and combined (2026) – Full Buildout traffic conditions with the lane configurations and traffic control shown in Table 7. Refer to Table 7 for a summary of the analysis results. Refer to Appendix G for the Synchro capacity analysis reports.

**Table 7: Analysis Summary of Smith Road and Stephenson Road**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	EB WB SB	1 LT-TH 1 TH-RT 1 LT, 1 RT	A <sup>1</sup> -- B <sup>2</sup>	N/A	A <sup>1</sup> -- C <sup>2</sup>	N/A
Background (2024) Conditions	EB WB SB	1 LT-TH 1 TH-RT <u>1 LT, 1 RT</u>	A <sup>1</sup> -- C <sup>2</sup>	N/A	A <sup>1</sup> -- E <sup>2</sup>	N/A
Background (2026) Conditions	EB WB SB	1 LT-TH 1 TH-RT <u>1 LT, 1 RT</u>	B <sup>1</sup> -- C <sup>2</sup>	N/A	A <sup>1</sup> -- F <sup>2</sup>	N/A
Combined (2024) Conditions – Phase 1	EB WB SB	1 LT-TH 1 TH-RT <u>1 LT, 1 RT</u>	B <sup>1</sup> -- E <sup>2</sup>	N/A	A <sup>1</sup> -- F <sup>2</sup>	N/A
Combined (2024) Conditions – Phase 1- <b>with Improvements</b>	EB WB SB	<b>1 LT, 1 TH</b> 1 TH-RT <u>1 LT, 1 RT</u>	B <sup>1</sup> -- E <sup>2</sup>	N/A	A <sup>1</sup> -- F <sup>2</sup>	N/A
Combined (2026) Conditions – Full Buildout	EB WB SB	1 LT-TH 1 TH-RT <u>1 LT, 1 RT</u>	B <sup>1</sup> -- C <sup>2</sup>	N/A	A <sup>1</sup> -- F <sup>2</sup>	N/A
Combined (2026) Conditions – Full Buildout - <b>with Improvements</b>	EB WB SB	<b>1 LT, 1 TH</b> 1 TH-RT <u>1 LT, 1 RT</u>	B <sup>1</sup> -- C <sup>2</sup>	N/A	A <sup>1</sup> -- F <sup>2</sup>	N/A

1. Level of service for major-street left-turn movement.  
 2. Level of service for minor-street approach.  
 Improvements by Developer in **Bold**.  
 Expected TIP Improvements are underlined.

Capacity analysis of existing (2019) conditions indicates the major-street left-turn movement and minor-street approaches operate at LOS C or better during the weekday AM and PM peak

hour. Under background (2026), combined (2024) – Scenario 1, and combined (2026) – Full Buildout conditions the minor-street approach is expected to operate at LOS F during the weekday PM peak hour. Although not necessary from a level-of-service perspective, an eastbound left-turn lane is recommended to accommodate the additional eastbound traffic at the intersection. NCDOT’s U-5825B Ten-Ten Road widening project is expected to widen Smith Road to a three-lane section from Ten-Ten Road to Stephenson Road. These improvements are not expected to affect the capacity at the intersection of Stephenson Road and Smith Road but are included in all future year analyses.

It should be noted that a signal was considered according to the methodology contained within the *Manual on Uniform Traffic Control Devices* (MUTCD) and the intersection is expected to only meet the weekday PM peak hour warrants for a signal under combined (2023) – Scenario 1 and combined (2023) – Scenario 2 conditions. Due to the residential nature of this area, it is not expected that the intersection would meet the 4 or 8-hour warrants for a signal, which the NCDOT typically require. Based on the short duration of heavy traffic expected at this intersection, signalization is not recommended as part of this study.

**7.4. Smith Road and Dezola Street**

The existing unsignalized intersection of Smith Road and Dezola Street was analyzed under existing (2019), background (2024), background (2026), combined (2024) - Phase 1, and combined (2026) – Full Buildout traffic conditions with the lane configurations and traffic control shown in Table 8. Refer to Table 8 for a summary of the analysis results. Refer to Appendix H for the Synchro capacity analysis reports.

**Table 8: Analysis Summary of Smith Road and Dezola Street**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A
Background (2024) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A
Background (2026) Conditions	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A
Combined (2024) Conditions – Phase 1	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	B <sup>2</sup> A <sup>1</sup> --	N/A	B <sup>2</sup> A <sup>1</sup> --	N/A
Combined (2024) Conditions – Phase 1 – <b>with Improvements</b>	EB NB SB	1 LT-RT 1 LT-TH <b>1 TH, 1 RT</b>	B <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A
Combined (2026) Conditions – Full Buildout	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A
Combined (2026) Conditions – Full Buildout – <b>with Improvements</b>	EB NB SB	1 LT-RT 1 LT-TH <b>1 TH, 1 RT</b>	A <sup>2</sup> A <sup>1</sup> --	N/A	A <sup>2</sup> A <sup>1</sup> --	N/A

1. Level of service for major-street left-turn movement.  
 2. Level of service for minor-street approach.  
 Improvements by Developer in **Bold**.

Capacity analysis of all analysis conditions indicates that the minor-street approach and major-street left-turn movement at the intersection of Smith Road and Dezola Street are expected to

operate at LOS B or better during both weekday AM and PM peak hours. Although not necessary to meet the level-of-service requirements, a southbound right-turn lane is recommended to accommodate the additional site traffic at the intersection. This turn-lane was recommended based on the NCDOT Driveway Manual *Warrant for left and Right-Turn Lanes* chart.

**7.5. E. Williams Street and Straywhite Avenue**

The existing unsignalized intersection of E. Williams Street and Straywhite Avenue was analyzed existing (2019), background (2024), background (2026), combined (2024) - Phase 1, and combined (2026) – Full Buildout traffic conditions with the lane configurations and traffic control shown in Table 9. Refer to Table 9 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports.

**Table 9: Analysis Summary of E. Williams Street and Straywhite Avenue**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- B <sup>1</sup>	N/A	C <sup>2</sup> -- A <sup>1</sup>	N/A
Background (2024) Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	C <sup>2</sup> -- B <sup>1</sup>	N/A
Background (2026) Conditions	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	D <sup>2</sup> -- B <sup>1</sup>	N/A
Combined (2024) Conditions – Phase 1	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	D <sup>2</sup> -- B <sup>1</sup>	N/A
Combined (2024) Conditions – Phase 1 – <b>with Improvements</b>	WB NB SB	1 LT, <b>1 RT</b> 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	C <sup>2</sup> -- B <sup>1</sup>	N/A
Combined (2026) Conditions – Full Buildout	WB NB SB	1 LT-RT 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	D <sup>2</sup> -- B <sup>1</sup>	N/A
Combined (2026) Conditions – Full Buildout – <b>with Improvements</b>	WB NB SB	1 LT, <b>1 RT</b> 1 TH, 1 RT 1 LT, 1 TH	F <sup>2</sup> -- C <sup>1</sup>	N/A	D <sup>2</sup> -- B <sup>1</sup>	N/A

1. Level of service for major-street left-turn movement.
  2. Level of service for minor-street approach.
- Improvements by Developer in **Bold**.

Capacity analysis of all analysis conditions indicates the minor-street approach at the intersection of E. Williams Street and Straywhite Avenue is expected to operate at LOS F

during the weekday AM peak hour. During the weekday PM peak hour, the minor-street approach is expected to operate at LOS D or better under all analysis conditions. The major-street left-turn movement is expected to operate at LOS C or better during the weekday AM and PM peak hours under all analysis conditions.

Although it is not uncommon to experience significant delay for a minor-street approach during the peak hour with a high volume of through traffic on the mainline, a signal was considered according to methodology contained in the MUTCD. The intersection is expected to only meet peak hour warrants for signalization during the weekday AM peak hour under Phase 1 and Full Buildout conditions. Due to the residential nature of this area, it is not expected that the intersection would meet the 4 or 8-hour warrants for a signal, which the NCDOT typically require. Due to this, signalization of this intersection is not recommended by the subject development. Additionally, the intersection of E. Williams Street / Technology Drive and NC 55 / NC 55 Bypass is located approximately 1,400 feet north of this intersection. Per SimTraffic simulations of the weekday AM peak hour under existing (2019) conditions, the westbound approach at this upstream signal (E. Williams Street), queues beyond the Straywhite Avenue intersection. Due to this, signalization would likely not be desirable to NCDOT. Traffic exiting Straywhite Avenue during the weekday AM peak hour would likely be given courtesy gaps by motorists on E. Williams Street, allowing for egress with significantly less delay than modeled by Synchro.

The subject development is expected to account for approximately 2% of the traffic at this intersection during the weekday AM peak hour and 3% during the weekday PM peak hour under combined (2024) – Phase 1 conditions. Due to the additional site access provided to Jessie Drive under Full Buildout conditions, Phase 1 conditions are expected to reduce the number of site trips added to this intersection by the proposed Horton Park development.

The westbound approach of Straywhite Avenue at E. Williams Street is approximately 21 feet in width. Due to this available pavement, it is recommended that Straywhite Avenue be restriped to provide an exclusive left and right-turn lane at E. Williams Street.

**7.6. Ten-Ten Road and Jessie Drive**

The existing unsignalized intersection of Ten-Ten Road and Jessie Drive was analyzed under existing (2019), background (2026), and combined (2026) – Full Buildout traffic conditions with the lane configurations shown in Table 10. Refer to Table 10 for a summary of the analysis results. Refer to Appendix J for the Synchro capacity analysis reports.

**Table 10: Analysis Summary of Ten-Ten Road and Jessie Drive**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Existing (2019) Conditions	EB WB NB	1 TH-RT 1 LT-TH 1 LT-RT	-- A <sup>1</sup> C <sup>2</sup>	N/A	-- B <sup>1</sup> F <sup>2</sup>	N/A
Background (2026) Conditions	EB WB NB	<u>3 TH, 1 RT</u> <u>1 LT, 2 TH</u> 1 LT, 1 RT	-- B <sup>1</sup> D <sup>2</sup>	N/A	-- D <sup>1</sup> F <sup>2</sup>	N/A
Combined (2026) Conditions – Full Buildout	EB WB NB	<u>3 TH, 1 RT</u> <u>1 LT, 2 TH</u> 1 LT, 1 RT	-- B <sup>1</sup> F <sup>2</sup>	N/A	-- F <sup>1</sup> F <sup>2</sup>	N/A
Combined (2026) Conditions – Full Buildout – <b>with Signalization</b>	EB WB NB	<u>3 TH, 1 RT</u> <u>1 LT, 2 TH</u> 1 LT, 1 RT	B B C	<b>B (18)</b>	B B C	<b>B (18)</b>

1. Level of service for major-street left-turn movement.  
 2. Level of service for minor-street approach.  
 Improvements by Developer in **Bold**.  
 Expected TIP Improvements are underlined.  
 Expected Town Improvements are in **red**. (Potential LAPP project)

Capacity analysis of existing (2019) and background (2026) conditions indicates that the major-street left-turn movement is expected to operate at LOS D or better during the weekday AM and PM peak hour. The minor-street approach is expected to operate at LOS D or better during the weekday AM peak hour and LOS F during the weekday PM peak hour under existing (2019) and background (2026) conditions. Under combined (2026) – Full Buildout conditions the minor-street approach is expected to degrade to LOS F during the weekday AM peak hour and the major-street left-turn movement is expected to degrade to LOS F during the weekday PM peak hour. Due to the poor level of service expected under combined (2026) –

Full Buildout conditions, a signal was considered according to the methodology contained within the *Manual on Uniform Traffic Control Devices* (MUTCD). The intersection is expected to meet the weekday AM and PM peak hour warrants for a signal under combined (2026) – Full Build conditions. Ten-Ten Road is expected to undergo widening as part of the U-5825B project, prior to full buildout of the proposed development. These improvements are not full designed; therefore, laneage was included in this study according to the most recent conceptual design available. Additional improvements are expected with the Town’s LAPP funded project to extend Jessie Drive to NC 55. Per coordination with the Town, this project is expected to provide a two-lane roadway with turn-lanes at NC 55 and at Ten-Ten Road. At the time of this TIA, signalization of this intersection is not currently planned as part of the NCDOT or Town projects. With signalization in place, the intersection is expected to operate at an overall LOS C or better under combined (2026) – Full Buildout conditions. Due to the operational benefits of the signal, it is recommended that the intersection be monitored for signalization by proposed development after buildout of the Jessie Drive site access.



**7.7. Jessie Drive Extension and NC 55**

The proposed signalized intersection of Jessie Drive and NC 55 was analyzed under background (2026) and combined (2026) – Full Buildout traffic conditions with proposed lane configurations and traffic control. Refer to Table 11 for a summary of the analysis results. Refer to Appendix K for the Synchro capacity analysis reports.

**Table 11: Analysis Summary of Jessie Drive Extension and NC 55**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Background (2026) Conditions	WB NB SB	1 RT 2 TH, 1 RT 1 LT, 2 TH	E F D*	D (47)	B B B*	B (15)
Combined (2026) Conditions – Full Buildout	WB NB SB	1 RT 2 TH, 1 RT 1 LT, 2 TH	E F D*	D (53)	B B C*	C (21)

\*Due to the limited capabilities of Synchro, the southbound left-turn movement was analyzed as an eastbound through movement.  
Expected Town Improvements are in red.

Capacity analysis of background (2026) and combined (2026) – Full Buildout traffic conditions indicate the intersection of Jessie Drive Extension and NC 55 is expected to operate at an overall LOS D or better during the weekday AM and PM peak hours. This intersection is expected to be constructed by the Town of Apex via a LAPP funded project to construct the Jessie Drive extension in 2024. As this project is not currently designed, the location, laneage, and superstreet configuration were determined through coordination with Town staff. Jessie Drive Extension is expected to provide a two-lane roadway with turn-lanes at NC 55 and at Ten-Ten Road. Full buildout of the proposed development is expected to account for approximately 6 seconds of additional delay during the weekday AM peak hour and 6 seconds of additional delay during the weekday PM peak hour.

**7.8. Northbound U-Turn and NC 55**

The proposed unsignalized intersection of Northbound U-Turn and NC 55 was analyzed under background (2026) and combined (2026) – Full Buildout traffic conditions with proposed lane configurations and traffic control. Refer to Table 12 for a summary of the analysis results. Refer to Appendix L for the Synchro capacity analysis reports.

**Table 12: Analysis Summary of Northbound U-Turn and NC 55**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Background (2026) Conditions	NB SB	1 UT, 2 TH 2 TH	C* <sup>1</sup> --	N/A	F* <sup>1</sup> --	N/A
Combined (2026) Conditions – Full Buildout	NB SB	1 UT, 2 TH 2 TH	C* <sup>1</sup> --	N/A	F* <sup>1</sup> --	N/A

\*Due to the limited capabilities of Synchro, the northbound U-turn was analyzed as a westbound left-turn.

1. Level of service for major-street U-turn movement.

Expected Town Improvements are in red.

Capacity analysis of background (2026) and combined (2026) – Full Buildout traffic conditions indicate the unsignalized Northbound U-turn movement, north of the proposed Jessie Drive Extension, is expected to operate at LOS C during the weekday AM peak hour and LOS F during the weekday PM peak hour. A signal was considered according to the methodology contained within the *Manual on Uniform Traffic Control Devices (MUTCD)* and the intersection is not expected to meet the weekday AM or PM peak hour warrants for a signal under combined (2026) – Full Buildout conditions. Additionally, due to the upstream signals, sufficient gaps in traffic are expected to allow for U-turn maneuvers during times of heavy traffic (weekday PM peak hour). This intersection is expected to be constructed by the Town of Apex via a LAPP funded project to construct the Jessie Drive extension in 2024. As this project is not currently designed, the location, and laneage for this intersection was assumed based on coordination with Town staff.

**7.9. Jessie Drive and North-South Connector**

The proposed unsignalized intersection of Jessie Drive and North-South Connector was analyzed under combined (2026) – Full Buildout traffic conditions with proposed lane configurations and traffic control. Refer to Table 13 for a summary of the analysis results. Refer to Appendix M for the Synchro capacity analysis reports.

**Table 13: Analysis Summary of Jessie Drive and North-South Connector**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2026) Conditions – Full Buildout	EB WB NB SB	<b>1 LT, 1 TH-RT</b> <b>1 LT, 1 TH-RT</b> 1 LT-TH-RT 1 LT-TH-RT	A <sup>1</sup> A <sup>1</sup> B <sup>2</sup> B <sup>2</sup>	N/A	A <sup>1</sup> A <sup>1</sup> B <sup>2</sup> B <sup>2</sup>	N/A

1. Level of service for major-street left-turn movement.
  2. Level of service for minor-street approach.
- Improvements by Developer in **Bold**.  
Expected Town Improvements are in **red**.

Capacity analysis of combined (2026) – Full Buildout traffic conditions indicate that the minor-street approaches and major-street left-turn movements at the intersection of Jessie Drive and North-South Connector are expected to operate at LOS B or better during both weekday AM and PM peak hours. Although not needed from a level of service standpoint, left-turn lanes are recommended for the eastbound and westbound approaches according to the *Warrant for Left and Right-Turn Lanes* chart included in the NCDOT Driveway Manual.

**7.10. Jessie Drive and Site Drive #1**

The proposed unsignalized intersection of Jessie Drive and Site Drive #1 was analyzed under combined (2026) – Full Buildout traffic conditions with the lane configurations shown in Table 14. Refer to Table 14 for a summary of the analysis results. Refer to Appendix N for the Synchro capacity analysis reports.

**Table 14: Analysis Summary of Jessie Drive and Site Drive #1**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2026) Conditions – Full Buildout	EB WB NB SB	<b>1 LT, 1 TH-RT</b> <b>1 LT, 1 TH-RT</b> 1 LT-TH-RT 1 LT-TH-RT	A <sup>1</sup> A <sup>1</sup> B <sup>2</sup> C <sup>2</sup>	N/A	A <sup>1</sup> A <sup>1</sup> B <sup>2</sup> C <sup>2</sup>	N/A

1. Level of service for major-street left-turn movement.

2. Level of service for minor-street approach.

Improvements by Developer in **Bold**.

Expected Town Improvements are in **red**.

Capacity analysis of combined (2026) – Full Buildout traffic conditions indicate that the minor-street approaches and major-street left-turn movements at the intersection of Jessie Drive and Site Drive #1 are expected to operate at LOS C or better during both weekday AM and PM peak hours. Although not needed from a level of service standpoint, left-turn lanes are recommended for the eastbound and westbound approaches according to the *Warrant for Left and Right-Turn Lanes* chart included in the NCDOT Driveway Manual.

**7.11. Jessie Drive and Site Drive #2**

The proposed unsignalized intersection of Jessie Drive and Site Drive #2 was analyzed under combined (2026) – Full Buildout traffic conditions with the lane configurations shown in Table 15. Refer to Table 15 for a summary of the analysis results. Refer to Appendix O for the Synchro capacity analysis reports.

**Table 15: Analysis Summary of Jessie Drive and Site Drive #2**

ANALYSIS SCENARIO	A P P R O A C H	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
Combined (2026) Conditions – Full Buildout	EB WB NB	<b>1 TH-RT</b> <b>1 LT, 1 TH</b> <b>1 LT-RT</b>	-- A <sup>1</sup> B <sup>2</sup>	N/A	-- A <sup>1</sup> B <sup>2</sup>	N/A

1. Level of service for major-street left-turn movement.
  2. Level of service for minor-street approach.
- Improvements by Developer in **Bold**.  
Expected Town Improvements are in **red**.

Capacity analysis of combined (2026) – Full Buildout traffic conditions indicate that the minor-street approach and major-street left-turn movement at the intersection of Jessie Drive and Site Drive #2 are expected to operate at LOS B or better during both weekday AM and PM peak hours. Although not needed from a level of service standpoint, a left-turn lane is recommended for the westbound approach according to the *Warrant for Left and Right-Turn Lanes* chart included in the NCDOT Driveway Manual.

## 8. CONCLUSIONS

This Traffic Impact Analysis Update was conducted to determine the potential traffic impacts of the proposed Horton Park development, located between E. Williams Street and Smith Road and south of Ten-Ten Road in Apex, North Carolina. The proposed development is expected to be a mixed-use development and be built out in phases, with completion of Phase 1 expected in 2024 and Full Buildout in 2026. Phase 1 of the development is expected to provide site access via connections to Dezola Street to the east and Colby Chase Drive to the west. Under Full Buildout, the development is expected to provide additional site access via three (3) full movement driveways on Jessie Drive Extension.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios:

- Existing (2019) Traffic Conditions
- Background (2024) Traffic Conditions
- Background (2026) Traffic Conditions
- Combined (2024) Traffic Conditions – Phase 1
- Combined (2026) Traffic Conditions – Full Buildout

### Trip Generation

It is estimated that Phase 1 of the proposed development will generate approximately 3,740 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 274 trips (67 entering and 207 exiting) will occur during the weekday AM peak hour and 359 (227 entering and 132 exiting) will occur during the weekday PM peak hour.

Full Buildout of the proposed development is estimated to generate approximately 8,270 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 547 trips (182 entering and 365 exiting) will occur during the AM peak hour and 657 (379 entering and 278 exiting) will occur during the PM peak hour.

### Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to the Town’s UDO and NCDOT Congestion Management Guidelines. Refer to section 6.1 of this report for a detailed description of any adjustments to these guidelines made throughout the analysis.

### Intersection Capacity Analysis Summary

All the study area intersections (including the proposed site driveways) are expected to operate at acceptable levels-of-service under existing and future year conditions with the exception of the intersections listed below. A summary of the study area intersections that are expected to need improvements are as follows:

#### Ten-Ten Road and Jessie Drive

The intersection of Ten-Ten Road and Jessie Drive is expected to be improved by widening along Ten-Ten Road as part of the U-5825B project and turn-lane improvements as part of the Town’s LAPP funded project to extend Jessie Drive from Ten-Ten Road to NC 55. These projects do not have finalized designs, therefore laneage was assumed per coordination with NCDOT and Town staff. Under full buildout conditions, when the proposed development is expected to provide access to Jessie Drive Extension, a signal was considered according to methodology contained in the MUTCD and is expected to meet the weekday AM and PM peak hour warrants for signalization. Under combined (2026) – Full Buildout conditions with signalization, the intersection is expected to operate at an overall LOS B during the weekday AM and PM peak hours. It is recommended that the proposed development monitor this intersection for signalization after construction of the first Site Driveway onto Jessie Drive / Jessie Drive Extension.

#### Smith Road and Stephenson Road

The unsignalized intersection of Smith Road and Stephenson Road is expected to operate at LOS F on the minor-street approach during the weekday PM peak hour under background (2024), background (2026), combined (2024) – Phase 1, and combined (2026) – Full Buildout conditions. A signal was considered at the intersection according to the methodology contained in the MUTCD but is only expected to meet the weekday PM peak hour warrants for

a signal. An eastbound left-turn lane is recommended to accommodate the additional eastbound traffic expected at the intersection.

#### Technology Drive / E. Williams Street and NC 55 / NC 55 Bypass

The intersection of Technology Drive / E. Williams Street and NC 55 / NC 55 Bypass is expected to operate at an overall LOS F during the weekday AM peak hour and LOS E during the weekday PM peak hour under background (2024), background (2026), combined (2024) – Phase 1, and combined (2026) – Full Buildout conditions.

Under Full Buildout conditions, the proposed development is expected to increase the overall intersection delay by 8 seconds during the weekday AM peak hour and 4 seconds during the weekday PM peak hour. The proposed development is expected to have a larger impact at this intersection under Phase 1 conditions with the operations improving under full buildout due to the additional site accesses that will be opened up to Jessie Drive and the Jessie Drive Extension. These additional accesses are expected to reduce the number of site trips that will use this intersection. Per the Town UDO, if background conditions are expected to operate at an overall LOS E or worse the development must improve the intersection if the development's traffic is greater than or equal to 10% of the weekday AM or PM peak hour traffic when compared to the background traffic conditions. It should be noted that the development is expected to add approximately 1% of traffic to the intersection during the weekday AM and PM peak hours in Phase 1 and Full Buildout conditions. Signal timing modifications were

Despite the minor impact at the subject intersection, signal timing improvements were considered to improve the intersection to an overall LOS E or better under all analysis conditions. These improvements will likely be implemented periodically by NCDOT and are therefore not recommended for the subject development.

#### E. Williams Street and Straywhite Avenue

The minor-street approach of Straywhite Avenue at E. Williams Street is expected to operate at LOS F under all analysis conditions. Although it is not uncommon for a minor-street approach to operate with significant delay with a high volume of through traffic on the



mainline, a signal was considered according to methodology contained in the MUTCD. The intersection is expected to only meet peak hour warrants for signalization during the weekday AM peak hour under Phase 1 and Full Buildout conditions. Due to the residential nature of this area, it is not expected that the intersection would meet the 4 or 8-hour warrants for a signal, which the NCDOT typically require. Additionally, the intersection of E. Williams Street / Technology Drive and NC 55 / NC 55 Bypass is located approximately 1,400 feet north of this intersection. Per SimTraffic simulations of the weekday AM peak hour under existing (2019) conditions, the westbound approach at this upstream signal (E. Williams Street), queues beyond the Straywhite Avenue intersection. Due to these reasons, signalization is not recommended by the proposed development. Additionally, traffic exiting Straywhite Avenue during the weekday AM peak hour would likely be given courtesy gaps by motorists on E. Williams Street, allowing for egress with significantly less delay than modeled by Synchro.

The subject development is expected to account for approximately 2% of the traffic at this intersection during the weekday AM peak hour and 3% during the weekday PM peak hour under combined (2024) – Phase 1 conditions. Despite the relatively low impact expected by the proposed development, it is recommended that the proposed Horton Park development monitor this intersection for signalization through buildout of Phase 1 of the development and install a signal when warranted and approved by NCDOT. Due to the additional site access provided to Jessie Drive under Full Buildout conditions, if signalization is not warranted under Phase 1 conditions, it is recommended that this requirement be eliminated.

The westbound approach of Straywhite Avenue at E. Williams Street is approximately 21 feet in width. Due to this available pavement, it is recommended that Straywhite Avenue be restriped to provide an exclusive left and right-turn lane at E. Williams Street.

## 9. RECOMMENDATIONS

Based on the findings of this study, specific geometric improvements have been identified and are recommended to accommodate future traffic conditions. See a more detailed description of the recommended improvements below. Refer to Figure 15A for an illustration of the Phase 1 recommended lane configuration for the proposed development and 15B for the Full Buildout recommended lane configurations.

### Recommended Improvements by TIP U-5825B

- Widen Ten-Ten Road to a minimum four lane, median divided, cross-section throughout the study area.

#### Ten-Ten Road and Jessie Drive

- Provide three (3) eastbound through lanes and two (2) westbound through lanes on Ten-Ten Road with full length storage.
- Provide an exclusive westbound left-turn lane on Ten-Ten Road with a minimum of 400 feet of storage and appropriate taper.

#### Ten-Ten Road and Smith Road

- Provide two (2) eastbound through lanes and two (2) westbound through lanes on Ten-Ten Road with full length storage.
- Provide an exclusive westbound left-turn lane on Ten-Ten Road with a minimum of 400 feet of storage and appropriate taper.
- Provide an exclusive eastbound U-turn lane on Ten-Ten Road with a minimum of 400 feet of storage and appropriate taper.
- Provide an exclusive eastbound right-turn lane on Ten-Ten Road with full length storage.
- Provide exclusive dual northbound left-turn lanes on Smith Road, one as a two-way left-turn lane extending to Stephenson Road and one with full length storage.
- Provide an exclusive northbound right-turn lane on Smith Road with a minimum of 250 feet of storage and appropriate taper.

**Recommended Improvements by Town (Jessie Drive Extension)**

- Extend Jessie Drive from NC 55 to Ten-Ten Road with a two-lane cross-section.

Ten-Ten Road and Jessie Drive

- Construct an exclusive northbound right-turn lane on Jessie Drive with a minimum of 200 feet of storage and appropriate taper.
- Construct an exclusive eastbound right-turn lane on Ten-Ten Road with a minimum of 100 feet of storage and appropriate taper.

NC 55 and Jessie Drive Extension

- Construct a left-over intersection with a median on NC 55 restricting westbound left-turn movements from Jessie Drive Extension.
- Monitor for signalization and install once warranted and approved by NCDOT.
- Construct an exclusive northbound right-turn lane on NC 55 with a minimum of 150 feet of storage and appropriate taper.
- Construct an exclusive southbound left-turn lane on NC 55 with a minimum of 250 feet of storage and appropriate taper.

NC 55 and Jessie Drive Extension

- Construct a U-turn intersection and bulb-out on NC 55, north of Jessie Drive Extension.
- Construct an exclusive northbound U-turn lane on NC 55 with a minimum of 250 feet of storage and appropriate taper.

**Recommended Improvements by Developer – Phase 1**

Smith Road and Stephenson Road

- Construct an eastbound left-turn lane on Smith Road with a minimum of 100 feet of storage and appropriate taper.

Smith Road and Dezola Street

- Construct a southbound right-turn lane on Smith Road with a minimum of 75 feet of storage and appropriate taper.

E. Williams Street and Straywhite Avenue

- Restripe the westbound approach on Straywhite Avenue to provide two (2) westbound egress lanes, an exclusive left-turn lane with full length storage and an exclusive right-turn lane with a minimum of 200 feet of storage and appropriate taper.

**Recommended Improvements by Developer – Full Buildout**

Ten-Ten Road and Jessie Drive

- Monitor for signalization and install if warranted and approved by NCDOT after site driveway connections to Jessie Drive / Jessie Drive Extension are constructed.

Jessie Drive / Jessie Drive Extension and North-South Connector

- Construct a stop controlled northbound approach with one (1) ingress and one (1) egress lane.
- Construct a stop controlled southbound approach with one (1) ingress and one (1) egress lane.
- Construct an exclusive eastbound left-turn lane on Jessie Drive Extension with a minimum of 75 feet of storage and appropriate taper.
- Construct an exclusive westbound left-turn lane on Jessie Drive with a minimum of 75 feet of storage and appropriate taper.

Jessie Drive and Site Drive #1

- Construct a stop controlled northbound approach with one (1) ingress and one (1) egress lane.
- Construct a stop controlled southbound approach with one (1) ingress and one (1) egress lane.

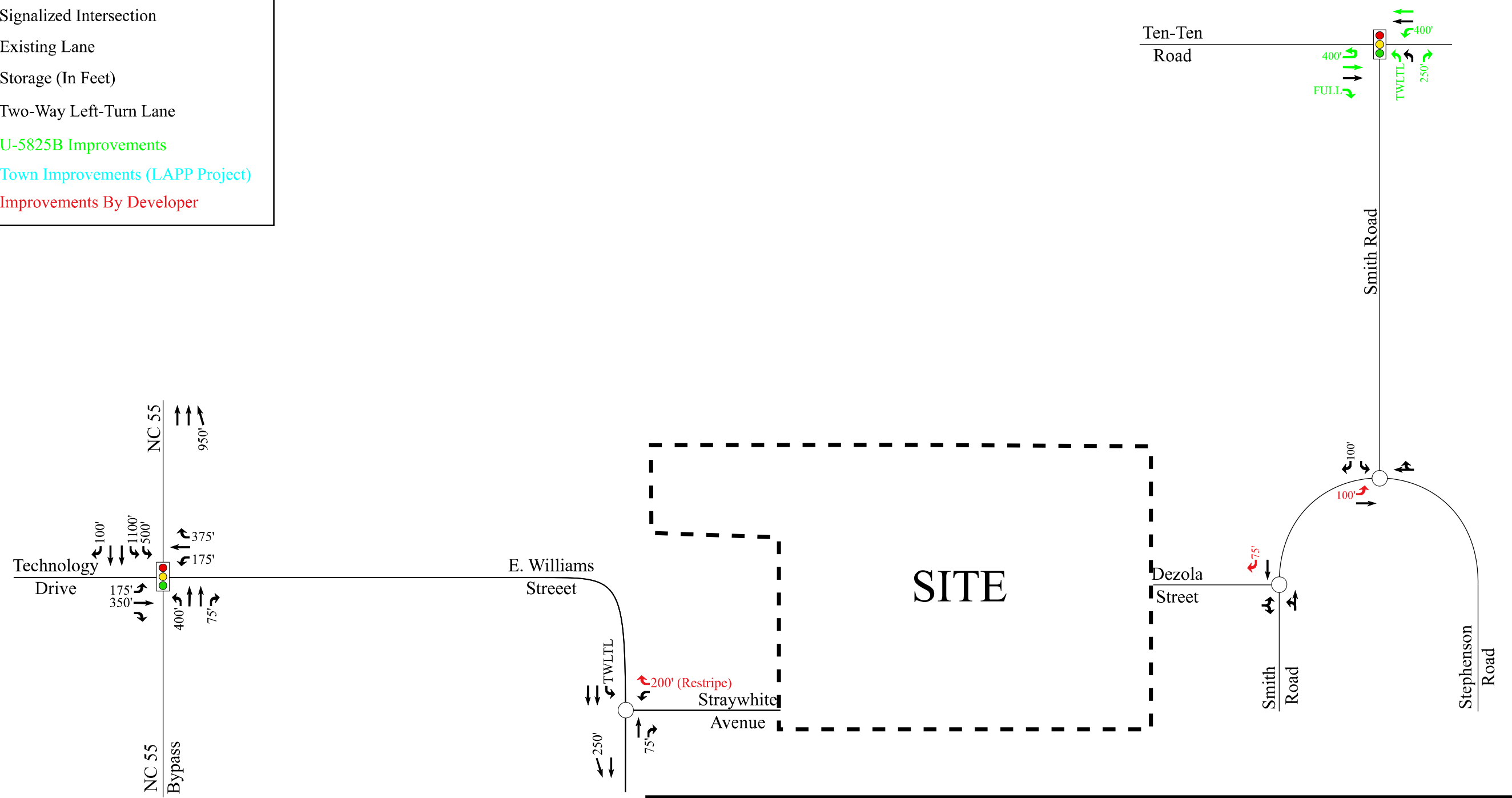
- Construct an exclusive eastbound left-turn lane on Jessie Drive with a minimum of 50 feet of storage and appropriate taper.
- Construct an exclusive westbound left-turn lane on Jessie Drive with a minimum of 75 feet of storage and appropriate taper.

Jessie Drive and Site Drive #2

- Construct a stop controlled northbound approach with one (1) ingress and one (1) egress lane.
- Construct an exclusive westbound left-turn lane on Jessie Drive with a minimum of 50 feet of storage and appropriate taper.

**LEGEND**

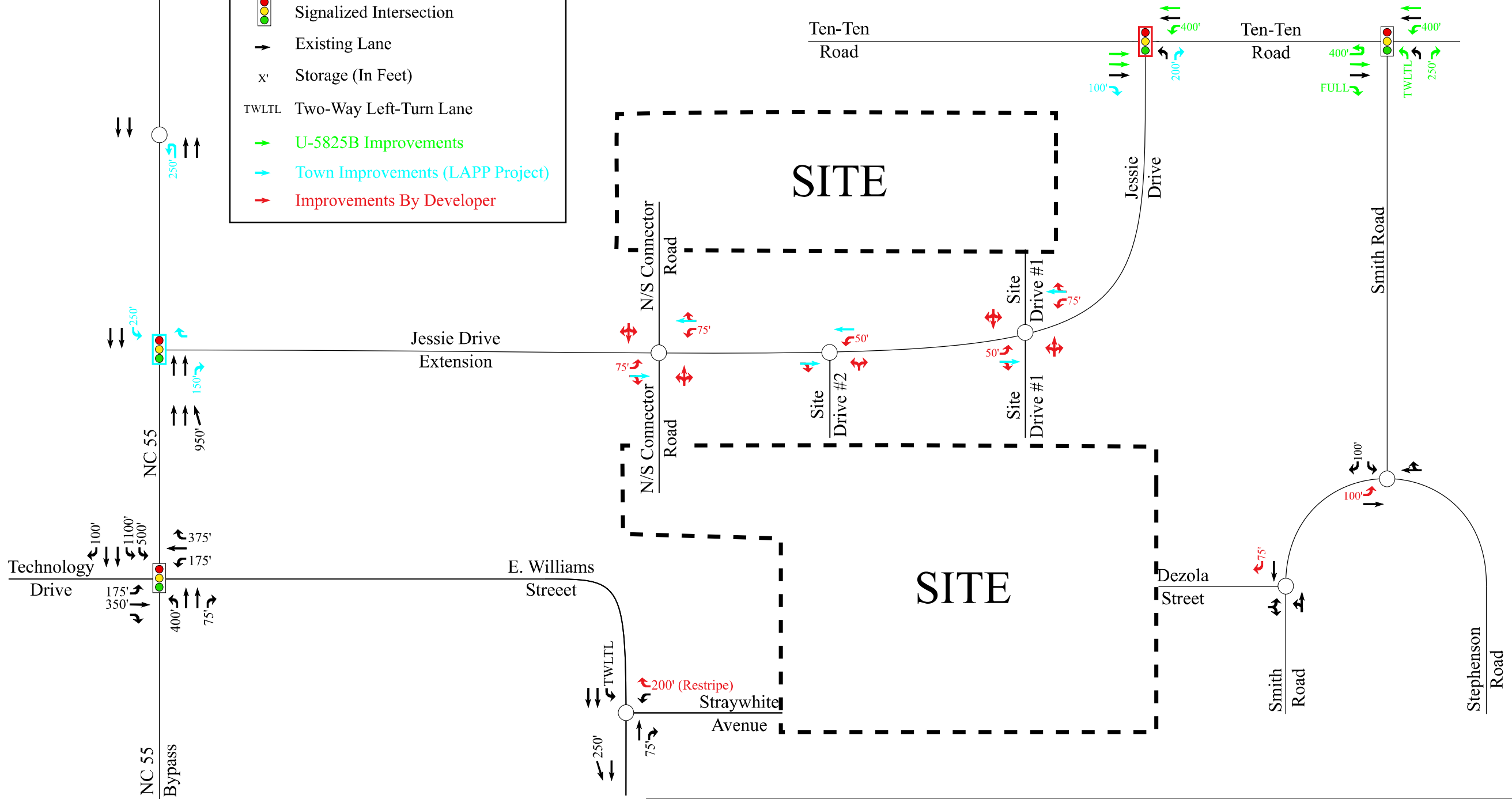
- Unsignalized Intersection
- ◫ Signalized Intersection
- Existing Lane
- x' Storage (In Feet)
- TWLTL Two-Way Left-Turn Lane
- U-5825B Improvements
- Town Improvements (LAPP Project)
- Improvements By Developer




 <p><b>RAMEY KEMP &amp; ASSOCIATES</b> TRANSPORTATION ENGINEERS</p>	<p>Horton Park Update Apex, NC</p>	<p>Recommended Improvements - Phase 1</p>
	<p>Scale: Not to Scale</p>	<p>Figure 15A</p>

**LEGEND**

- Unsignalized Intersection
- ◫ Signalized Intersection
- Existing Lane
- x' Storage (In Feet)
- TWLTL Two-Way Left-Turn Lane
- U-5825B Improvements
- Town Improvements (LAPP Project)
- Improvements By Developer



	<p>Horton Park Update Apex, NC</p>	<p>Recommended Improvements - Full Buildout</p>
	<p>Scale: Not to Scale      Figure 15B</p>	



Charleston, SC - Charlotte, NC - Columbia, SC - Raleigh, NC - Richmond, VA - Winston-Salem, NC



# **TECHNICAL APPENDIX**

# **APPENDIX A**

## **MEMORANDUM OF UNDERSTANDING (MOU)**

## Nate Bouquin

---

**From:** Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>  
**Sent:** Friday, June 21, 2019 1:49 PM  
**To:** Nate Bouquin; Brennan, Sean P; Wheeler, Millard S; Russell Dalton  
**Cc:** Ishak, Doumit Y; Bunting, Clarence B; Walker, Braden M; Joshua Reinke  
**Subject:** RE: Horton Park TIA Update MOU  
**Attachments:** MOU - Horton Park TIA Update 6.21.19.pdf

Hi Nate,

Please see my comments attached. I would like to ask you to revise your trip distribution and assignment for the residential piece to more closely match the distribution in the original TIA and the TIA addendum completed in 2017. I don't believe that 15% of traffic will come to/from northwest NC 55, considering improvements on Ten Ten will make that a preferred route over the congested NC 55, (especially considering the tricky left turn movement from NC 55 unto E Williams St at Technology Drive, and the hassle of weaving through the Straywhite neighborhood).

Also please consider 5% coming from the south Via Stephenson Road as you did previously.

- 60% to/from the west via Ten-Ten Road
- 5% to/from the south via E. Williams Street
- 10% to/from the south via NC 55 Bypass
- 5% ← • ~~15%~~ to/from the northwest via NC 55
- 15% ← • ~~10%~~ to/from the east via Ten-Ten Road
- 5% to/from the south via Stephenson Road

Thank you

Serge Grebenschikov, PE  
Traffic Engineer  
Public Works & Transportation – Traffic  
73 Hunter Street, 3<sup>rd</sup> Fl  
PO Box 250  
Apex, NC 27502  
P: (919) 372-7448  
E: Serge.Grebenschikov@apexnc.org

**From:** Nate Bouquin [mailto:nbouquin@rameykemp.com]  
**Sent:** Friday, June 21, 2019 10:16 AM  
**To:** Brennan, Sean P <spbrennan@ncdot.gov>; Wheeler, Millard S <mwheeler@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>; Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>  
**Cc:** Ishak, Doumit Y <dishak@ncdot.gov>; Bunting, Clarence B <cbunting@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Joshua Reinke <jreinke@rameykemp.com>  
**Subject:** Horton Park TIA Update MOU

Gentlemen,

Per our meeting last week, attached is a MOU for the Horton Park TIA Update. This should have addressed everything discussed during our scoping meeting. We are hoping to have a quick turnaround on this project, so if we could get MOU comments back within the next couple business days we would really appreciate it.

A couple brief items that we would like to request for this:

- Town: TIA for the Stop & Go Gas Station
- NCDOT: 25% plans for U-5825B

Please let me know if there are any questions.

Have a great weekend everyone!

Nate Bouquin, EI  
Transportation Associate



5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
919-872-5115 (Office)  
919-987-1301 (Direct)

*Proudly serving the Southeast since 1992.*



## Nate Bouquin

---

**From:** Brennan, Sean P <spbrennan@ncdot.gov>  
**Sent:** Tuesday, June 25, 2019 11:43 AM  
**To:** Nate Bouquin; Wheeler, Millard S; Russell Dalton; Serge Grebenschikov  
**Cc:** Ishak, Doumit Y; Bunting, Clarence B; Walker, Braden M; Joshua Reinke  
**Subject:** RE: [External] Horton Park TIA Update MOU

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

Nate,

I'm okay with the MOU.

Regards,

**Sean Brennan, PE**  
Senior Assistant District Engineer  
Division 5/District 1  
Department of Transportation

919-733-3213 office  
919-715-5778 fax  
[spbrennan@ncdot.gov](mailto:spbrennan@ncdot.gov)

4009 District Drive (Physical Address)  
Raleigh, NC 27607

1575 Mail Service Center (Mailing Address)  
Raleigh, NC 27699-1575



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

---

**From:** Nate Bouquin <nbouquin@rameykemp.com>  
**Sent:** Friday, June 21, 2019 10:16 AM  
**To:** Brennan, Sean P <spbrennan@ncdot.gov>; Wheeler, Millard S <mwheeler@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>; Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>  
**Cc:** Ishak, Doumit Y <dishak@ncdot.gov>; Bunting, Clarence B <cbunting@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Joshua Reinke <jreinke@rameykemp.com>  
**Subject:** [External] Horton Park TIA Update MOU

**CAUTION:** External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to [report\\_spam@nc.gov](mailto:report_spam@nc.gov)

Gentlemen,

Per our meeting last week, attached is a MOU for the Horton Park TIA Update. This should have addressed everything discussed during our scoping meeting. We are hoping to have a quick turnaround on this project, so if we could get MOU comments back within the next couple business days we would really appreciate it.

A couple brief items that we would like to request for this:

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Please let me know if there are any questions.

Have a great weekend everyone!

Nate Bouquin, EI  
Transportation Associate



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RAMEY KEMP & ASSOCIATES, INC.  
5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
Phone: 919-872-5115  
www.rameykemp.com

June 21, 2019

Russell Dalton, PE  
Town of Apex, Public Works & Transportation  
919-249-3358  
Russell.Dalton@apexnc.org

Reference: Horton Park TIA Update  
Apex, North Carolina

Subject: Memorandum of Understanding for TIA Report

Dear Mr. Dalton:

The following is a Memorandum of Understanding (MOU) outlining the proposed scope of work and assumptions related to the Updated Traffic Impact Analysis (TIA) for the proposed Horton Park mixed use development, to be located west of Smith Road and north of Colby Chase Drive in Apex, North Carolina. Refer to the attached site location map. The development is expected to be phased with Phase 1 site access being provided via one (1) full movement intersection on Smith Road (at existing Dezola Street) and one (1) full movement intersection on Colby Chase Drive. Under Full Buildout conditions, the Jessie Drive extension to NC Highway 55 is assumed to be completed and the development is expected to connect to Jessie Drive. Full buildout site access will add two (2) full movement driveway connections to Jessie Drive. Phase 1 is expected to be built out in 2024 and full buildout is expected in 2026. The proposed site is expected to consist of approximately 290 single family homes and 134 townhomes under Phase 1 conditions. Full Buildout is expected to consist of a total of 290 single family homes, 212 townhomes, 356 apartments, 40,000 square feet (s.f.) of warehouse, and 40,000 s.f. of business park. A preliminary site plan is attached.

The contents of this MOU were determined during the TIA scoping meeting on June 10, 2019 attended by NCDOT District staff, NCDOT Congestion Management Staff, Town of Apex Staff, RKA, and Peak Engineering.

### **Study Area**

Based on coordination with the Town of Apex (Town) and the North Carolina Department of Transportation (NCDOT), the study area is proposed to consist of the following intersections:

Phase 1:

- Ten-Ten Road and Smith Road
- Smith Road and Stephenson Road / Smith Road

- Smith Road and Dezola Street
- E. Williams Street and Straywhite Avenue
- E. Williams Street / Technology Drive and NC 55

Full Buildout:

- Ten-Ten Road and Smith Road
- Smith Road and Stephenson Road / Smith Road
- Smith Road and Dezola Street
- E. Williams Street and Straywhite Avenue
- E. Williams Street / Technology Drive and NC 55
- Jessie Drive Extension and NC 55
- Ten-Ten Road and Jessie Drive
- Jessie Drive and Proposed Site Driveway(s)

**Existing Traffic Volumes**

Peak hour turning movement counts utilized in the original Horton Park TIA will be utilized and grown to 2019 according to a 3% average annual growth rate for existing conditions. These traffic counts were conducted by RKA in May 2017 and March 2016 during the weekday AM (7:00 to 9:00) and weekday PM (4:00 to 6:00) peak hours while schools were in session. It should be noted that the counts at the intersection of E. Williams Street and Straywhite Avenue were determined according to a trip generation for the existing development and through volumes were pulled from the Bobbitt Road and E. Williams Street intersection. The traffic counts at the intersection of Technology Drive / E. Williams Street and NC 55 were determined according to the 2017 TIA conducted by Gannett Fleming for the Trinity Apex Development. Signal information was obtained from the NCDOT. Refer to the attached existing (2019) traffic volumes figure.

**Trip Generation**

Average weekday daily, AM peak hour, and PM peak hour trips for the proposed development were estimated using methodology contained within the ITE *Trip Generation Manual*, 10<sup>th</sup> Edition. Refer to Table 1 for a detailed breakdown of the proposed site trip generation under Phase 1 conditions and Table 2 for the site trip generation under Full Buildout conditions. In order to present a conservative analysis of Full Buildout conditions, internal capture was not included in this analysis.



**Table 1: Trip Generation Summary – Phase 1**

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Enter	Enter	Exit
Single-Family Detached Housing (210)	290 Units	2,770	53	158	178	104
Multifamily Housing (Low-Rise) (220)	134 Units	970	14	49	49	28
<b>Total Trips</b>		<b>3,740</b>	<b>67</b>	<b>207</b>	<b>227</b>	<b>132</b>

It is estimated that Phase 1 of the proposed development will generate approximately 3,740 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 274 trips (67 entering and 207 exiting) will occur during the AM peak hour and 359 (227 entering and 132 exiting) will occur during the PM peak hour.

**Table 2: Trip Generation Summary – Full Buildout**

Land Use (ITE Code)	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Enter	Enter	Exit
Single-Family Detached Housing (210)	290 Units	2,770	53	158	178	104
Multifamily Housing (Low-Rise) (220)	568 Units	4,250	57	191	175	102
Warehouse (150)	40,000 s.f.	110	23	7	9	24
Business Park (770)	40,000 s.f.	1,140	49	9	17	48
<b>Total Trips</b>		<b>8,270</b>	<b>182</b>	<b>365</b>	<b>379</b>	<b>278</b>

It is estimated that the proposed development will generate approximately 8,270 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 547 trips (182 entering and 365 exiting) will occur during the AM peak hour and 657 (379 entering and 278 exiting) will occur during the PM peak hour.

**Trip Distribution and Assignment**

The primary site trips are distributed based on the locations of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the overall residential distributions (Phase 1 and Full Buildout) is below:

- 60% to/from the west via Ten-Ten Road
- 5% to/from the south via E. Williams Street
- 10% to/from the south via NC 55 Bypass
- 15% to/from the northwest via NC 55
- 10% to/from the east via Ten-Ten Road

A summary of the overall industrial distribution is below:

- 45% to/from the west via Ten-Ten Road
- 5% to/from the south via Stephenson Road
- 5% to/from the south via NC 55 Bypass
- 15% to/from the northwest via NC 55
- 30% to/from the east via Ten-Ten Road

Refer to the attached trip distribution figure for a more detailed visualization of the proposed trip distribution.

### **Analysis Scenarios**

All capacity analyses will be performed utilizing Synchro (Version 10.3). All study intersections will be analyzed during the weekday AM and PM peak hours under the following proposed traffic scenarios:

- Existing (2019)
- Background (2024)
- Background (2026)
- Combined (2024)
- Combined (2026)

### **Background Traffic Volumes**

Based on a review of traffic growth patterns and adjacent development information, background traffic volumes will be determined by projecting existing (2019) traffic volumes to the build-out year using a proposed 3% annually compounded growth rate. It was also determined, through coordination with the Town and NCDOT that the following adjacent development would be included under background and combined conditions according to the approved TIA for the development:

- Stop & Go Gas Station

U-5825B is a funded NCDOT roadway project, expected to widen Ten-Ten Road to a four-lane median divided roadway from US Highway 1 to Kildaire Farm Road. This project is expected to begin construction in 2023. Per coordination with NCDOT and the Town, these improvements will be assumed complete under all future conditions and will be included according to the 25% concept plans provided by NCDOT.

NC-540 extension was also considered but is not expected to be completed by Full Buildout of the Horton Park development. Due to this, NC-540 extension will not be assumed in this analysis.

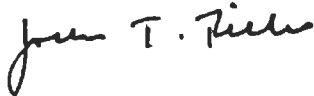
**Report**

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

If you find this memorandum of understanding acceptable, please let me know so that we may include it in the TIA report. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,

*Ramey Kemp & Associates, Inc.*



Joshua Reinke, P.E.  
Transportation Engineer

Attachments: Site Location Map  
Preliminary Site Plan  
Existing (2019) Traffic Volumes Figure  
Primary Site Trip Distribution Figures

Cc: Serge Grebenshikov, Town of Apex  
Sean Brennan, NCDOT  
Scott Wheeler, NCDOT  
NCDOT Congestion Management

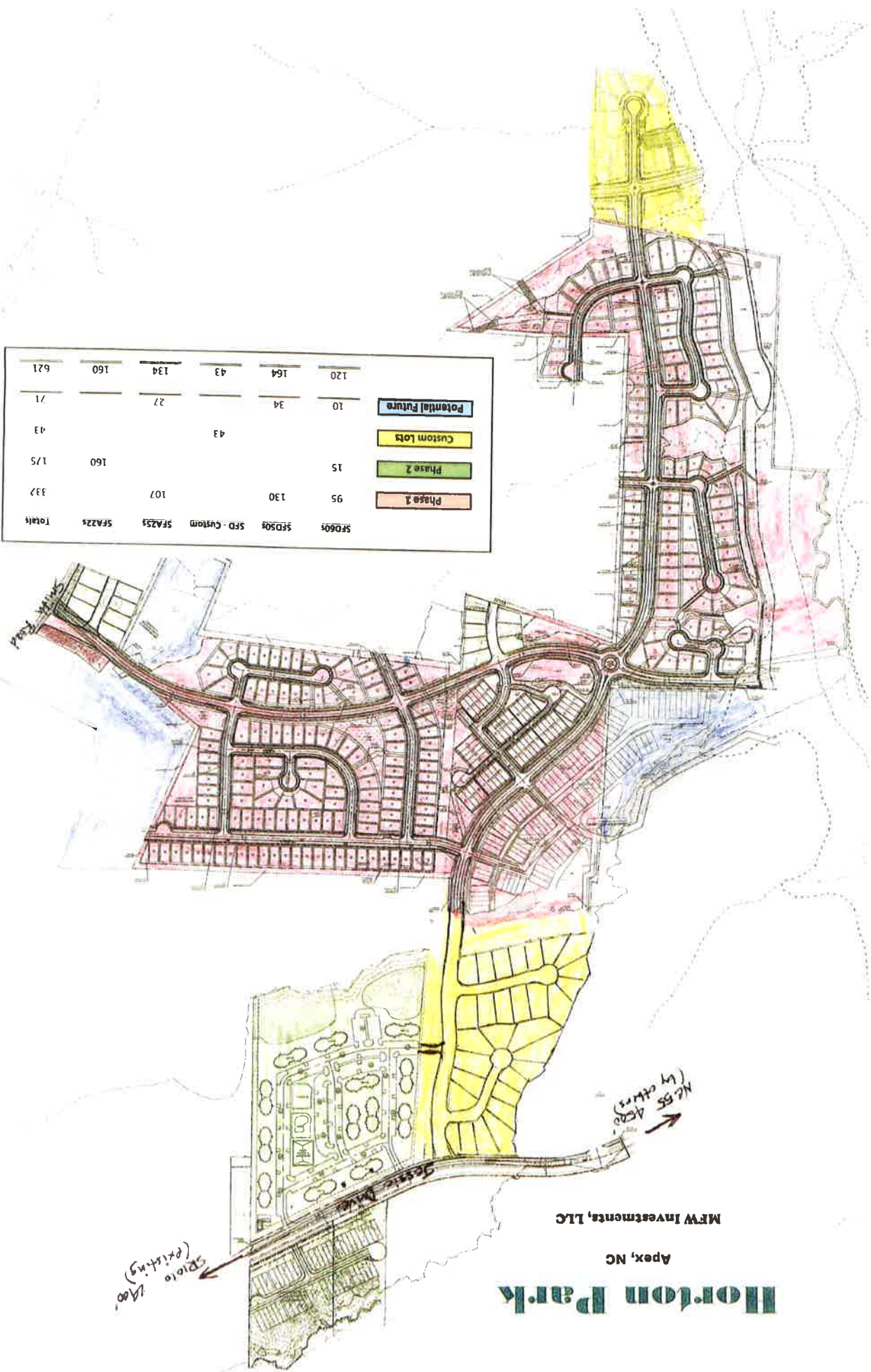
# Horton Park

Apex, NC

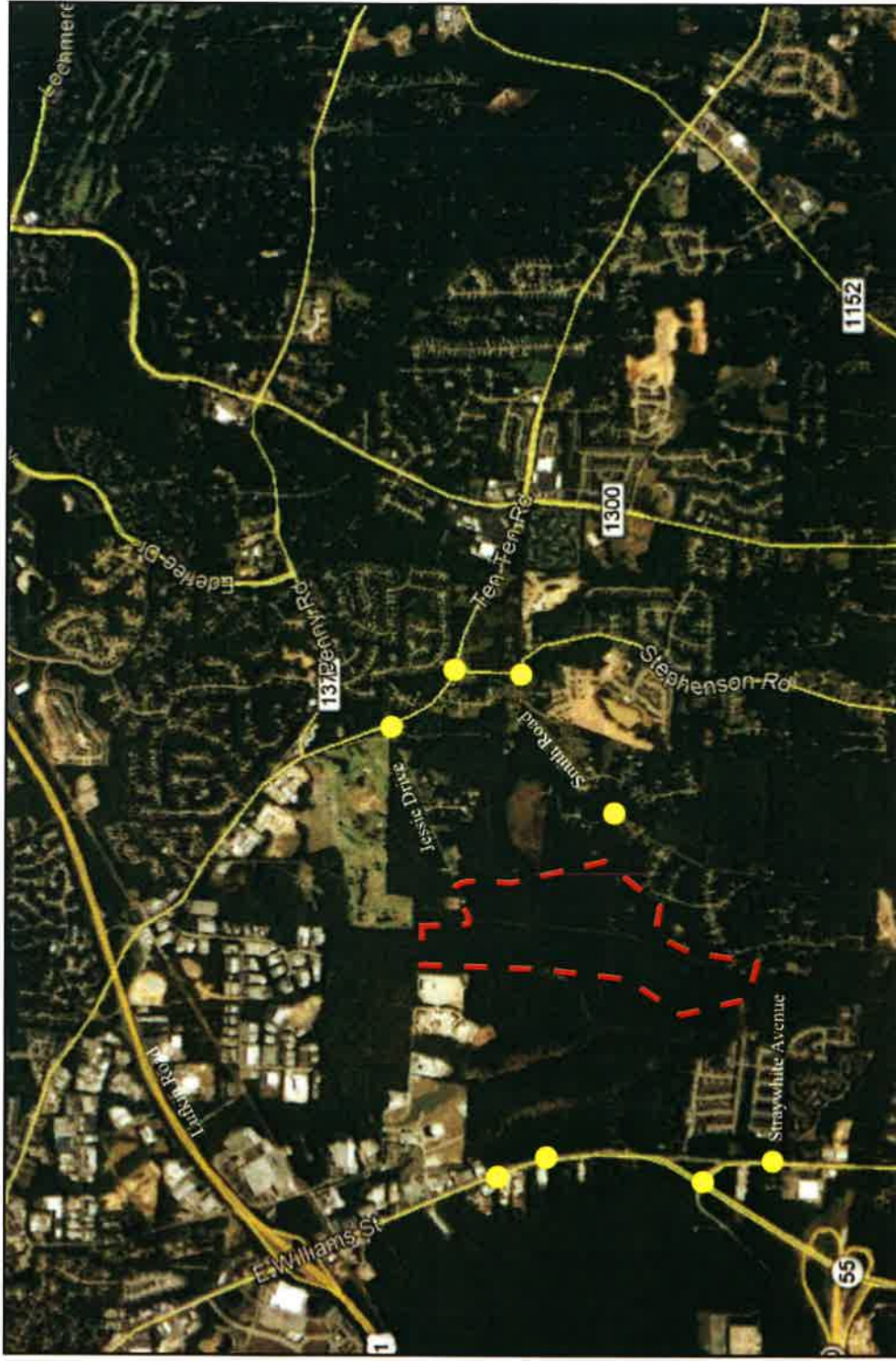
MFW Investments, LLC

NC-55 Ave  
(by others)

SP1010 (existing)  
1A00



	SFD504	SFD - Custom	SFA255	SFA225	Totals
Potential Future	120	43	134	160	621
Custom Lots	10	43	27		71
Phase 2	15			160	175
Phase 1	95	130	107		332
<b>Totals</b>	<b>220</b>	<b>213</b>	<b>268</b>	<b>160</b>	<b>861</b>



**Horton Park Update**  
Apex, NC

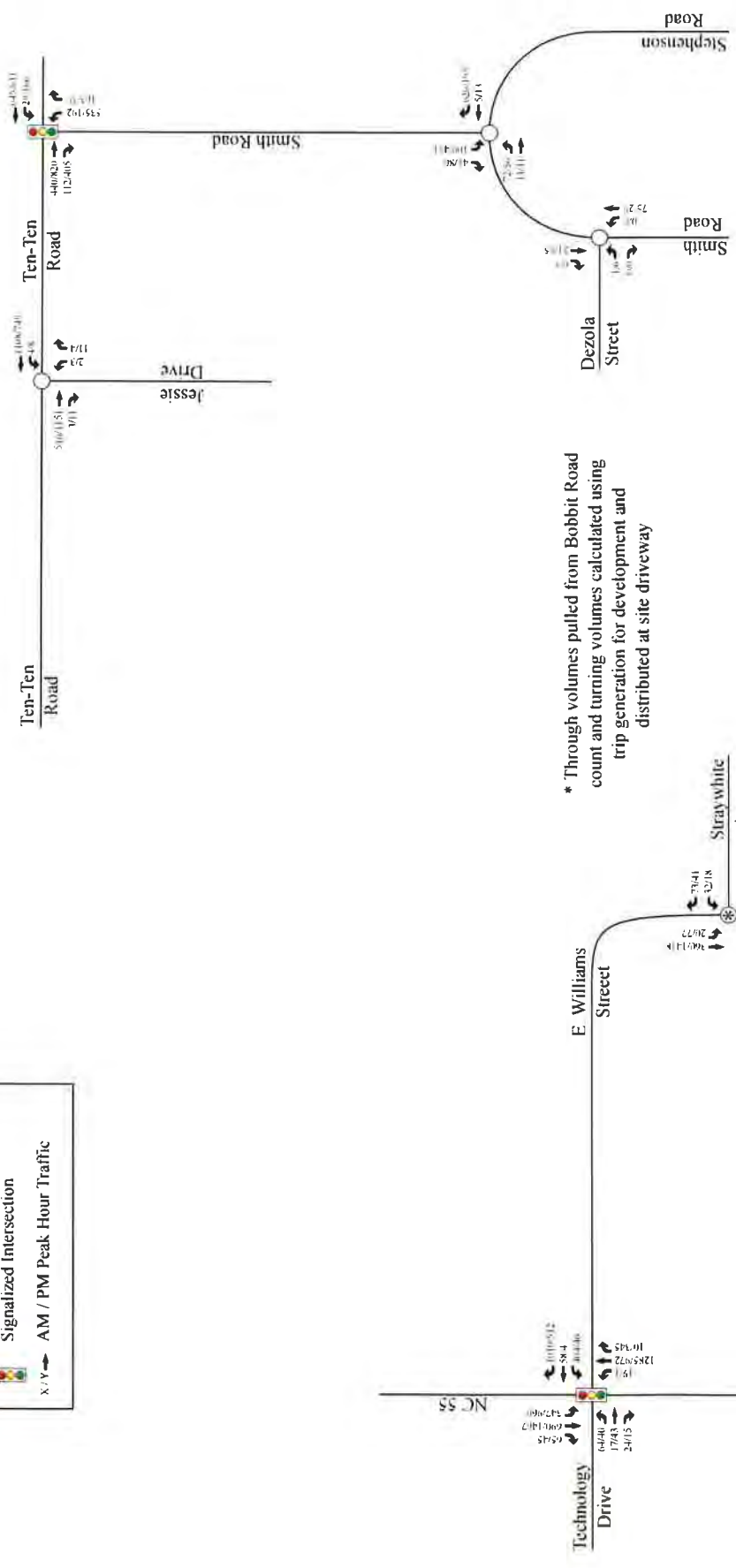
Site Location Map

Scale: Not to Scale

Figure 1

**LEGEND**

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



\* Through volumes pulled from Bobbit Road count and turning volumes calculated using trip generation for development and distributed at site driveway



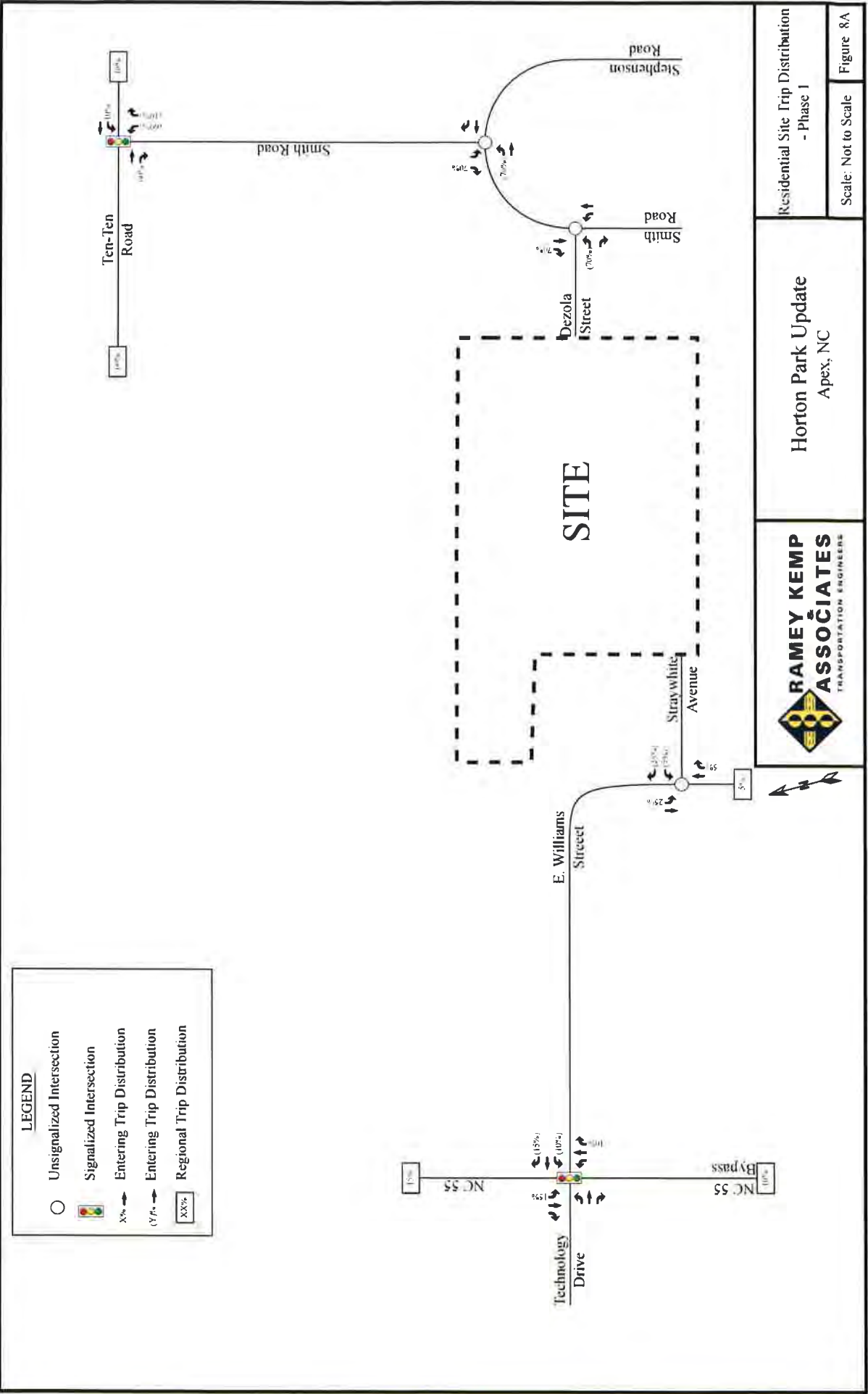
**Horton Park Update**  
Apex, NC

Existing (2019)  
Peak Hour Traffic Volumes

Scale: Not to Scale      Figure 4

**LEGEND**

- Unsignalized Intersection
- ◫ Signalized Intersection
- X% Entering Trip Distribution
- (Y%) Entering Trip Distribution
- XX% Regional Trip Distribution

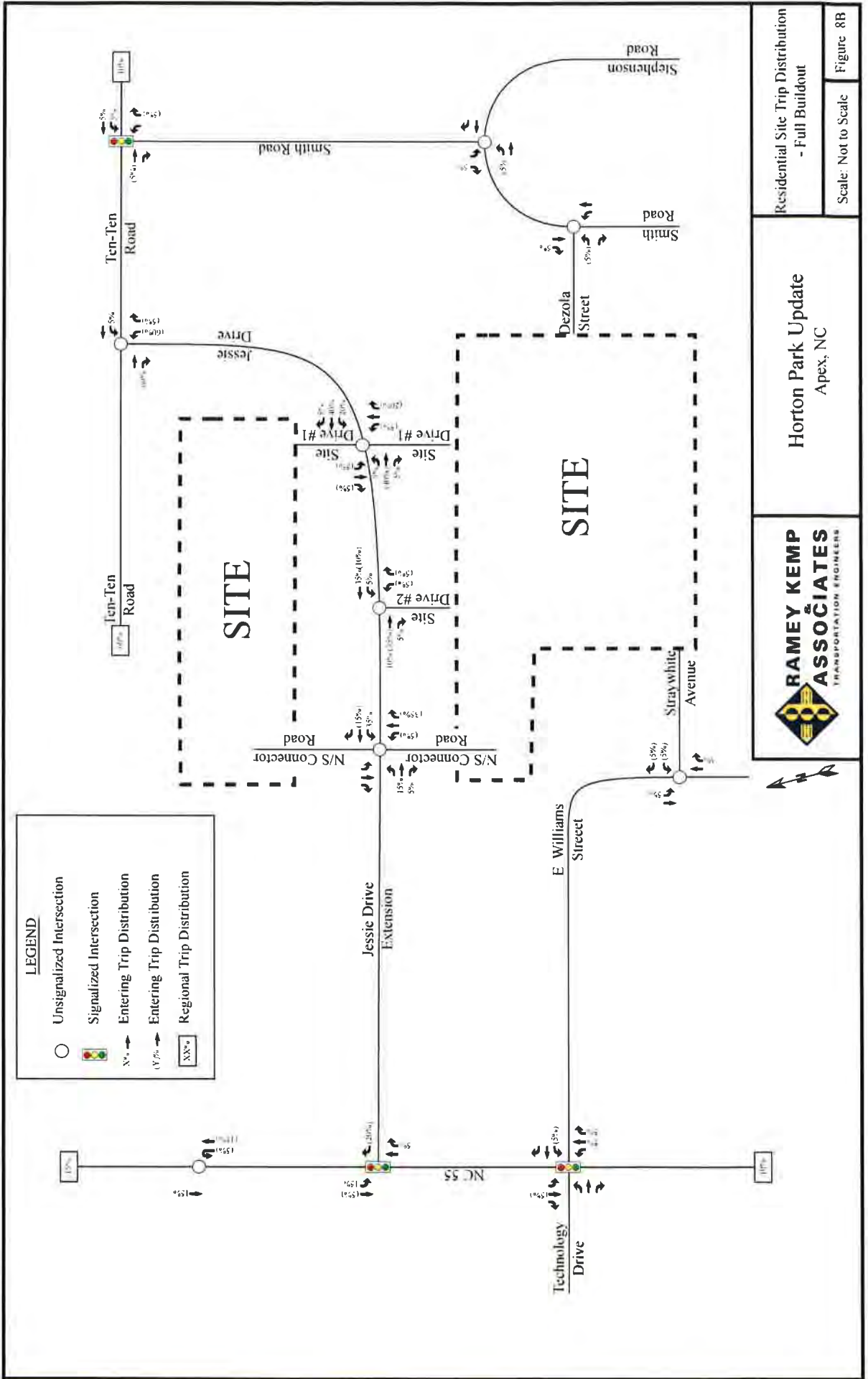


Residential Site Trip Distribution  
- Phase 1

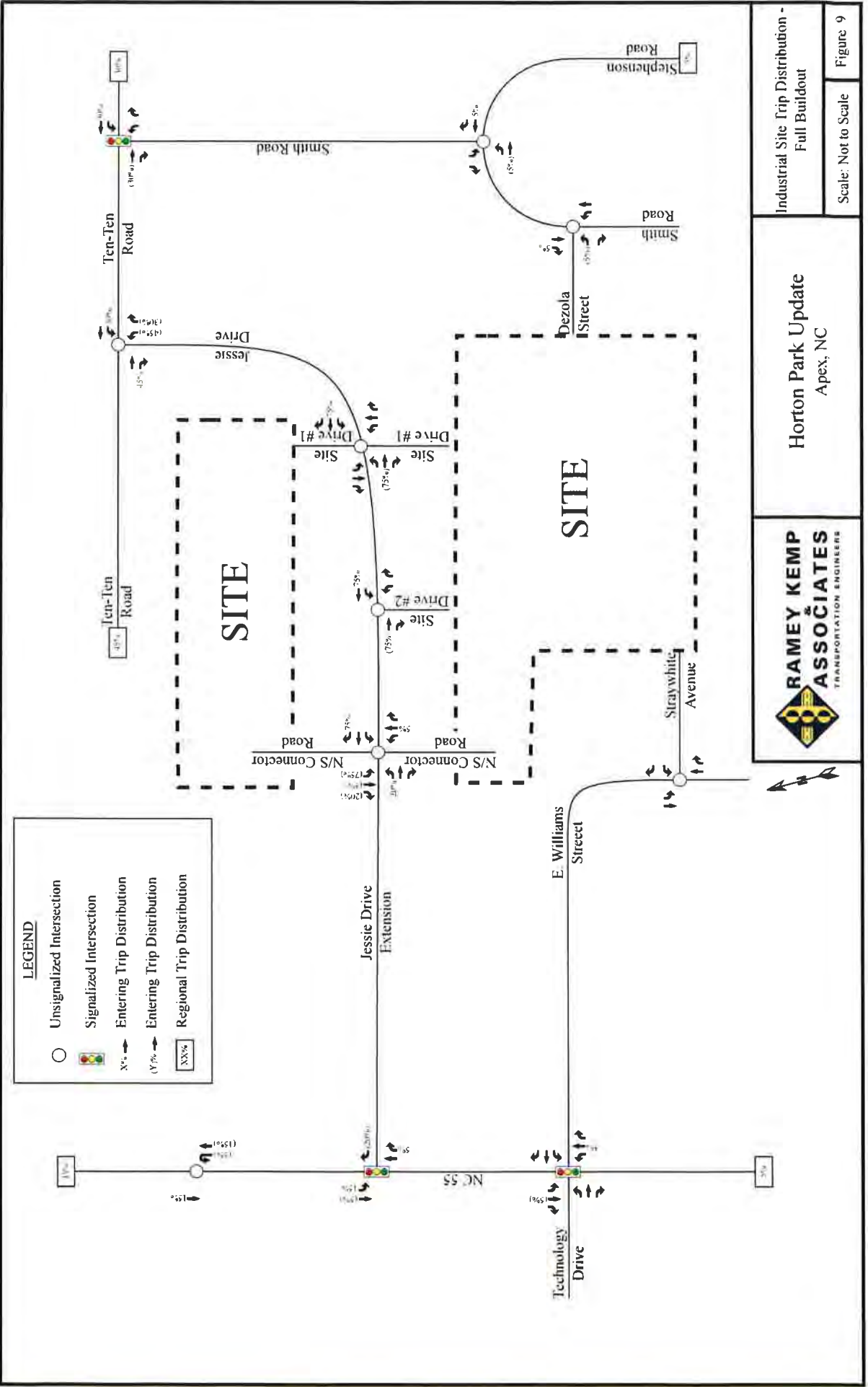
Horton Park Update  
Apex, NC



Scale: Not to Scale  
Figure 8A

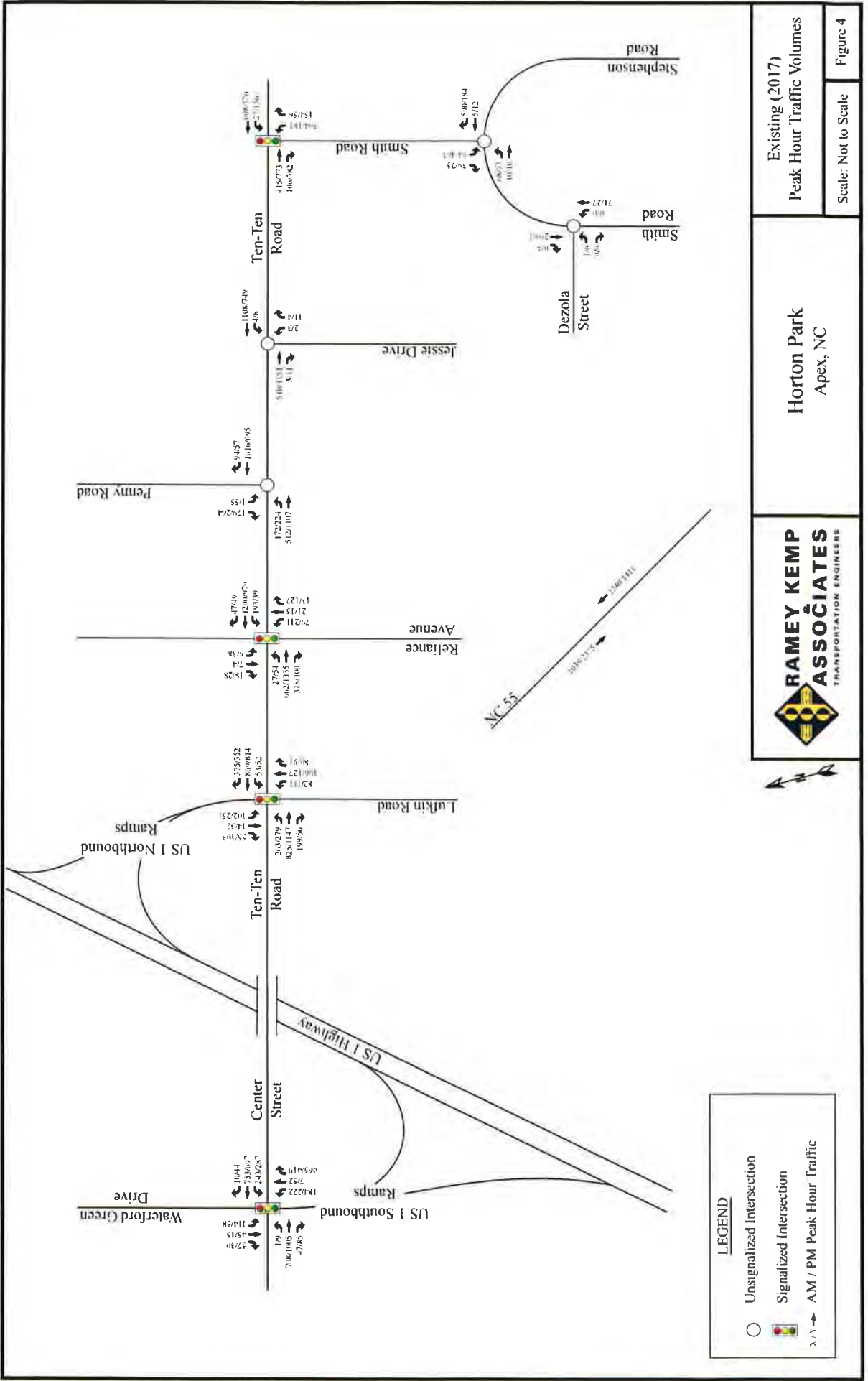


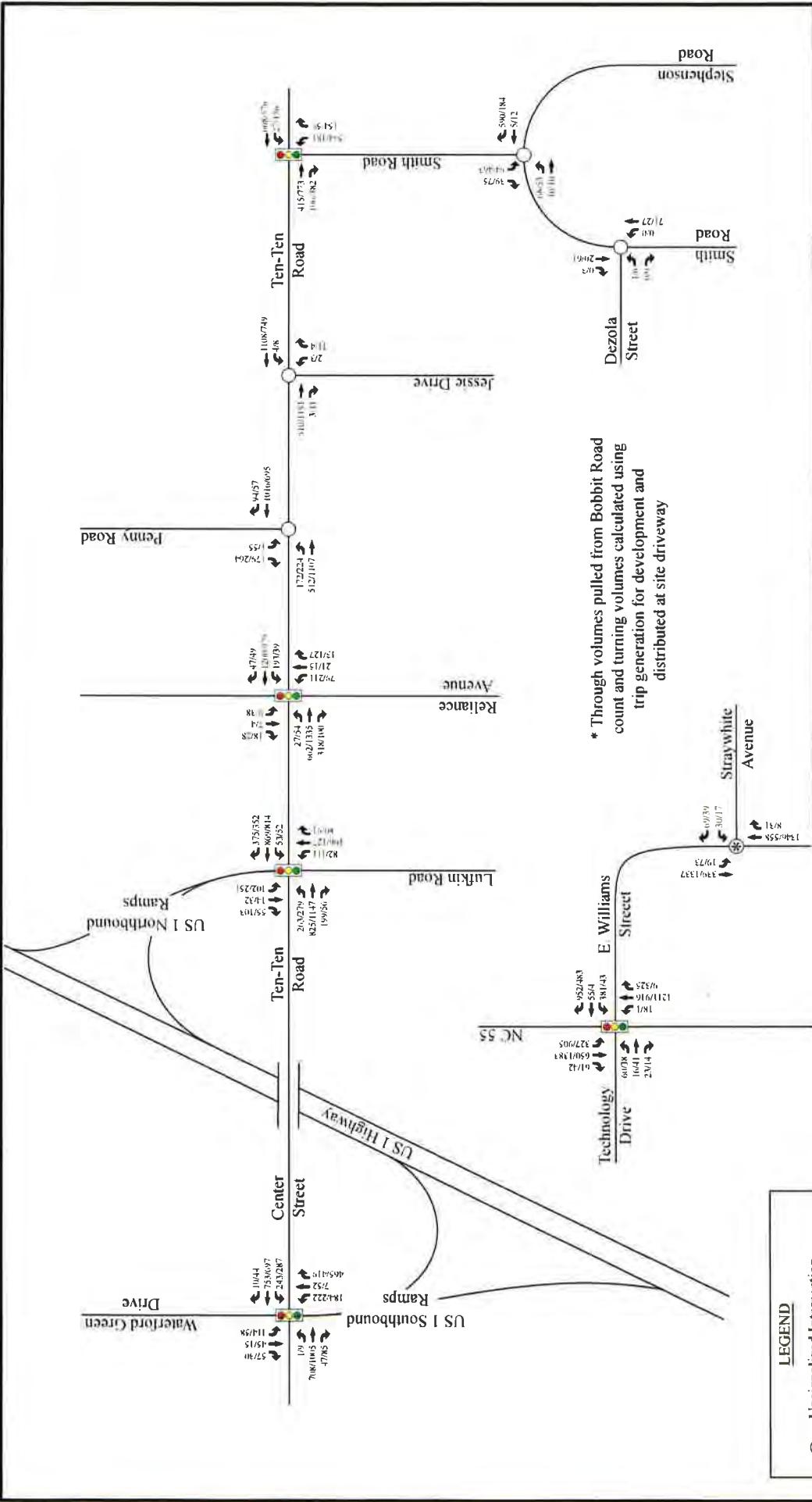




# **APPENDIX B**

## **TRAFFIC COUNTS**





\* Through volumes pulled from Bobbit Road count and turning volumes calculated using trip generation for development and distributed at site driveway

**LEGEND**

- Unsignalized Intersection
- ◫ Signalized Intersection
- x/y AM / PM Peak Hour Traffic

**RAMEY KEMP ASSOCIATES**  
TRANSPORTATION ENGINEERS

**Horton Park Addendum**  
Apex, NC

Existing (2017)  
Peak Hour Traffic Volumes

Scale: Not to Scale

Figure 4



# RAMEY KEMP & ASSOCIATES

TRANSPORTATION ENGINEERS

5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
PH: 919 872-5115  
FX: 919 878-5416

File Name : 8 Smith rd @ Dezola St  
Site Code : 00000008  
Start Date : 5/3/2017  
Page No : 1

Groups Printed- Cars & - Trucks & - Semis

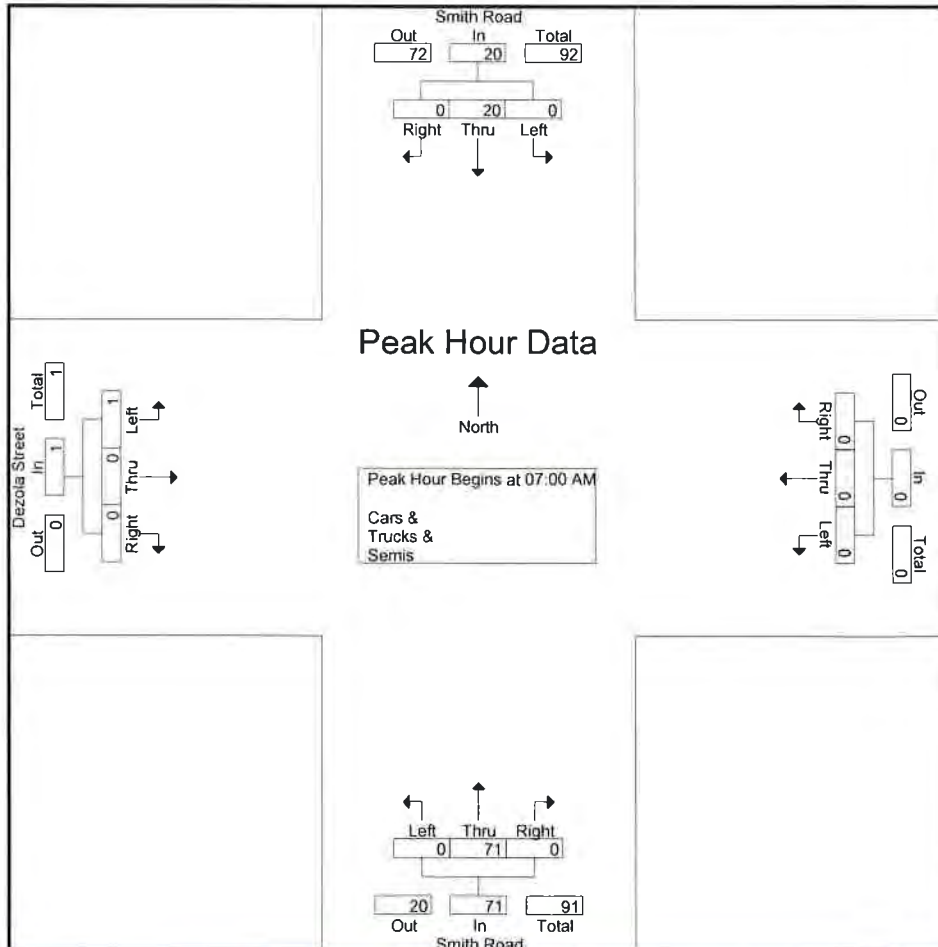
Start Time	Smith Road Southbound				Westbound				Smith Road Northbound				Dezola Street Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
07:00 AM	0	2	0	2	0	0	0	0	0	24	0	24	0	0	1	1	27
07:15 AM	0	5	0	5	0	0	0	0	0	17	0	17	0	0	0	0	22
07:30 AM	0	6	0	6	0	0	0	0	0	22	0	22	0	0	0	0	28
07:45 AM	0	7	0	7	0	0	0	0	0	8	0	8	0	0	0	0	15
Total	0	20	0	20	0	0	0	0	0	71	0	71	0	0	1	1	92
08:00 AM	0	6	0	6	0	0	0	0	0	15	0	15	0	0	0	0	21
08:15 AM	0	5	0	5	0	0	0	0	0	20	0	20	0	0	0	0	25
08:30 AM	0	5	0	5	0	0	0	0	0	14	0	14	0	0	0	0	19
08:45 AM	0	6	0	6	0	0	0	0	0	14	0	14	0	0	0	0	20
Total	0	22	0	22	0	0	0	0	0	63	0	63	0	0	0	0	85
***BREAK***																	
04:00 PM	0	7	0	7	0	0	0	0	0	8	0	8	0	0	0	0	15
04:15 PM	0	20	0	20	0	0	0	0	0	7	0	7	0	0	0	0	27
04:30 PM	1	16	0	17	0	0	0	0	0	9	0	9	0	0	6	6	32
04:45 PM	2	15	0	17	0	0	0	0	0	5	0	5	0	0	0	0	22
Total	3	58	0	61	0	0	0	0	0	29	0	29	0	0	6	6	96
05:00 PM	0	10	0	10	0	0	0	0	0	6	0	6	0	0	0	0	16
05:15 PM	0	9	0	9	0	0	0	0	0	7	0	7	0	0	0	0	16
05:30 PM	0	10	0	10	0	0	0	0	0	11	0	11	0	0	1	1	22
05:45 PM	1	7	0	8	0	0	0	0	0	12	0	12	0	0	0	0	20
Total	1	36	0	37	0	0	0	0	0	36	0	36	0	0	1	1	74
Grand Total	4	136	0	140	0	0	0	0	0	199	0	199	0	0	8	8	347
Apprch %	2.9	97.1	0		0	0	0		0	100	0		0	0	100		
Total %	1.2	39.2	0	40.3	0	0	0	0	0	57.3	0	57.3	0	0	2.3	2.3	
Cars &	4	121	0	125	0	0	0	0	0	185	0	185	0	0	8	8	318
% Cars &	100	89	0	89.3	0	0	0	0	0	93	0	93	0	0	100	100	91.6
Trucks &	0	14	0	14	0	0	0	0	0	13	0	13	0	0	0	0	27
% Trucks &	0	10.3	0	10	0	0	0	0	0	6.5	0	6.5	0	0	0	0	7.8
Semis	0	1	0	1	0	0	0	0	0	1	0	1	0	0	0	0	2
% Semis	0	0.7	0	0.7	0	0	0	0	0	0.5	0	0.5	0	0	0	0	0.6



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File Name : 8 Smith rd @ Dezola St  
 Site Code : 00000008  
 Start Date : 5/3/2017  
 Page No : 2

Start Time	Smith Road Southbound				Westbound				Smith Road Northbound				Dezola Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	27
07:15 AM	0	5	0	5	0	0	0	0	0	17	0	17	0	0	0	0	22
07:30 AM	0	6	0	6	0	0	0	0	0	22	0	22	0	0	0	0	28
07:45 AM	0	7	0	7	0	0	0	0	0	8	0	8	0	0	0	0	15
Total Volume	0	20	0	20	0	0	0	0	0	71	0	71	0	0	1	1	92
% App. Total	0	100	0		0	0	0		0	100	0		0	0	100		
PHF	.000	.714	.000	.714	.000	.000	.000	.000	.000	.740	.000	.740	.000	.000	.250	.250	.821

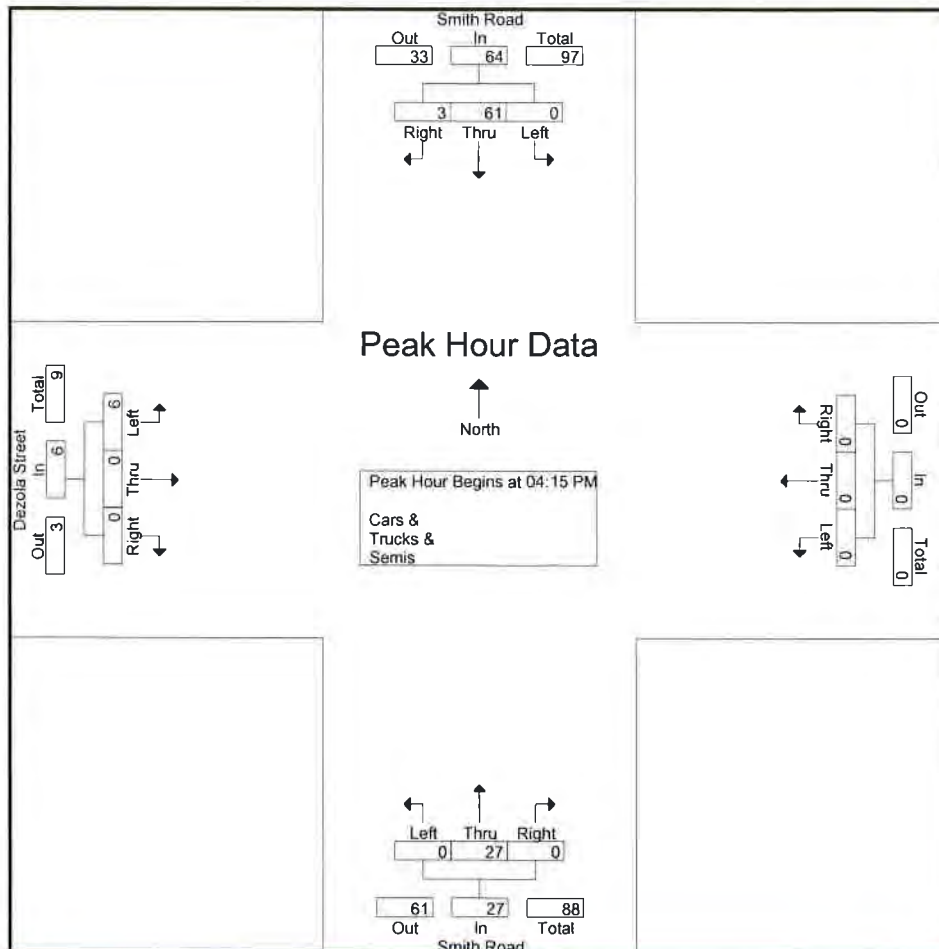




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File Name : 8 Smith rd @ Dezola St  
 Site Code : 00000008  
 Start Date : 5/3/2017  
 Page No : 3

Start Time	Smith Road Southbound				Westbound				Smith Road Northbound				Dezola Street Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	0	0	0	0	0	7	0	7	0	0	0	0	27
04:30 PM	1	16	0	17	0	0	0	0	0	0	0	0	0	0	6	6	32
04:45 PM	2	15	0	17	0	0	0	0	0	5	0	5	0	0	0	0	22
05:00 PM	0	10	0	10	0	0	0	0	0	6	0	6	0	0	0	0	16
Total Volume	3	61	0	64	0	0	0	0	0	27	0	27	0	0	6	6	97
% App. Total	4.7	95.3	0		0	0	0		0	100	0		0	0	100		
PHF	.375	.763	.000	.800	.000	.000	.000	.000	.000	.750	.000	.750	.000	.000	.250	.250	.758





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 FX: 919 878-5416

File Name : 7 Smith rd @ Stepenson  
 Site Code : 00000007  
 Start Date : 5/3/2017  
 Page No : 1

Groups Printed- Cars & - Trucks & - Semis

Start Time	Smith Road Southbound				Stephenson Road Westbound				Northbound				Stephenson Road Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
07:00 AM	6	0	14	20	152	1	0	153	0	0	0	0	0	3	15	18	191
07:15 AM	7	0	17	24	169	0	0	169	0	0	0	0	0	3	20	23	216
07:30 AM	10	0	19	29	157	0	0	157	0	0	0	0	0	3	12	15	201
07:45 AM	9	0	28	37	112	4	0	116	0	0	0	0	0	1	21	22	175
Total	32	0	78	110	590	5	0	595	0	0	0	0	0	10	68	78	783
08:00 AM	12	0	41	53	100	1	0	101	0	0	0	0	0	3	22	25	179
08:15 AM	11	0	29	40	92	4	0	96	0	0	0	0	0	4	27	31	167
08:30 AM	12	0	32	44	124	2	0	126	0	0	0	0	0	7	18	25	195
08:45 AM	6	0	28	34	135	4	0	139	0	0	0	0	0	5	25	30	203
Total	41	0	130	171	451	11	0	462	0	0	0	0	0	19	92	111	744
***BREAK***																	
04:00 PM	12	0	98	110	41	5	0	46	0	0	0	0	0	5	11	16	172
04:15 PM	23	0	90	113	35	8	0	43	0	0	0	0	0	3	21	24	180
04:30 PM	19	0	98	117	58	2	0	60	0	0	0	0	0	3	11	14	191
04:45 PM	19	0	107	126	38	4	0	42	0	0	0	0	0	6	11	17	185
Total	73	0	393	466	172	19	0	191	0	0	0	0	0	17	54	71	728
05:00 PM	18	0	101	119	37	0	0	37	0	0	0	0	0	2	9	11	167
05:15 PM	18	0	132	150	41	1	0	42	0	0	0	0	0	0	16	16	208
05:30 PM	20	0	123	143	56	7	0	63	0	0	0	0	0	2	17	19	225
05:45 PM	9	0	87	96	48	4	0	52	0	0	0	0	0	5	19	24	172
Total	65	0	443	508	182	12	0	194	0	0	0	0	0	9	61	70	772
Grand Total	211	0	1044	1255	1395	47	0	1442	0	0	0	0	0	55	275	330	3027
Apprch %	16.8	0	83.2		96.7	3.3	0		0	0	0		0	16.7	83.3		
Total %	7	0	34.5	41.5	46.1	1.6	0	47.6	0	0	0	0	0	1.8	9.1	10.9	
Cars &	196	0	1039	1235	1384	42	0	1426	0	0	0	0	0	47	261	308	2969
% Cars &	92.9	0	99.5	98.4	99.2	89.4	0	98.9	0	0	0	0	0	85.5	94.9	93.3	98.1
Trucks &	14	0	4	18	7	5	0	12	0	0	0	0	0	8	12	20	50
% Trucks &	6.6	0	0.4	1.4	0.5	10.6	0	0.8	0	0	0	0	0	14.5	4.4	6.1	1.7
Semis	1	0	1	2	4	0	0	4	0	0	0	0	0	0	2	2	8
% Semis	0.5	0	0.1	0.2	0.3	0	0	0.3	0	0	0	0	0	0	0.7	0.6	0.3

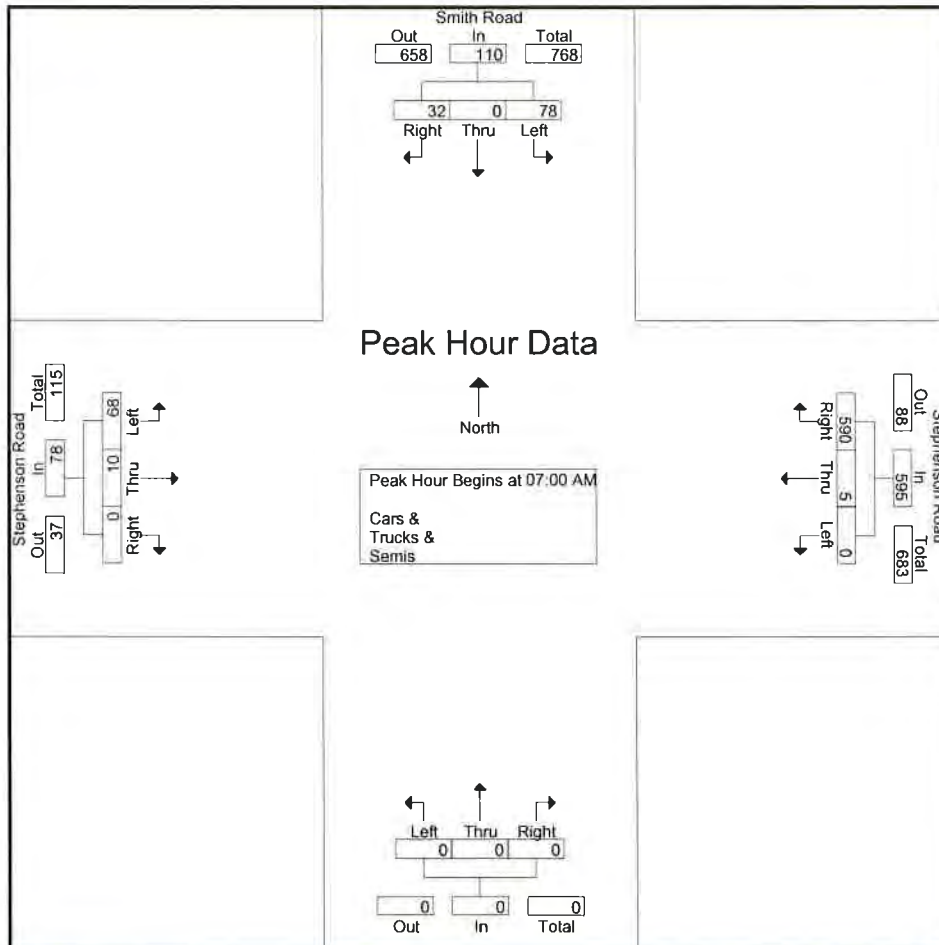




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 FX: 919 878-5416

File Name : 7 Smith rd @ Stepenson  
 Site Code : 00000007  
 Start Date : 5/3/2017  
 Page No : 2

Start Time	Smith Road Southbound				Stephenson Road Westbound				Northbound				Stephenson Road Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	6	0	14	20	152	1	0	153	0	0	0	0	0	3	15	18	191
07:15 AM	7	0	17	24	157	0	0	157	0	0	0	0	0	3	20	23	216
07:30 AM	10	0	19	29	157	0	0	157	0	0	0	0	0	3	12	15	201
07:45 AM	9	0	28	37	112	4	0	116	0	0	0	0	0	1	21	22	175
Total Volume	32	0	78	110	590	5	0	595	0	0	0	0	0	10	68	78	783
% App. Total	29.1	0	70.9		99.2	0.8	0		0	0	0		0	12.8	87.2		
PHF	.800	.000	.696	.743	.873	.313	.000	.880	.000	.000	.000	.000	.000	.833	.810	.848	.906

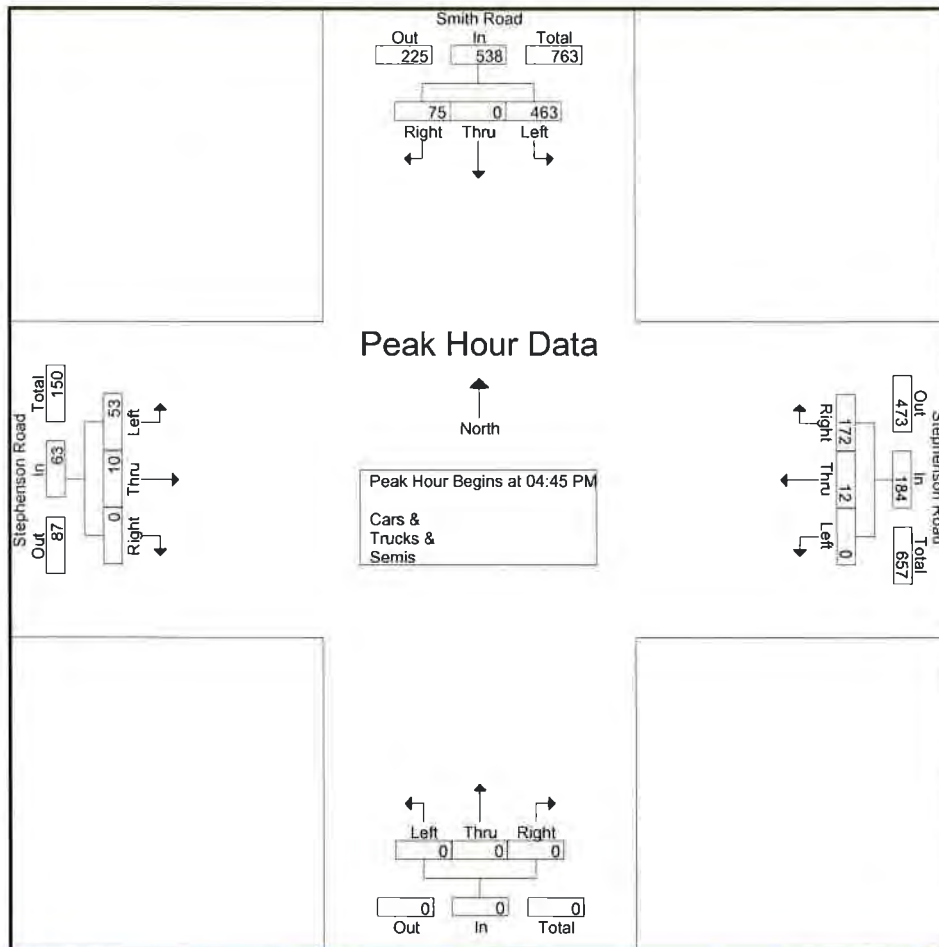




5808 Faringdon Place, Suite 100  
 Raleigh, NC 27609  
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 FX: 919 878-5416

File Name : 7 Smith rd @ Stepenson  
 Site Code : 00000007  
 Start Date : 5/3/2017  
 Page No : 3

Start Time	Smith Road Southbound				Stephenson Road Westbound				Northbound				Stephenson Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	19	0	107	126	38	4	0	42	0	0	0	0	0	0	11	17	185
05:00 PM	18	0	101	119	37	0	0	37	0	0	0	0	0	2	9	11	167
05:15 PM	18	0	132	150	41	1	0	42	0	0	0	0	0	0	16	16	208
05:30 PM	20	0	123	143	56	7	0	63	0	0	0	0	0	2	17	19	225
Total Volume	75	0	463	538	172	12	0	184	0	0	0	0	0	10	53	63	785
% App. Total	13.9	0	86.1		93.5	6.5	0		0	0	0		0	15.9	84.1		
PHF	.938	.000	.877	.897	.768	.429	.000	.730	.000	.000	.000	.000	.000	.417	.779	.829	.872





# RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS

5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
PH: 919 872-5115  
FX: 919 878-5416

File Name : 5 Ten Ten @ Jessie  
Site Code : 00000005  
Start Date : 5/3/2017  
Page No : 1

Groups Printed- Cars & - Trucks & - Semis

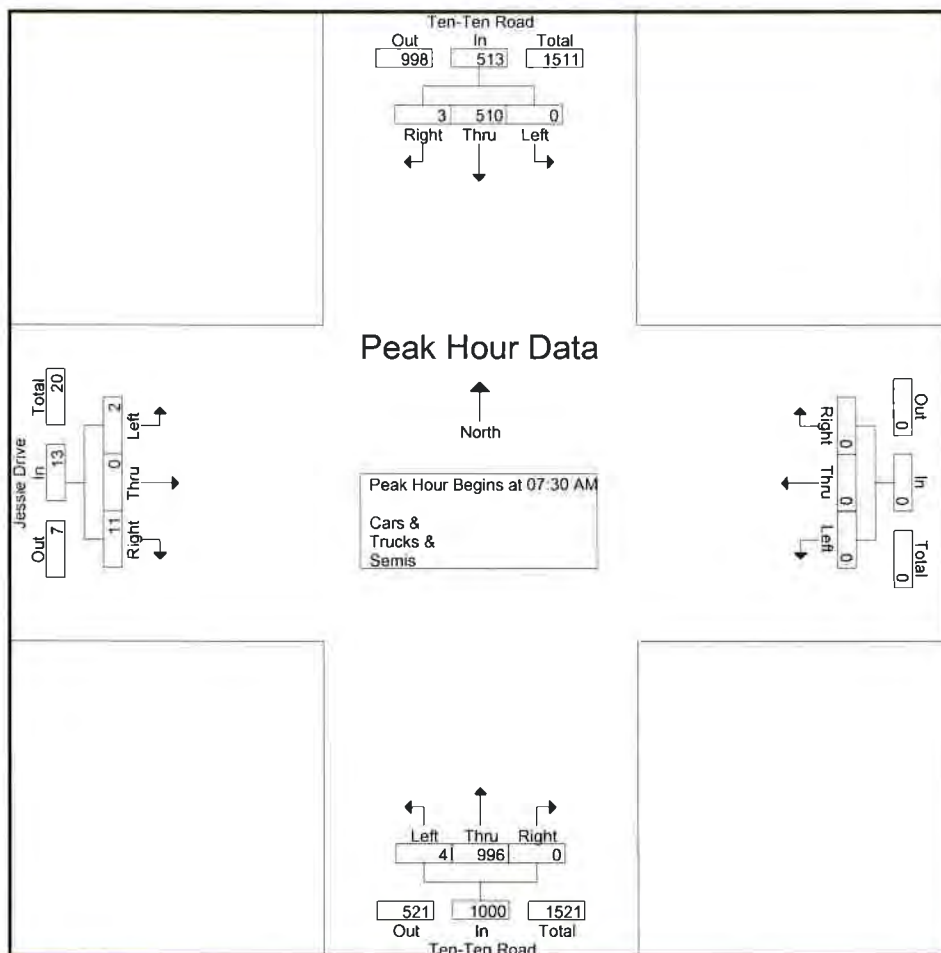
Start Time	Ten-Ten Road Southbound				Westbound				Ten-Ten Road Northbound				Jessie Drive Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
07:00 AM	1	69	0	70	0	0	0	0	0	334	2	336	2	0	3	5	411
07:15 AM	0	101	0	101	0	0	0	0	0	286	0	286	1	0	0	1	388
07:30 AM	1	107	0	108	0	0	0	0	0	254	2	256	4	0	0	4	368
07:45 AM	1	111	0	112	0	0	0	0	0	272	2	274	4	0	2	6	392
Total	3	388	0	391	0	0	0	0	0	1146	6	1152	11	0	5	16	1559
08:00 AM	1	138	0	139	0	0	0	0	0	238	0	238	0	0	0	0	377
08:15 AM	0	154	0	154	0	0	0	0	0	232	0	232	3	0	0	3	389
08:30 AM	1	137	0	138	0	0	0	0	0	272	0	272	0	0	3	3	413
08:45 AM	0	141	0	141	0	0	0	0	0	278	0	278	1	0	3	4	423
Total	2	570	0	572	0	0	0	0	0	1020	0	1020	4	0	6	10	1602
***BREAK***																	
04:00 PM	6	288	0	294	0	0	0	0	0	148	1	149	0	0	1	1	444
04:15 PM	1	269	0	270	0	0	0	0	0	138	2	140	1	0	0	1	411
04:30 PM	1	231	0	232	0	0	0	0	0	179	2	181	3	0	0	3	416
04:45 PM	5	277	0	282	0	0	0	0	0	151	1	152	1	0	3	4	438
Total	13	1065	0	1078	0	0	0	0	0	616	6	622	5	0	4	9	1709
05:00 PM	0	284	0	284	0	0	0	0	0	177	1	178	1	0	1	2	464
05:15 PM	5	284	0	289	0	0	0	0	0	148	4	152	0	0	2	2	443
05:30 PM	3	240	0	243	0	0	0	0	0	193	2	195	2	0	0	2	440
05:45 PM	3	237	0	240	0	0	0	0	0	200	1	201	1	0	0	1	442
Total	11	1045	0	1056	0	0	0	0	0	718	8	726	4	0	3	7	1789
Grand Total	29	3068	0	3097	0	0	0	0	0	3500	20	3520	24	0	18	42	6659
Apprch %	0.9	99.1	0		0	0	0		0	99.4	0.6		57.1	0	42.9		
Total %	0.4	46.1	0	46.5	0	0	0	0	0	52.6	0.3	52.9	0.4	0	0.3	0.6	
Cars &	28	2962	0	2990	0	0	0	0	0	3392	19	3411	24	0	17	41	6442
% Cars &	96.6	96.5	0	96.5	0	0	0	0	0	96.9	95	96.9	100	0	94.4	97.6	96.7
Trucks &	0	95	0	95	0	0	0	0	0	93	1	94	0	0	1	1	190
% Trucks &	0	3.1	0	3.1	0	0	0	0	0	2.7	5	2.7	0	0	5.6	2.4	2.9
Semis	1	11	0	12	0	0	0	0	0	15	0	15	0	0	0	0	27
% Semis	3.4	0.4	0	0.4	0	0	0	0	0	0.4	0	0.4	0	0	0	0	0.4



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 PH: 919 872-5115  
 FX: 919 878-5416

File Name : 5 Ten Ten @ Jessie  
 Site Code : 00000005  
 Start Date : 5/3/2017  
 Page No : 2

Start Time	Ten-Ten Road Southbound				Westbound				Ten-Ten Road Northbound				Jessie Drive Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:15 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	1	107	0	108	0	0	0	0	0	254	2	256	4	0	0	4	368
07:45 AM	1	111	0	112	0	0	0	0	0	274	2	274	4	0	2	6	392
08:00 AM	1	138	0	139	0	0	0	0	0	238	0	238	0	0	0	0	377
08:15 AM	0	154	0	154	0	0	0	0	0	232	0	232	3	0	0	3	389
Total Volume	3	510	0	513	0	0	0	0	0	996	4	1000	11	0	2	13	1526
% App. Total	0.6	99.4	0		0	0	0		0	99.6	0.4		84.6	0	15.4		
PHF	750	828	000	833	000	000	000	000	000	915	500	912	688	000	250	542	973





5808 Faringdon Place, Suite 100  
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 PH: 919 872-5115  
 FX: 919 878-5416

File Name : 5 Ten Ten @ Jessie  
 Site Code : 00000005  
 Start Date : 5/3/2017  
 Page No : 3

Start Time	Ten-Ten Road Southbound				Westbound				Ten-Ten Road Northbound				Jessie Drive Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	284	0	284	0	0	0	0	0	177	1	178	1	0	1	2	
05:15 PM	3	284	0	289	0	0	0	0	0	148	4	152	0	0	2	2	
05:30 PM	3	240	0	243	0	0	0	0	0	193	2	195	2	0	0	2	
05:45 PM	3	237	0	240	0	0	0	0	0	200	1	201	1	0	0	1	
Total Volume	11	1045	0	1056	0	0	0	0	0	718	8	726	4	0	3	7	
% App. Total	1	99	0		0	0	0		0	98.9	1.1		57.1	0	42.9		
PHF	.550	.920	.000	.913	.000	.000	.000	.000	.000	.898	.500	.903	.500	.000	.375	.875	



5808 Faringdon Place, Suite 100  
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 PH: 919 872-5115  
 FX: 919 878-5416

File Name : 6 Ten Ten @ Smith  
 Site Code : 00000006  
 Start Date : 5/3/2017  
 Page No : 1

Groups Printed- Cars & - Trucks & - Semis

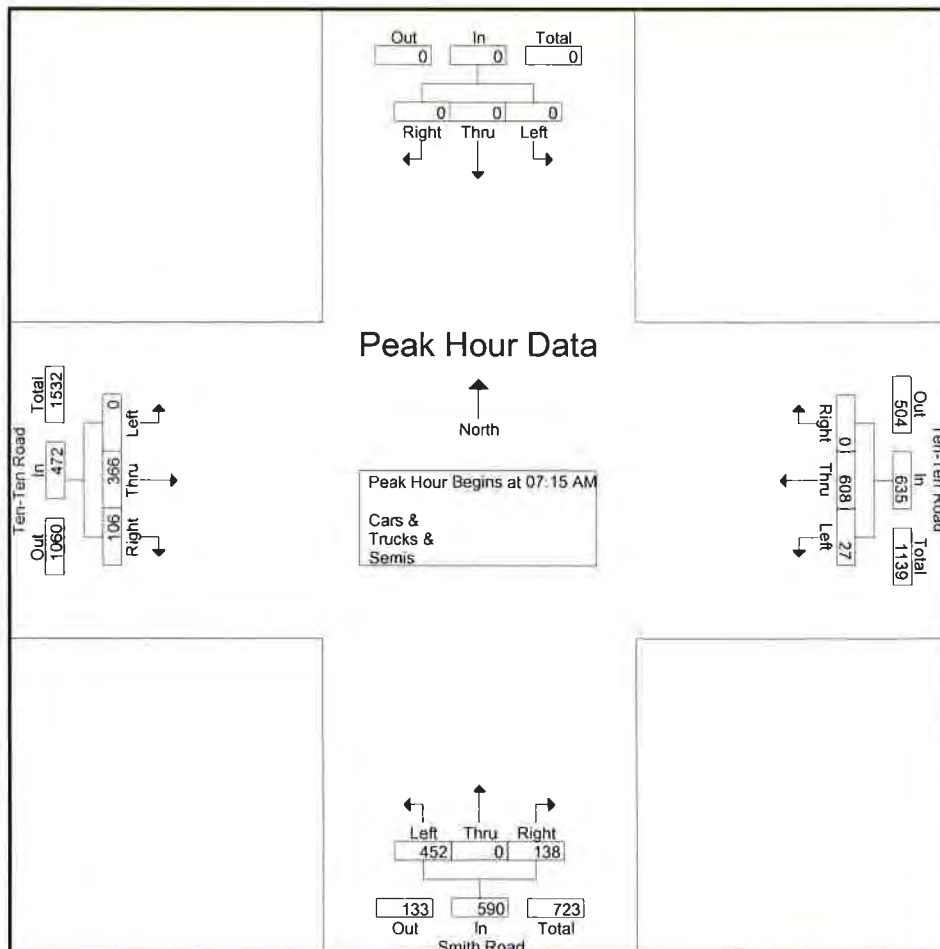
Start Time	Southbound				Ten-Ten Road Westbound				Smith Road Northbound				Ten-Ten Road Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
07:00 AM	0	0	0	0	0	211	3	214	22	0	135	157	11	58	0	69	440
07:15 AM	0	0	0	0	0	165	6	171	42	0	128	170	20	81	0	101	442
07:30 AM	0	0	0	0	0	156	5	161	43	0	127	170	22	95	0	117	448
07:45 AM	0	0	0	0	0	157	7	164	30	0	93	123	34	81	0	115	402
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>689</b>	<b>21</b>	<b>710</b>	<b>137</b>	<b>0</b>	<b>483</b>	<b>620</b>	<b>87</b>	<b>315</b>	<b>0</b>	<b>402</b>	<b>1732</b>
08:00 AM	0	0	0	0	0	130	9	139	23	0	104	127	30	109	0	139	405
08:15 AM	0	0	0	0	0	137	9	146	17	0	94	111	39	122	0	161	418
08:30 AM	0	0	0	0	0	141	7	148	27	0	101	128	19	125	0	144	420
08:45 AM	0	0	0	0	0	165	6	171	33	0	110	143	19	121	0	140	454
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>573</b>	<b>31</b>	<b>604</b>	<b>100</b>	<b>0</b>	<b>409</b>	<b>509</b>	<b>107</b>	<b>477</b>	<b>0</b>	<b>584</b>	<b>1697</b>
***BREAK***																	
04:00 PM	0	0	0	0	0	110	18	128	13	0	27	40	77	219	0	296	464
04:15 PM	0	0	0	0	0	101	20	121	23	0	36	59	95	173	0	268	448
04:30 PM	0	0	0	0	0	124	31	155	12	0	53	65	90	166	0	256	476
04:45 PM	0	0	0	0	0	107	28	135	13	0	34	47	92	186	0	278	460
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>442</b>	<b>97</b>	<b>539</b>	<b>61</b>	<b>0</b>	<b>150</b>	<b>211</b>	<b>354</b>	<b>744</b>	<b>0</b>	<b>1098</b>	<b>1848</b>
05:00 PM	0	0	0	0	0	136	28	164	10	0	41	51	100	201	0	301	516
05:15 PM	0	0	0	0	0	111	52	163	19	0	41	60	97	195	0	292	515
05:30 PM	0	0	0	0	0	149	41	190	20	0	48	68	91	202	0	293	551
05:45 PM	0	0	0	0	0	160	26	186	7	0	51	58	73	175	0	248	492
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>556</b>	<b>147</b>	<b>703</b>	<b>56</b>	<b>0</b>	<b>181</b>	<b>237</b>	<b>361</b>	<b>773</b>	<b>0</b>	<b>1134</b>	<b>2074</b>
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2260</b>	<b>296</b>	<b>2556</b>	<b>354</b>	<b>0</b>	<b>1223</b>	<b>1577</b>	<b>909</b>	<b>2309</b>	<b>0</b>	<b>3218</b>	<b>7351</b>
Apprch %	0	0	0	0	0	88.4	11.6		22.4	0	77.6		28.2	71.8	0		
Total %	0	0	0	0	0	30.7	4	34.8	4.8	0	16.6	21.5	12.4	31.4	0	43.8	
Cars &	0	0	0	0	0	2219	290	2509	342	0	1206	1548	888	2264	0	3152	7209
% Cars &	0	0	0	0	0	98.2	98	98.2	96.6	0	98.6	98.2	97.7	98.1	0	97.9	98.1
Trucks &	0	0	0	0	0	32	5	37	12	0	14	26	20	35	0	55	118
% Trucks &	0	0	0	0	0	1.4	1.7	1.4	3.4	0	1.1	1.6	2.2	1.5	0	1.7	1.6
Semis	0	0	0	0	0	9	1	10	0	0	3	3	1	10	0	11	24
% Semis	0	0	0	0	0	0.4	0.3	0.4	0	0	0.2	0.2	0.1	0.4	0	0.3	0.3



5808 Faringdon Place, Suite 100  
 Raleigh, NC 27609  
 PH: 919 872-5115  
 FX: 919 878-5416

File Name : 6 Ten Ten @ Smith  
 Site Code : 00000006  
 Start Date : 5/3/2017  
 Page No : 2

Start Time	Southbound				Ten-Ten Road Westbound				Smith Road Northbound				Ten-Ten Road Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:15 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	0	0	0	0	165	6	171	42	0	128	170	20	81	0	101	442
07:30 AM	0	0	0	0	0	156	5	161	43	0	127	170	22	95	0	117	448
07:45 AM	0	0	0	0	0	157	7	164	30	0	93	123	34	81	0	115	402
08:00 AM	0	0	0	0	0	130	9	139	23	0	104	127	30	109	0	139	405
Total Volume	0	0	0	0	0	608	27	635	138	0	452	590	106	366	0	472	1697
% App. Total	0	0	0	0	0	95.7	4.3		23.4	0	76.6		22.5	77.5	0		
PHF	.000	.000	.000	.000	.000	.921	.750	.928	.802	.000	.883	.868	.779	.839	.000	.849	.947



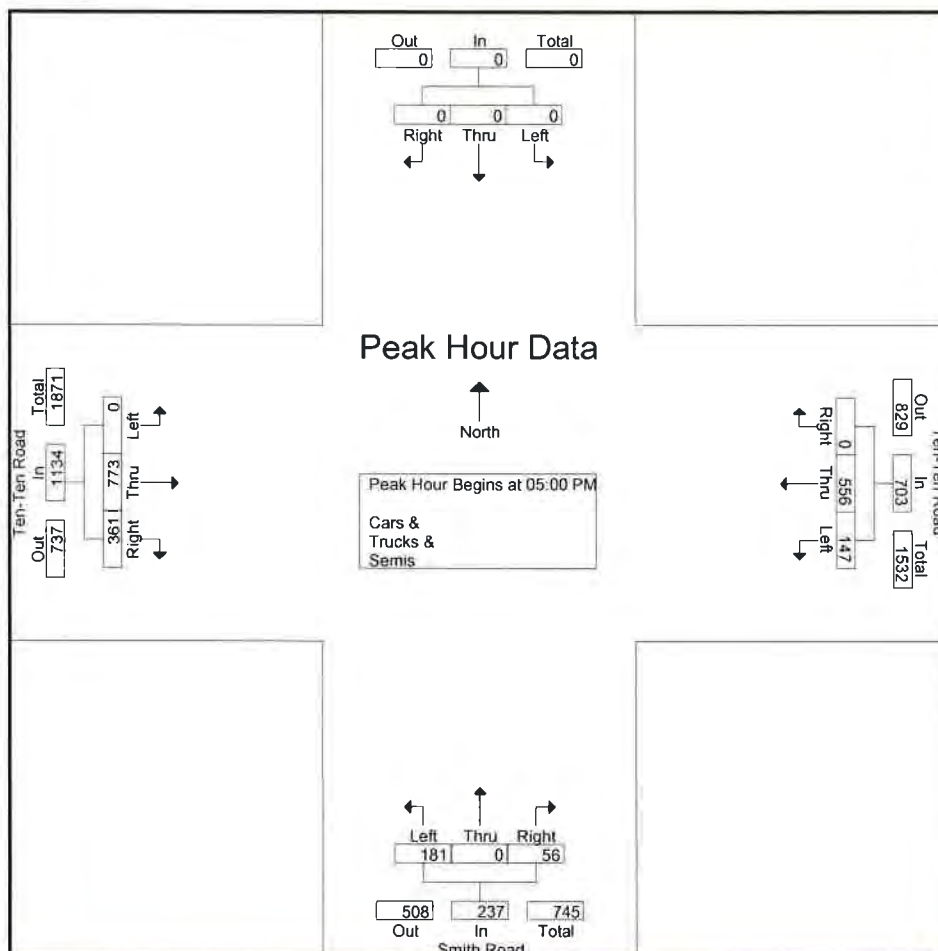


# RAMEY KEMP & ASSOCIATES TRANSPORTATION ENGINEERS

5808 Faringdon Place, Suite 100  
Raleigh, NC 27609  
PH: 919 872-5115  
FX: 919 878-5416

File Name : 6 Ten Ten @ Smith  
Site Code : 00000006  
Start Date : 5/3/2017  
Page No : 3

Start Time	Southbound				Ten-Ten Road Westbound				Smith Road Northbound				Ten-Ten Road Eastbound				Int. Total
	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	Right	Thru	Left	App Total	
Peak Hour Analysis From 04:45 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	0	0	0	0	0	136	28	164	10	0	41	51	100	201	0	301	516
05:15 PM	0	0	0	0	0	111	22	133	19	0	41	60	97	195	0	292	515
05:30 PM	0	0	0	0	0	149	41	190	20	0	48	68	91	202	0	293	551
05:45 PM	0	0	0	0	0	160	26	186	7	0	51	58	73	175	0	248	492
Total Volume	0	0	0	0	0	556	147	703	56	0	181	237	361	773	0	1134	2074
% App. Total	0	0	0	0	0	79.1	20.9		23.6	0	76.4		31.8	68.2	0		
PHF	.000	.000	.000	.000	.000	.869	.707	.925	.700	.000	.887	.871	.903	.957	.000	.942	.941





# **APPENDIX C**

## **SIGNAL PLANS**

5 Phase Fully Actuated (Isolated)

NOTES

1. Refer to "Roadway Standard Drawings NC001" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012. Do not program signal for late night finishing operation unless otherwise directed by Phasing Engineer.
2. Phase 1 color phase 5 may be lagged.
3. Set all detector units to presence mode.
4. Set all detector units to presence mode.
5. Pavement markings are existing unless otherwise shown.

2070L LOOP & DETECTOR INSTALLATION

LOOP	INDUCTIVE LAYOUT		DETECTOR PROGRAMMING			
	WAVELENGTH (ft)	NO. OF LAMPS	PHASE	CHANGES	INTERVAL (min)	STATUS (min)
1A	8450	0	2-4-2	1	1	1
1B	8450	0	2-4-2	1	1	1
2A	516	420	5	2	1	1
2B	516	420	5	2	1	1
4A	8450	0	2-4-2	4	1	1
4B	8450	0	2-4-2	4	1	1
5A	8450	0	2-4-2	5	1	1
5B	8450	0	2-4-2	5	1	1
6A	8450	400	5	6	1	1
6B	8450	400	5	6	1	1
8A	8450	0	2-4-2	8	1	1
8B	8450	0	2-4-2	8	1	1

SIGNAL FACE I.D.

ALL SIGNS 11'-0"

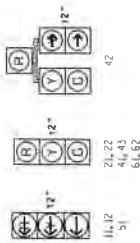
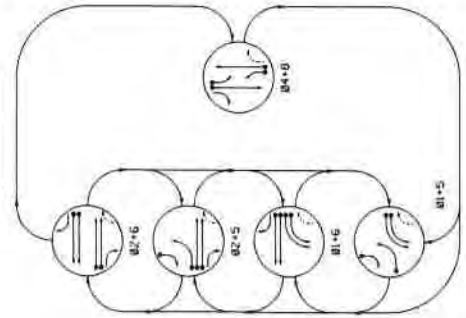


TABLE OF OPERATION

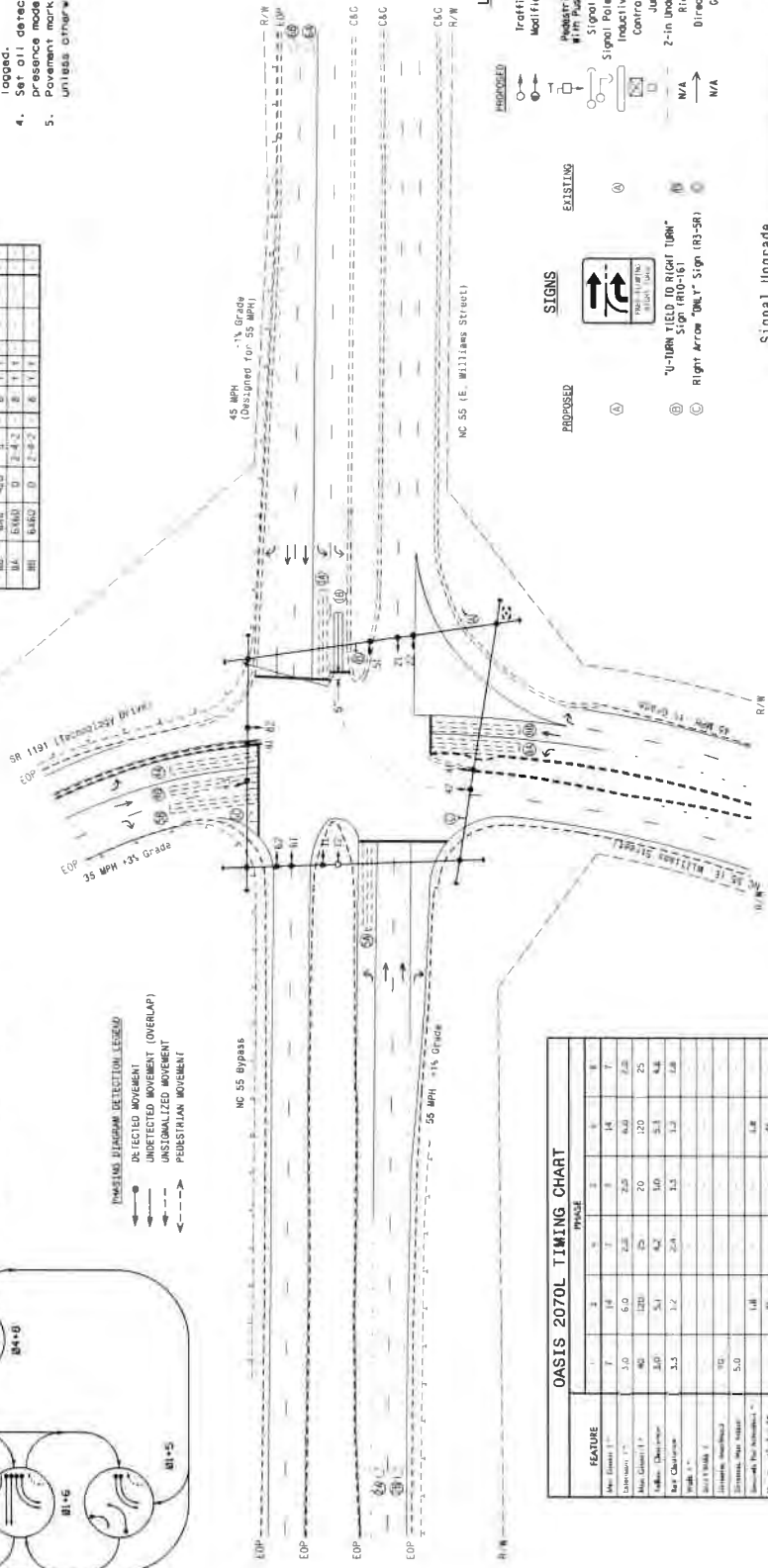
SIGNAL FACE	PHASE			
	1	2	3	4
1A, 1B	1	2	3	4
2A, 2B	1	2	3	4
4A, 4B	1	2	3	4
5A, 5B	1	2	3	4
6A, 6B	1	2	3	4
8A, 8B	1	2	3	4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- DETECTED MOVEMENT (OVERLAP)
- UNDETECTED MOVEMENT
- PRESIGNAL MOVEMENT



OASIS 2070L TIMING CHART

SEQUENCE	PHASE			
	1	2	3	4
Min. Interval 1"	1.0	6.0	2.5	1.8
Max. Green 1"	40	120	20	20
Yellow 1"	3.0	3.0	4.0	4.0
Red Clearance 1"	3.5	3.2	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
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Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
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Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
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Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
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Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
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Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow 1"	3.0	3.0	2.0	1.0
Start Green 1"	3.0	3.0	2.0	1.0
Start Red 1"	3.0	3.0	2.0	1.0
Start Yellow				

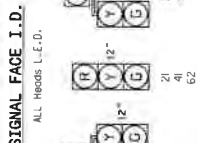
3 Phase Fully Actuated (Isolated)

**ONASIS 2070L LOOP & DETECTOR INSTALLATION CHART**

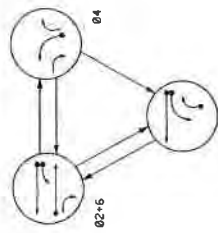
LOOP	INDUCTIVE LOOP	DETECTOR PROGRAMMING				ENTER TIME	EXIT TIME
		PHASE	TRIGGER	TRIGGER	TRIGGER		
1A	6X60	15	2-4-2	1	1	15	15
1B	6X60	15	2-4-2	1	1	15	15
2A	6X60	300	4	2	1	1.6	1.6
30	6X60	300	5	2	1	1.6	1.6
4L	6X60	300	5	2-4-2	1	1.6	1.6
4R	6X60	300	5	2-4-2	1	1.6	1.6
5L	6X60	300	5	2-4-2	1	1.6	1.6
5R	6X60	300	5	2-4-2	1	1.6	1.6

**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	0	1	2	3
21	R	L	Y	Y
41	R	L	Y	Y
61	R	L	Y	Y
81	R	L	Y	Y



**PHASING DIAGRAM**

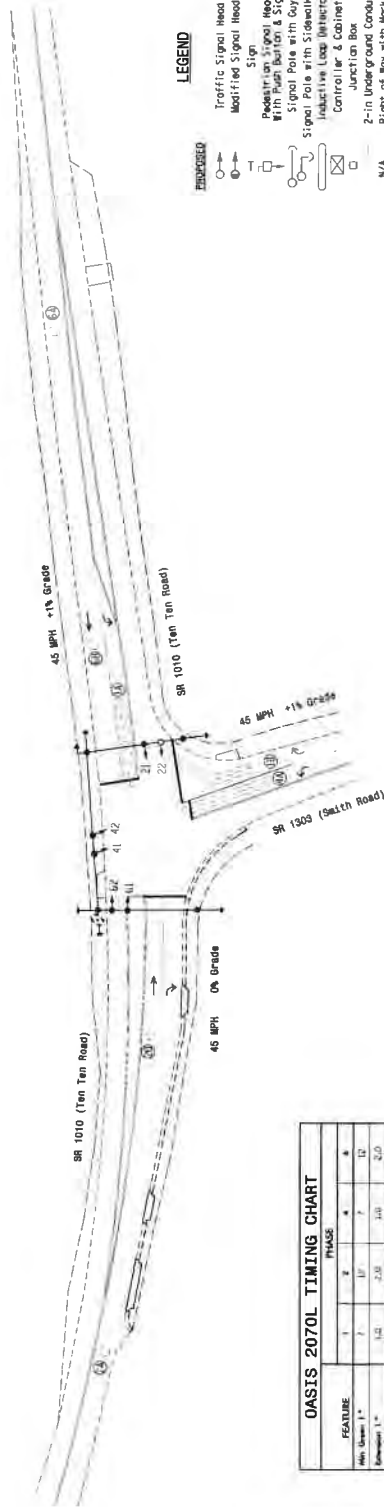


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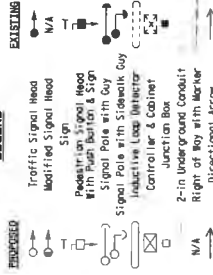


**NOTES**

- Refer to "Roadway Standard Drawings MCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Reposition existing signal head number 21.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ATIS and Signal Design Manual to submit a Plan of Record to the Signal Design Section.
- Pavement markings are existing.



**LEGEND**



**ONASIS 2070L TIMING CHART**

FEATURE	PHASE			
	1	2	3	4
Min Green 1"	7	17	7	12
Extension 1"	1.2	2.0	1.0	2.0
Max Green 1"	15	46	25	45
Yellow Clearance	3.0	4.5	3.0	4.4
Red Clearance	1.8	1.2	2.4	1.1
Red Burnt	2.0	2.0	2.0	2.0
Walk 1"	-	-	-	-
Clear Walk 1"	-	-	-	-
Minimum Per Activation *	-	-	-	-
Max Variable Interval *	-	-	-	-
Time Before Retraction *	-	-	-	-
Time To Indication *	-	-	-	-
Minimum Lead	-	-	-	-
Redall Walk	-	-	-	-
Vehicle Call Memory	-	-	-	-
Dual Entry	-	-	-	-
Simultaneous Ops	ON	ON	ON	ON
Min Recall	-	-	-	-
Yellow	-	-	-	-

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

**Signal Upgrade**



SR 1010 (Ten Ten Road) at SR 1303 (Smith Road)

Mark G. Smith  
 License No. 10000  
 State of Maryland



# **APPENDIX D**

## **ADJACENT DEVELOPMENT / BACKGROUND IMPROVEMENT INFORMATION**

# Empire Estates at Apex 55

## Traffic Impact Analysis

Apex, North Carolina

November 6, 2015



11/6/15

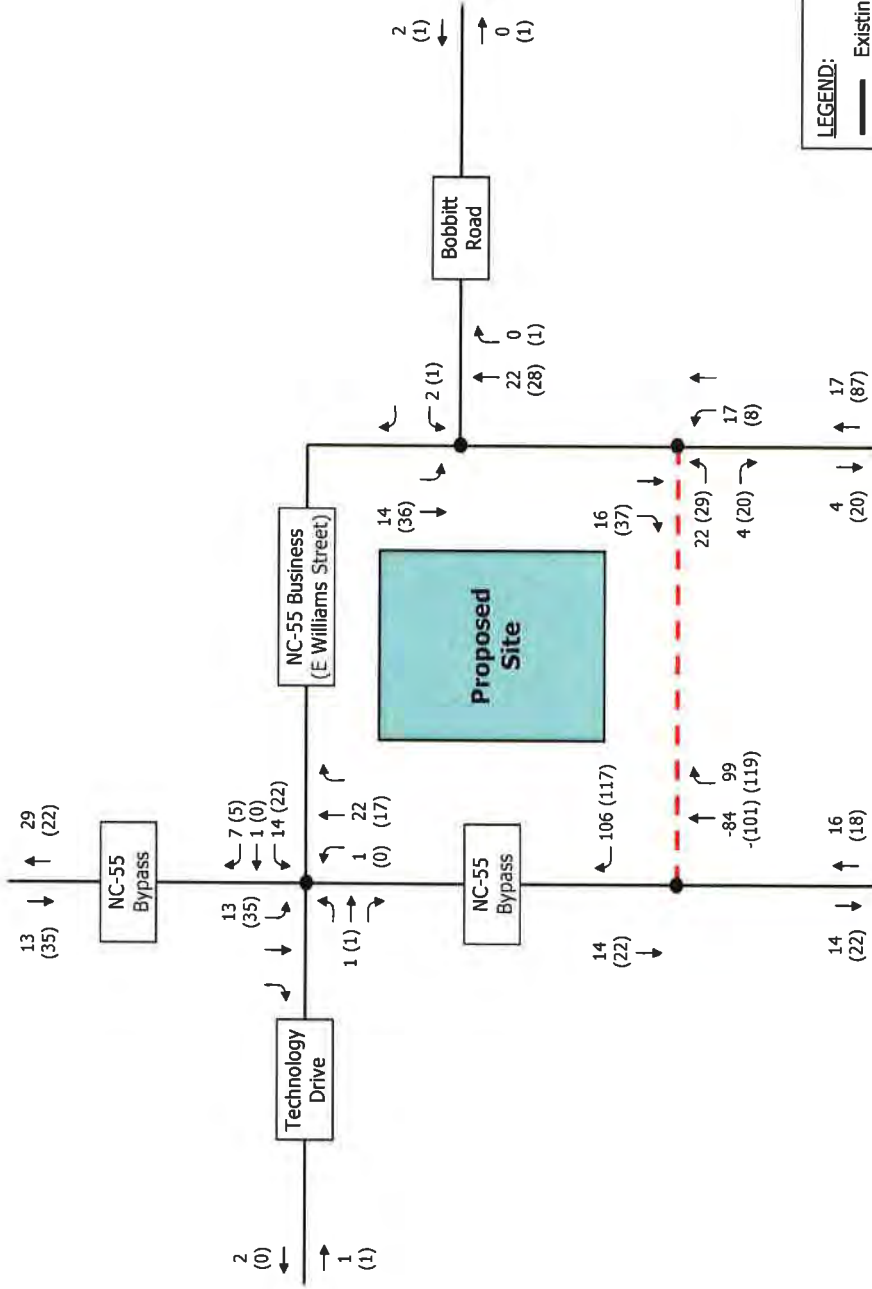
*Prepared for:*

**Empire Estate, LLC**

**TIMMONS GROUP**  
YOUR VISION ACHIEVED THROUGH OURS.

Contact: Jeff Hochanadel, PE

5410 Trinity Road, Suite 102 • Raleigh, NC 27607  
(919) 866-4951 phone • (919) 859-5663 fax  
[www.timmons.com](http://www.timmons.com)

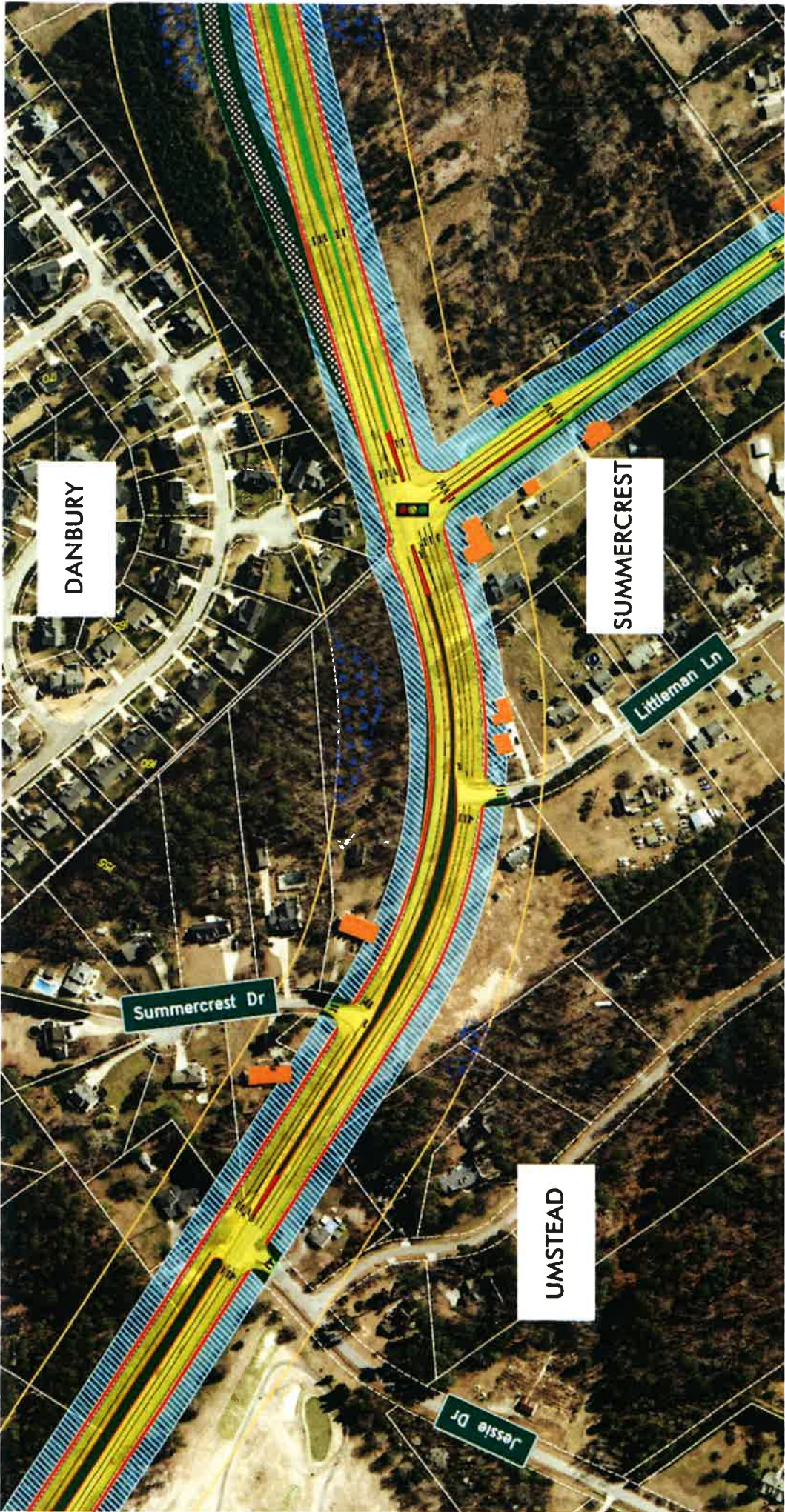


NOT TO SCALE



Empire Estates @ Apex 55 TIA  
2017 Total Trip Distribution Volumes

Figure  
4-4







# **APPENDIX E**

**CAPACITY ANALYSIS CALCULATIONS**

**TEN-TEN ROAD**

**&**

**SMITH ROAD**

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↙	↗
Traffic Volume (vph)	440	112	29	645	535	163
Future Volume (vph)	440	112	29	645	535	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100	150		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.183		0.950	
Satd. Flow (perm)	1863	1583	341	1863	1770	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	35	
Link Distance (ft)	1511			1269	1107	
Travel Time (s)	22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	489	124	32	717	594	181
Shared Lane Traffic (%)						
Lane Group Flow (vph)	489	124	32	717	594	181
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	0	1	2	1	1
Detector Template						
Leading Detector (ft)	306	0	65	306	65	65
Trailing Detector (ft)	90	0	5	90	5	5
Detector 1 Position(ft)	90	0	5	90	5	5
Detector 1 Size(ft)	6	20	60	6	60	60
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)	300			300		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	1.6			1.6		
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov
Protected Phases	2	4	1	6	4	1
Permitted Phases		2	6			4

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	4	1	6	4	1
Switch Phase						
Minimum Initial (s)	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	45.0	25.0	15.0	45.0	25.0	15.0
Total Split (%)	52.9%	29.4%	17.6%	52.9%	29.4%	17.6%
Maximum Green (s)	39.2	19.6	10.2	39.5	19.6	10.2
Yellow Time (s)	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	Min	None	None	Min	None	None
Act Effct Green (s)	20.9	46.1	32.8	32.8	20.2	32.1
Actuated g/C Ratio	0.33	0.73	0.52	0.52	0.32	0.51
v/c Ratio	0.79	0.11	0.10	0.74	1.05	0.22
Control Delay	29.0	2.5	7.4	16.9	78.0	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.0	2.5	7.4	16.9	78.0	11.3
LOS	C	A	A	B	E	B
Approach Delay	23.6			16.5	62.4	
Approach LOS	C			B	E	
Queue Length 50th (ft)	165	10	5	194	~255	36
Queue Length 95th (ft)	260	20	15	305	#526	92
Internal Link Dist (ft)	1431			1189	1027	
Turn Bay Length (ft)		100	150		100	
Base Capacity (vph)	1192	1157	406	1636	566	886
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.41	0.11	0.08	0.44	1.05	0.20

Intersection Summary

Area Type: Other  
 Cycle Length: 85  
 Actuated Cycle Length: 63.1  
 Natural Cycle: 75  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 35.2  
 Intersection Capacity Utilization 71.9%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Smith Road & Ten-Ten Road



1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↘	↗
Traffic Volume (vph)	820	405	166	611	192	59
Future Volume (vph)	820	405	166	611	192	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100	150		100	0
Storage Lanes		1	1		1	1
Taper Length (ft)			100		100	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	1863	1583	1770	1863	1770	1583
Flt Permitted			0.090		0.950	
Satd. Flow (perm)	1863	1583	168	1863	1770	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	35	
Link Distance (ft)	1511			1269	1107	
Travel Time (s)	22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	911	450	184	679	213	66
Shared Lane Traffic (%)						
Lane Group Flow (vph)	911	450	184	679	213	66
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	0	1	2	1	1
Detector Template						
Leading Detector (ft)	306	0	65	306	65	65
Trailing Detector (ft)	90	0	5	90	5	5
Detector 1 Position(ft)	90	0	5	90	5	5
Detector 1 Size(ft)	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)	300			300		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	1.6			1.6		
Turn Type	NA	pm+ov	pm+pt	NA	Prot	pm+ov
Protected Phases	2	4	1	6	4	1
Permitted Phases		2	6			4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

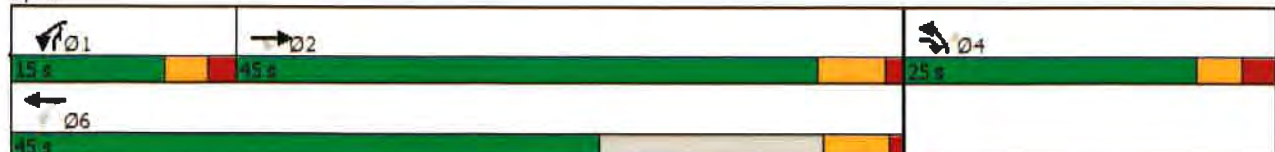
Existing (2019) PM  
06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	4	1	6	4	1
Switch Phase						
Minimum Initial (s)	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	45.0	25.0	15.0	45.0	25.0	15.0
Total Split (%)	52.9%	29.4%	17.6%	52.9%	29.4%	17.6%
Maximum Green (s)	39.2	19.6	10.2	39.5	19.6	10.2
Yellow Time (s)	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Vehicle Extension (s)	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	Min	None	None	Min	None	None
Act Effct Green (s)	40.2	58.0	53.0	53.0	12.8	25.7
Actuated g/C Ratio	0.53	0.76	0.70	0.70	0.17	0.34
v/c Ratio	0.92	0.37	0.65	0.52	0.71	0.12
Control Delay	35.2	4.0	23.0	7.9	43.4	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	4.0	23.0	7.9	43.4	17.2
LOS	D	A	C	A	D	B
Approach Delay	24.9		11.2		37.2	
Approach LOS	C		B		D	
Queue Length 50th (ft)	352	47	29	123	94	21
Queue Length 95th (ft)	#752	97	107	264	168	46
Internal Link Dist (ft)	1431		1189		1027	
Turn Bay Length (ft)	100		150		100	
Base Capacity (vph)	986	1361	329	1356	468	582
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.92	0.33	0.56	0.50	0.46	0.11

Intersection Summary















Area Type: Other  
 Cycle Length: 85  
 Actuated Cycle Length: 75.9  
 Natural Cycle: 80  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 21.5  
 Intersection Capacity Utilization 75.5%  
 Analysis Period (min) 15  
 Intersection LOS: C  
 ICU Level of Service D  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Smith Road & Ten-Ten Road



1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	510	130	34	748	620	189
Future Volume (vph)	4	510	130	34	748	620	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	567	144	38	831	689	210
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	567	144	38	831	689	210
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

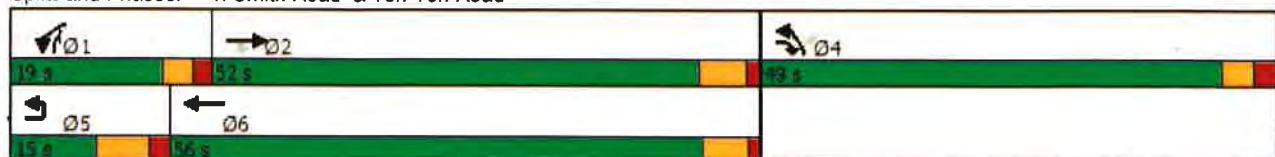
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.4	17.5	38.7	7.2	28.0	16.0	28.4
Actuated g/C Ratio	0.17	0.31	0.69	0.13	0.50	0.28	0.50
v/c Ratio	0.01	0.52	0.13	0.17	0.47	0.71	0.26
Control Delay	27.2	17.8	2.9	29.4	12.3	23.2	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.2	17.8	2.9	29.4	12.3	23.2	10.4
LOS	C	B	A	C	B	C	B
Approach Delay		14.9			13.0	20.2	
Approach LOS		B			B	C	
Queue Length 50th (ft)	1	75	12	10	74	92	31
Queue Length 95th (ft)	11	145	23	48	234	212	111
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	328	3057	1552	460	3202	2805	1007
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.19	0.09	0.08	0.26	0.25	0.21

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 56.4  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.71  
 Intersection Signal Delay: 16.2  
 Intersection Capacity Utilization 54.3%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service A















Splits and Phases: 1: Smith Road & Ten-Ten Road












1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	951	470	192	708	223	68
Future Volume (vph)	4	951	470	192	708	223	68
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frnt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1057	522	213	787	248	76
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	1057	522	213	787	248	76
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.1	27.2	42.0	14.2	44.2	9.7	29.0
Actuated g/C Ratio	0.14	0.41	0.63	0.21	0.67	0.15	0.44
v/c Ratio	0.02	0.73	0.52	0.56	0.33	0.50	0.11
Control Delay	29.8	19.7	8.5	33.0	6.3	30.9	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	19.7	8.5	33.0	6.3	30.9	13.5
LOS	C	B	A	C	A	C	B
Approach Delay		16.0			12.0	26.9	
Approach LOS		B			B	C	
Queue Length 50th (ft)	1	178	98	76	50	47	17
Queue Length 95th (ft)	11	262	156	#191	155	93	50
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	270	2545	1583	379	2762	2311	691
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.42	0.33	0.56	0.28	0.11	0.11

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 66.4  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.73  
 Intersection Signal Delay: 15.8  
 Intersection Capacity Utilization 55.8%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B















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

Splits and Phases: 1: Smith Road & Ten-Ten Road










1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	541	138	36	793	658	200
Future Volume (vph)	4	541	138	36	793	658	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	601	153	40	881	731	222
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	601	153	40	881	731	222
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.5	18.6	41.5	7.3	29.4	17.5	30.2
Actuated g/C Ratio	0.16	0.31	0.70	0.12	0.49	0.29	0.51
v/c Ratio	0.01	0.54	0.14	0.18	0.50	0.72	0.28
Control Delay	29.8	18.8	2.9	31.7	13.2	24.0	11.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	29.8	18.8	2.9	31.7	13.2	24.0	11.0
LOS	C	B	A	C	B	C	B
Approach Delay		15.7			14.0	21.0	
Approach LOS		B			B	C	
Queue Length 50th (ft)	1	84	13	11	85	103	34
Queue Length 95th (ft)	12	168	25	53	268	242	125
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	315	2946	1558	441	3108	2764	1003
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.20	0.10	0.09	0.28	0.26	0.22

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 59.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.72

Intersection Signal Delay: 17.0

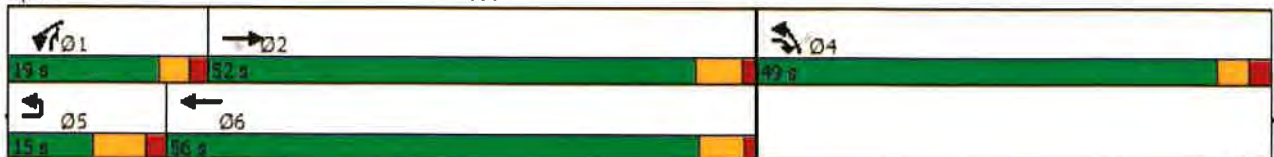
Intersection LOS: B

Intersection Capacity Utilization 57.0%

ICU Level of Service B















Analysis Period (min) 15

Splits and Phases: 1: Smith Road & Ten-Ten Road



1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	1008	498	204	751	236	73
Future Volume (vph)	4	1008	498	204	751	236	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Friction			0.850				0.850
Fit Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Fit Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1120	553	227	834	262	81
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	1120	553	227	834	262	81
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.2	29.8	45.0	14.2	46.8	10.1	29.5
Actuated g/C Ratio	0.13	0.43	0.65	0.20	0.67	0.15	0.43
v/c Ratio	0.02	0.74	0.54	0.63	0.35	0.52	0.12
Control Delay	31.5	19.8	8.5	37.4	6.3	32.8	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	19.8	8.5	37.4	6.3	32.8	14.9
LOS	C	B	A	D	A	C	B
Approach Delay		16.1			13.0	28.6	
Approach LOS		B			B	C	
Queue Length 50th (ft)	2	198	106	88	56	53	20
Queue Length 95th (ft)	11	285	167	#225	167	102	56
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	259	2438	1583	363	2664	2214	672
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.46	0.35	0.63	0.31	0.12	0.12

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 69.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 16.4

Intersection LOS: B

Intersection Capacity Utilization 58.4%

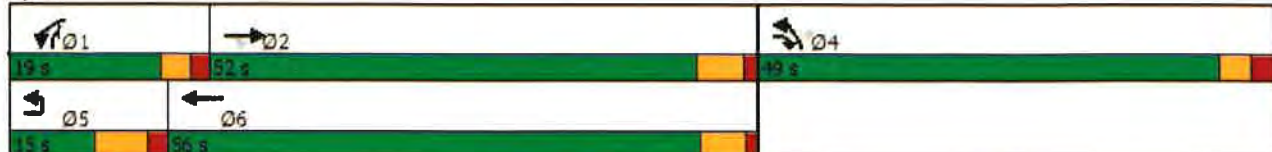
ICU Level of Service B

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.















Queue shown is maximum after two cycles.

Splits and Phases: 1: Smith Road & Ten-Ten Road



Lanes, Volumes, Timings  
1: Smith Road & Ten-Ten Road

Combined (2024) AM - Phase 1  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	510	170	44	748	744	220
Future Volume (vph)	4	510	170	44	748	744	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	567	189	49	831	827	244
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	567	189	49	831	827	244
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

Lanes, Volumes, Timings  
1: Smith Road & Ten-Ten Road

Combined (2024) AM - Phase 1  
06/28/2019

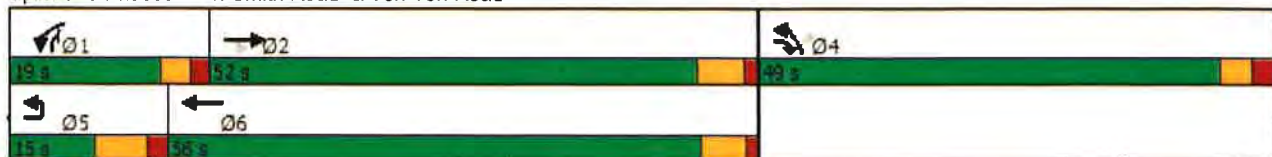
	↶	→	↘	↙	←	↖	↗
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.5	18.5	43.5	7.4	29.4	19.7	32.4
Actuated g/C Ratio	0.15	0.30	0.71	0.12	0.48	0.32	0.53
v/c Ratio	0.01	0.53	0.17	0.23	0.49	0.75	0.29
Control Delay	31.0	20.1	3.0	33.2	14.2	24.2	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	20.1	3.0	33.2	14.2	24.2	10.5
LOS	C	C	A	C	B	C	B
Approach Delay		15.9			15.3	21.1	
Approach LOS		B			B	C	
Queue Length 50th (ft)	1	83	16	15	86	121	38
Queue Length 95th (ft)	13	169	32	63	263	274	131
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	304	2863	1538	426	3040	2602	1024
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.20	0.12	0.12	0.27	0.32	0.24

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 61.5  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.75  
 Intersection Signal Delay: 17.8  
 Intersection Capacity Utilization 60.2%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B















Splits and Phases: 1: Smith Road & Ten-Ten Road





Lanes, Volumes, Timings  
1: Smith Road & Ten-Ten Road

Combined (2024) PM - Phase 1  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	951	606	226	708	302	88
Future Volume (vph)	4	951	606	226	708	302	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Fr			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1057	673	251	787	336	98
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	1057	673	251	787	336	98
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

Lanes, Volumes, Timings  
 1: Smith Road & Ten-Ten Road

Combined (2024) PM - Phase 1  
 06/28/2019

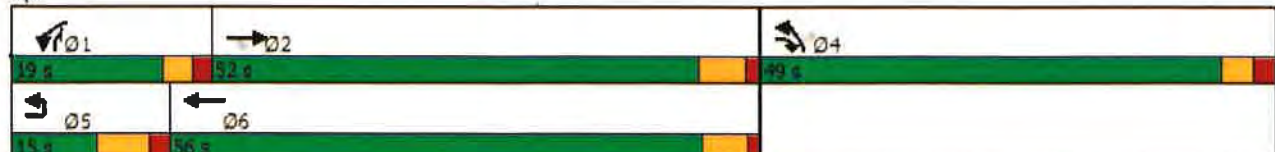
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.2	28.4	45.6	14.3	45.6	12.0	31.4
Actuated g/C Ratio	0.13	0.41	0.65	0.20	0.65	0.17	0.45
v/c Ratio	0.02	0.74	0.65	0.70	0.34	0.57	0.14
Control Delay	32.5	21.1	10.6	41.3	7.3	31.7	13.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	32.5	21.1	10.6	41.3	7.3	31.7	13.9
LOS	C	C	B	D	A	C	B
Approach Delay		17.1			15.5	27.7	
Approach LOS		B			B	C	
Queue Length 50th (ft)	2	191	147	99	58	68	23
Queue Length 95th (ft)	12	287	233	#266	173	125	63
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	258	2426	1583	361	2638	2203	710
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.44	0.43	0.70	0.30	0.15	0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 70.1  
 Natural Cycle: 55  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 18.0  
 Intersection Capacity Utilization 59.9%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B















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

Splits and Phases: 1: Smith Road & Ten-Ten Road



1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	581	138	42	826	658	217
Future Volume (vph)	4	581	138	42	826	658	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	646	153	47	918	731	241
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	646	153	47	918	731	241
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

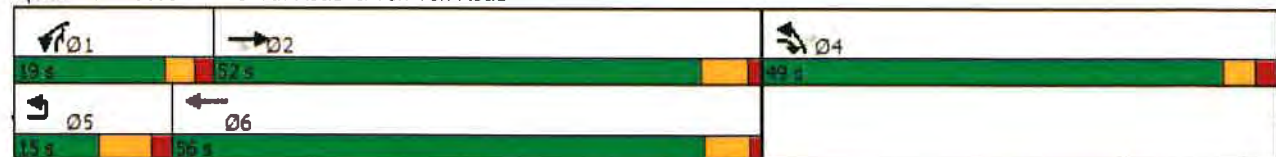
Combined (2026) AM - Full Buildout  
06/28/2019

Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.6	19.7	43.0	7.4	30.6	18.1	30.8
Actuated g/C Ratio	0.16	0.32	0.70	0.12	0.50	0.30	0.50
v/c Ratio	0.01	0.57	0.14	0.22	0.52	0.72	0.30
Control Delay	31.0	19.3	2.8	33.0	13.5	24.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.0	19.3	2.8	33.0	13.5	24.5	11.6
LOS	C	B	A	C	B	C	B
Approach Delay		16.2			14.4	21.3	
Approach LOS		B			B	C	
Queue Length 50th (ft)	1	93	13	14	93	109	42
Queue Length 95th (ft)	12	185	26	61	285	248	138
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	307	2874	1552	430	3045	2625	990
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.01	0.22	0.10	0.11	0.30	0.28	0.24

Intersection Summary















Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 61.1  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.72  
 Intersection Signal Delay: 17.4  
 Intersection Capacity Utilization 59.9%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 1: Smith Road & Ten-Ten Road










1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations							
Traffic Volume (vph)	4	1051	498	222	794	236	83
Future Volume (vph)	4	1051	498	222	794	236	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	400		600	250
Storage Lanes	1		1	1		1	1
Taper Length (ft)	100			100		100	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	0.97	1.00
Frt			0.850				0.850
Flt Protected	0.950			0.950		0.950	
Satd. Flow (prot)	1770	3539	1583	1770	3539	3433	1583
Flt Permitted	0.950			0.950		0.950	
Satd. Flow (perm)	1770	3539	1583	1770	3539	3433	1583
Right Turn on Red			No				No
Satd. Flow (RTOR)							
Link Speed (mph)		45			45	35	
Link Distance (ft)		1511			1269	1107	
Travel Time (s)		22.9			19.2	21.6	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	4	1168	553	247	882	262	92
Shared Lane Traffic (%)							
Lane Group Flow (vph)	4	1168	553	247	882	262	92
Enter Blocked Intersection	No	No	No	No	No	No	No
Lane Alignment	R NA	Left	Right	Left	Left	Left	Right
Median Width(ft)		16			16	24	
Link Offset(ft)		0			0	0	
Crosswalk Width(ft)		16			16	16	
Two way Left Turn Lane						Yes	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	9		9	15		15	9
Number of Detectors	1	2	0	1	2	1	1
Detector Template	Left						
Leading Detector (ft)	20	306	0	65	306	65	65
Trailing Detector (ft)	0	90	0	5	90	5	5
Detector 1 Position(ft)	0	90	0	5	90	5	5
Detector 1 Size(ft)	20	6	20	60	6	60	60
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel							
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	15.0	0.0	3.0	15.0
Detector 2 Position(ft)		300			300		
Detector 2 Size(ft)		6			6		
Detector 2 Type		Cl+Ex			Cl+Ex		
Detector 2 Channel							
Detector 2 Extend (s)		1.6			1.6		
Turn Type	Prot	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	5	2	4	1	6	4	1
Permitted Phases			2				4

1: Smith Road & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

							
Lane Group	EBU	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	5	2	4	1	6	4	1
Switch Phase							
Minimum Initial (s)	7.0	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	14.0	17.8	12.4	11.8	17.5	12.4	11.8
Total Split (s)	15.0	52.0	49.0	19.0	56.0	49.0	19.0
Total Split (%)	12.5%	43.3%	40.8%	15.8%	46.7%	40.8%	15.8%
Maximum Green (s)	8.0	46.2	43.6	14.2	50.5	43.6	14.2
Yellow Time (s)	5.0	4.5	3.0	3.0	4.4	3.0	3.0
All-Red Time (s)	2.0	1.3	2.4	1.8	1.1	2.4	1.8
Lost Time Adjust (s)	-2.0	-0.8	-0.4	0.2	-0.5	-0.4	0.2
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes
Vehicle Extension (s)	3.0	2.0	1.0	1.0	2.0	1.0	1.0
Recall Mode	None	Min	None	None	Min	None	None
Act Effct Green (s)	9.2	31.9	47.2	14.3	48.9	10.2	29.5
Actuated g/C Ratio	0.13	0.45	0.66	0.20	0.68	0.14	0.41
v/c Ratio	0.02	0.74	0.53	0.70	0.36	0.54	0.14
Control Delay	33.0	19.6	8.2	42.4	6.3	34.2	16.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.0	19.6	8.2	42.4	6.3	34.2	16.1
LOS	C	B	A	D	A	C	B
Approach Delay		15.9			14.2	29.5	
Approach LOS		B			B	C	
Queue Length 50th (ft)	2	212	106	101	61	55	24
Queue Length 95th (ft)	12	300	166	#264	178	106	66
Internal Link Dist (ft)		1431			1189	1027	
Turn Bay Length (ft)	400			400		600	250
Base Capacity (vph)	251	2365	1583	352	2610	2148	653
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.02	0.49	0.35	0.70	0.34	0.12	0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 71.6  
 Natural Cycle: 55  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.74  
 Intersection Signal Delay: 16.8  
 Intersection LOS: B  
 Intersection Capacity Utilization 60.6%  
 ICU Level of Service B  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Smith Road & Ten-Ten Road



# **APPENDIX F**

**CAPACITY ANALYSIS CALCULATIONS**

**NC 55 / NC 55 BYPASS**

**&**

**TECHNOLOGY DRIVE / E. WILLIAMS STREET**

Queuing and Blocking Report  
Existing (2019) AM

06/29/2019

Intersection: 5: NC 55 & Technology Drive/E. Williams Street

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	T	R	L	L
Maximum Queue (ft)	82	56	103	275	1369	475	48	369	389	174	240	210
Average Queue (ft)	47	18	26	273	1359	475	17	206	224	8	154	127
95th Queue (ft)	84	53	70	279	1370	475	37	321	326	62	231	199
Link Distance (ft)			1592		1354			4075	4075			
Upstream Blk Time (%)					31							
Queuing Penalty (veh)					464							
Storage Bay Dist (ft)	263	263		175		375	400			75	800	800
Storage Blk Time (%)				91					33			
Queuing Penalty (veh)				975					3			

Intersection: 5: NC 55 & Technology Drive/E. Williams Street

Movement	SB	SB	SB
Directions Served	T	T	R
Maximum Queue (ft)	183	203	200
Average Queue (ft)	80	80	27
95th Queue (ft)	152	166	94
Link Distance (ft)	894	894	
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			100
Storage Blk Time (%)		4	
Queuing Penalty (veh)		3	



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	17	24	404	58	1010	19	1285	10	347	690	65
Future Volume (vph)	64	17	24	404	58	1010	19	1285	10	347	690	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.715			0.745			0.950			0.950		
Satd. Flow (perm)	1332	1863	1583	1388	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	71	19	27	449	64	1122	21	1428	11	386	767	72
Shared Lane Traffic (%)												
Lane Group Flow (vph)	71	19	27	449	64	1122	21	1428	11	386	767	72
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
 Horton Park - Apex, NC

Existing (2019) AM  
 06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	20.4	20.4	34.2	20.4	20.4	118.1	8.7	61.9	61.9	20.4	76.9	76.9
Actuated g/C Ratio	0.17	0.17	0.29	0.17	0.17	1.00	0.07	0.52	0.52	0.17	0.65	0.65
v/c Ratio	0.31	0.06	0.06	1.87	0.20	0.71	0.16	0.77	0.01	0.65	0.33	0.07
Control Delay	52.8	48.9	37.5	437.3	49.7	2.7	61.3	25.5	13.5	52.5	9.7	8.1
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	52.8	48.9	37.5	437.3	49.7	2.7	61.3	25.5	13.5	52.5	9.7	8.1
LOS	D	D	D	F	D	A	E	C	B	D	A	A
Approach Delay		48.7			123.9			26.0			23.1	
Approach LOS		D			F			C			C	
Queue Length 50th (ft)	47	12	15	~511	41	0	15	430	4	139	133	20
Queue Length 95th (ft)	115	43	48	#914	103	0	49	579	14	229	169	37
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	230	322	547	240	322	1583	229	3317	1483	1039	3489	1560
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.06	0.05	1.87	0.20	0.71	0.09	0.43	0.01	0.37	0.22	0.05

Intersection Summary

Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 118.1  
 Natural Cycle: 110  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.87  
 Intersection Signal Delay: 61.9  
 Intersection Capacity Utilization 87.0%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

Intersection LOS: E  
 ICU Level of Service E

5: NC 55 & Technology Drive/E. Williams Street  
 Horton Park - Apex, NC

Existing (2019) AM  
 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	43	15	46	4	512	1	972	345	960	1467	45
Future Volume (vph)	40	43	15	46	4	512	1	972	345	960	1467	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.755			0.726			0.950			0.950		
Satd. Flow (perm)	1406	1863	1583	1352	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	44	48	17	51	4	569	1	1080	383	1067	1630	50
Shared Lane Traffic (%)												
Lane Group Flow (vph)	44	48	17	51	4	569	1	1080	383	1067	1630	50
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	11.1	11.1	21.2	11.0	11.0	106.6	8.5	48.0	48.0	35.7	85.4	85.4
Actuated g/C Ratio	0.10	0.10	0.20	0.10	0.10	1.00	0.08	0.45	0.45	0.33	0.80	0.80
v/c Ratio	0.30	0.25	0.05	0.37	0.02	0.36	0.01	0.68	0.54	0.93	0.58	0.04
Control Delay	53.7	51.0	36.7	56.1	47.8	0.6	53.0	26.2	25.3	50.7	7.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	51.0	36.7	56.1	47.8	0.6	53.0	26.2	25.3	50.7	7.6	4.9
LOS	D	D	D	E	D	A	D	C	C	D	A	A
Approach Delay		49.8			5.5			26.0			24.3	
Approach LOS		D			A			C			C	
Queue Length 50th (ft)	29	31	9	33	3	0	1	308	191	367	158	5
Queue Length 95th (ft)	72	75	32	81	14	0	7	414	304	#662	440	25
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	269	356	416	258	356	1583	254	3468	1551	1150	3539	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.13	0.04	0.20	0.01	0.36	0.00	0.31	0.25	0.93	0.46	0.03

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 106.6

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.93

Intersection Signal Delay: 23.0

Intersection Capacity Utilization 76.0%

Analysis Period (min) 15

Intersection LOS: C

ICU Level of Service D

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street















5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	21	28	482	68	1178	23	1512	12	415	800	75
Future Volume (vph)	74	21	28	482	68	1178	23	1512	12	415	800	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.686			0.742			0.950			0.950		
Satd. Flow (perm)	1278	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	23	31	536	76	1309	26	1680	13	461	889	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	23	31	536	76	1309	26	1680	13	461	889	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	20.6	20.6	34.9	20.6	20.6	147.2	9.2	84.8	84.8	26.4	105.4	105.4
Actuated g/C Ratio	0.14	0.14	0.24	0.14	0.14	1.00	0.06	0.58	0.58	0.18	0.72	0.72
v/c Ratio	0.46	0.09	0.08	2.79	0.29	0.83	0.24	0.82	0.01	0.75	0.35	0.07
Control Delay	74.7	66.0	53.0	839.7	67.4	5.1	79.7	29.0	13.4	67.4	8.4	6.7
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	74.7	66.0	53.0	839.7	67.4	5.1	79.7	29.0	13.4	67.4	8.4	6.7
LOS	E	E	D	F	E	A	E	C	B	E	A	A
Approach Delay		68.3			240.4			29.6				27.3
Approach LOS		E			F			C				C
Queue Length 50th (ft)	72	19	23	~862	65	0	24	646	5	214	162	23
Queue Length 95th (ft)	164	59	66	#1406	148	0	69	837	16	341	204	41
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	178	260	442	192	260	1583	185	2839	1270	838	3199	1430
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.09	0.07	2.79	0.29	0.83	0.14	0.59	0.01	0.55	0.28	0.06

Intersection Summary

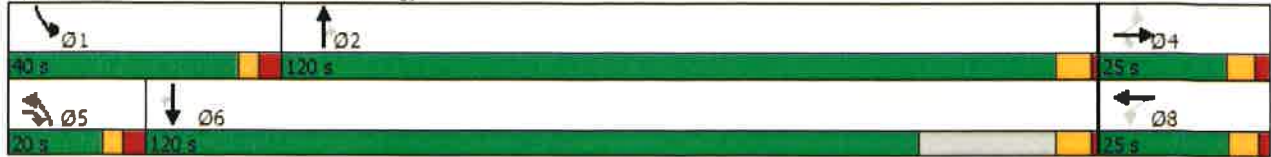
Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 147.2  
 Natural Cycle: 140  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 2.79  
 Intersection Signal Delay: 107.7  
 Intersection Capacity Utilization 99.5%  
 Analysis Period (min) 15  
 Intersection LOS: F  
 ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.



























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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	51	17	75	5	599	1	1144	400	1148	1701	52
Future Volume (vph)	46	51	17	75	5	599	1	1144	400	1148	1701	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	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	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.754			0.720			0.950			0.950		
Satd. Flow (perm)	1405	1863	1583	1341	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	57	19	83	6	666	1	1271	444	1276	1890	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	57	19	83	6	666	1	1271	444	1276	1890	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane				Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	14.4	14.4	28.0	14.4	14.4	127.3	8.5	61.8	61.8	35.7	95.3	95.3
Actuated g/C Ratio	0.11	0.11	0.22	0.11	0.11	1.00	0.07	0.49	0.49	0.28	0.75	0.75
v/c Ratio	0.32	0.27	0.05	0.55	0.03	0.42	0.01	0.74	0.58	1.33	0.71	0.05
Control Delay	61.4	58.6	44.4	70.5	55.8	0.8	66.0	28.9	26.6	190.4	12.1	5.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	58.6	44.4	70.5	55.8	0.8	66.0	28.9	26.6	190.4	12.1	5.9
LOS	E	E	D	E	E	A	E	C	C	F	B	A
Approach Delay		57.6			8.9			28.3			82.6	
Approach LOS		E			A			C			F	
Queue Length 50th (ft)	38	43	12	64	4	0	1	431	255	~697	485	14
Queue Length 95th (ft)	94	100	41	140	21	0	8	541	375	#1101	634	29
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	225	298	433	214	298	1583	212	3177	1421	963	3433	1536
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.19	0.04	0.39	0.02	0.42	0.00	0.40	0.31	1.33	0.55	0.04

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 127.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.33

Intersection Signal Delay: 56.5

Intersection Capacity Utilization 87.7%

Analysis Period (min) 15

Intersection LOS: E

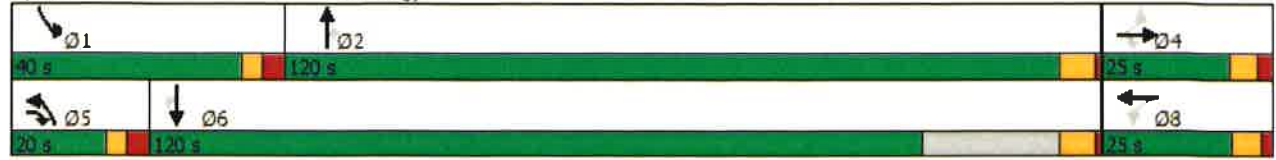
ICU Level of Service E

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street















5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	22	30	511	72	1249	24	1602	12	440	849	80
Future Volume (vph)	79	22	30	511	72	1249	24	1602	12	440	849	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	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	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.653			0.742			0.950			0.950		
Satd. Flow (perm)	1216	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	88	24	33	568	80	1388	27	1780	13	489	943	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	24	33	568	80	1388	27	1780	13	489	943	89
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	20.5	20.5	34.9	20.5	20.5	159.0	9.3	94.4	94.4	28.8	117.3	117.3
Actuated g/C Ratio	0.13	0.13	0.22	0.13	0.13	1.00	0.06	0.59	0.59	0.18	0.74	0.74
v/c Ratio	0.56	0.10	0.10	3.19	0.33	0.88	0.26	0.85	0.01	0.79	0.36	0.08
Control Delay	85.8	71.5	58.3	1023.2	74.0	7.3	86.0	31.0	13.4	73.8	8.0	6.3
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	85.8	71.5	58.3	1023.2	74.0	7.3	86.0	31.0	13.4	73.8	8.0	6.3
LOS	F	E	E	F	E	A	F	C	B	E	A	A
Approach Delay		77.2			293.3			31.6			29.1	
Approach LOS		E			F			C			C	
Queue Length 50th (ft)	88	23	28	~1037	77	0	28	764	5	252	175	24
Queue Length 95th (ft)	#187	61	70	#1489	156	0	71	935	16	362	220	44
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	156	240	408	178	240	1583	171	2622	1173	774	3045	1362
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.10	0.08	3.19	0.33	0.88	0.16	0.68	0.01	0.63	0.31	0.07

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 159

Natural Cycle: 140

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 3.19

Intersection Signal Delay: 128.6

Intersection Capacity Utilization 104.3%

Analysis Period (min) 15

Intersection LOS: F

ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.

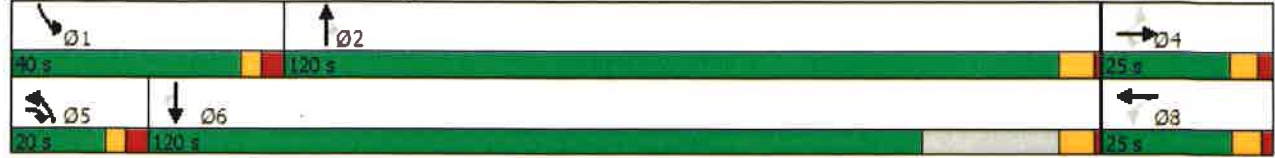
Queue shown is maximum after two cycles.

5: NC 55 & Technology Drive/E. Williams Street  
 Horton Park - Apex, NC

Background (2026) AM  
 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	54	18	79	5	635	1	1212	424	1216	1804	55
Future Volume (vph)	49	54	18	79	5	635	1	1212	424	1216	1804	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Flt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.754			0.718			0.950			0.950		
Satd. Flow (perm)	1405	1863	1583	1337	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	60	20	88	6	706	1	1347	471	1351	2004	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	60	20	88	6	706	1	1347	471	1351	2004	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	15.2	15.2	28.8	15.2	15.2	134.4	8.5	68.2	68.2	35.7	101.7	101.7
Actuated g/C Ratio	0.11	0.11	0.21	0.11	0.11	1.00	0.06	0.51	0.51	0.27	0.76	0.76
v/c Ratio	0.34	0.29	0.06	0.58	0.03	0.45	0.01	0.75	0.59	1.48	0.75	0.05
Control Delay	65.3	62.1	47.6	76.0	59.0	0.9	69.0	29.0	26.3	258.1	13.1	5.8
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	65.3	62.1	47.6	76.0	59.0	0.9	69.0	29.0	26.3	258.1	13.1	5.8
LOS	E	E	D	E	E	A	E	C	C	F	B	A
Approach Delay		61.2			9.6			28.3			109.8	
Approach LOS		E			A			C			F	
Queue Length 50th (ft)	43	48	14	73	5	0	1	480	281	~834	567	15
Queue Length 95th (ft)	100	107	43	151	22	0	8	588	404	#1223	720	31
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	213	282	419	203	282	1583	201	3038	1359	911	3358	1502
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.21	0.05	0.43	0.02	0.45	0.00	0.44	0.35	1.48	0.60	0.04

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 134.4

Natural Cycle: 110

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.48

Intersection Signal Delay: 71.8

Intersection Capacity Utilization 91.7%

Analysis Period (min) 15

Intersection LOS: E

ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.

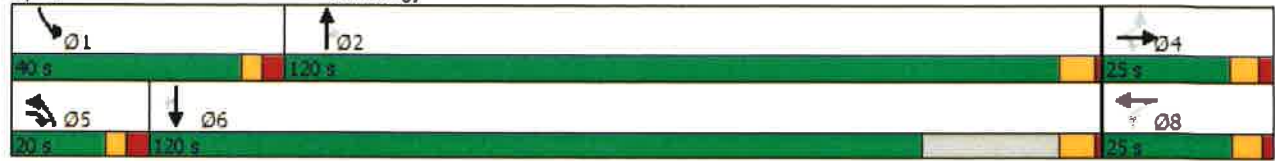
Queue shown is maximum after two cycles.

5: NC 55 & Technology Drive/E. Williams Street  
 Horton Park - Apex, NC

Background (2026) PM  
 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



Lanes, Volumes, Timings  
5: NC 55 & Technology Drive/E. Williams Street

Combined (2024) AM - Phase 1  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	21	28	503	68	1188	23	1512	19	418	800	75
Future Volume (vph)	74	21	28	503	68	1188	23	1512	19	418	800	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.685			0.742			0.950			0.950		
Satd. Flow (perm)	1276	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	23	31	559	76	1320	26	1680	21	464	889	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	23	31	559	76	1320	26	1680	21	464	889	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

Lanes, Volumes, Timings  
5: NC 55 & Technology Drive/E. Williams Street

Combined (2024) AM - Phase 1  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	20.5	20.5	34.9	20.5	20.5	147.6	9.2	85.1	85.1	26.5	105.9	105.9
Actuated g/C Ratio	0.14	0.14	0.24	0.14	0.14	1.00	0.06	0.58	0.58	0.18	0.72	0.72
v/c Ratio	0.46	0.09	0.08	2.91	0.29	0.83	0.24	0.82	0.02	0.75	0.35	0.07
Control Delay	75.1	66.1	53.2	896.4	67.7	5.3	79.9	29.0	13.5	67.6	8.4	6.7
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	75.1	66.1	53.2	896.4	67.7	5.3	79.9	29.0	13.5	67.6	8.4	6.7
LOS	E	E	D	F	E	A	E	C	B	E	A	A
Approach Delay		68.6			262.5			29.6			27.4	
Approach LOS		E			F			C			C	
Queue Length 50th (ft)	72	19	23	-909	66	0	24	648	8	216	162	23
Queue Length 95th (ft)	164	59	66	#1467	148	0	69	837	22	343	204	41
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	177	259	440	192	259	1583	184	2830	1266	835	3196	1429
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.09	0.07	2.91	0.29	0.83	0.14	0.59	0.02	0.56	0.28	0.06

Intersection Summary

Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 147.6  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 2.91  
 Intersection Signal Delay: 116.7  
 Intersection Capacity Utilization 100.8%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

Intersection LOS: F  
 ICU Level of Service G

**Lanes, Volumes, Timings**  
**5: NC 55 & Technology Drive/E. Williams Street**

**Combined (2024) AM - Phase 1**  
 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



Lanes, Volumes, Timings  
 5: NC 55 & Technology Drive/E. Williams Street

Combined (2024) PM - Phase 1  
 06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	51	17	88	5	606	1	1144	423	1159	1701	52
Future Volume (vph)	46	51	17	88	5	606	1	1144	423	1159	1701	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.754			0.720			0.950			0.950		
Satd. Flow (perm)	1405	1863	1583	1341	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	57	19	98	6	673	1	1271	470	1288	1890	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	57	19	98	6	673	1	1271	470	1288	1890	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

Lanes, Volumes, Timings  
5: NC 55 & Technology Drive/E. Williams Street

Combined (2024) PM - Phase 1  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	15.9	15.9	29.4	15.9	15.9	130.0	8.5	63.2	63.2	35.6	96.6	96.6
Actuated g/C Ratio	0.12	0.12	0.23	0.12	0.12	1.00	0.07	0.49	0.49	0.27	0.74	0.74
v/c Ratio	0.30	0.25	0.05	0.60	0.03	0.43	0.01	0.74	0.61	1.37	0.72	0.05
Control Delay	60.6	58.2	44.5	72.8	55.8	0.8	66.0	29.5	28.1	209.6	12.8	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.6	58.2	44.5	72.8	55.8	0.8	66.0	29.5	28.1	209.6	12.8	6.2
LOS	E	E	D	E	E	A	E	C	C	F	B	A
Approach Delay		57.1			10.3			29.1				91.0
Approach LOS		E			B			C				F
Queue Length 50th (ft)	39	44	13	79	5	0	1	447	287	~753	521	15
Queue Length 95th (ft)	94	100	41	161	21	0	8	541	405	#1113	634	29
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	219	291	441	209	291	1583	207	3119	1395	941	3419	1529
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.20	0.04	0.47	0.02	0.43	0.00	0.41	0.34	1.37	0.55	0.04

Intersection Summary

Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 130  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.37  
 Intersection Signal Delay: 61.3  
 Intersection Capacity Utilization 88.7%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

Intersection LOS: E  
 ICU Level of Service E

Lanes, Volumes, Timings  
 5: NC 55 & Technology Drive/E. Williams Street

Combined (2024) PM - Phase 1  
 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street

















5: NC 55 & Technology Drive/E. Williams Street Combined (2024) AM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	74	21	28	503	68	1188	23	1512	19	418	800	75
Future Volume (vph)	74	21	28	503	68	1188	23	1512	19	418	800	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Flt Protected	0.950		0.850	0.950		0.850	0.950		0.850	0.950		0.850
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.700			0.742			0.950			0.950		
Satd. Flow (perm)	1304	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	82	23	31	559	76	1320	26	1680	21	464	889	83
Shared Lane Traffic (%)												
Lane Group Flow (vph)	82	23	31	559	76	1320	26	1680	21	464	889	83
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street Combined (2024) AM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	63.0	63.0	15.0	63.0	63.0		15.0	94.0	94.0	28.0	107.0	107.0
Total Split (%)	34.1%	34.1%	8.1%	34.1%	34.1%		8.1%	50.8%	50.8%	15.1%	57.8%	57.8%
Maximum Green (s)	56.4	56.4	8.7	56.6	56.6		8.7	87.7	87.7	21.7	100.5	100.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	58.0	58.0	71.9	58.0	58.0	185.0	8.9	89.0	89.0	23.0	105.7	105.7
Actuated g/C Ratio	0.31	0.31	0.39	0.31	0.31	1.00	0.05	0.48	0.48	0.12	0.57	0.57
v/c Ratio	0.20	0.04	0.05	1.29	0.13	0.83	0.31	0.99	0.03	1.09	0.44	0.09
Control Delay	48.2	44.6	35.4	195.8	46.3	5.3	94.3	65.7	25.5	141.4	24.1	19.3
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	48.2	44.6	35.4	195.8	46.3	5.3	94.3	65.7	25.5	141.4	24.1	19.3
LOS	D	D	D	F	D	A	F	E	C	F	C	B
Approach Delay		44.7			61.4			65.6			61.7	
Approach LOS		D			E			E			E	
Queue Length 50th (ft)	74	20	24	~861	67	0	31	1052	13	~324	327	46
Queue Length 95th (ft)	124	45	49	#1110	113	0	69	#1227	32	#446	389	78
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	408	584	624	433	584	1583	95	1702	761	426	2022	904
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.04	0.05	1.29	0.13	0.83	0.27	0.99	0.03	1.09	0.44	0.09

Intersection Summary

Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 185  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.29  
 Intersection Signal Delay: 62.4  
 Intersection Capacity Utilization 100.8%  
 Analysis Period (min) 15  
 Intersection LOS: E  
 ICU Level of Service G

~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

5: NC 55 & Technology Drive/E. Williams Street Combined (2024) AM - Phase 1 - with Improvements  
 Horton Park - Apex, NC 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street















5: NC 55 & Technology Drive/E. Williams Street Combined (2024) PM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	51	17	88	5	606	1	1144	423	1159	1701	52
Future Volume (vph)	46	51	17	88	5	606	1	1144	423	1159	1701	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.754			0.712			0.950			0.950		
Satd. Flow (perm)	1405	1863	1583	1326	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	51	57	19	98	6	673	1	1271	470	1288	1890	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	51	57	19	98	6	673	1	1271	470	1288	1890	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street Combined (2024) PM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	26.0	26.0	16.0	26.0	26.0		16.0	78.0	78.0	81.0	143.0	143.0
Total Split (%)	14.1%	14.1%	8.6%	14.1%	14.1%		8.6%	42.2%	42.2%	43.8%	77.3%	77.3%
Maximum Green (s)	19.4	19.4	9.7	19.6	19.6		9.7	71.7	71.7	74.7	136.5	136.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	17.5	17.5	30.9	17.5	17.5	173.3	8.4	70.2	70.2	70.5	138.2	138.2
Actuated g/C Ratio	0.10	0.10	0.18	0.10	0.10	1.00	0.05	0.41	0.41	0.41	0.80	0.80
v/c Ratio	0.36	0.30	0.07	0.74	0.03	0.43	0.01	0.89	0.73	0.92	0.67	0.05
Control Delay	83.0	79.4	63.1	108.4	73.6	0.8	85.0	57.4	53.2	60.9	10.3	5.0
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	83.0	79.4	63.1	108.4	73.6	0.8	85.0	57.4	53.2	60.9	10.3	5.0
LOS	F	E	E	F	E	A	F	E	D	E	B	A
Approach Delay		78.4			15.0			56.3				30.3
Approach LOS		E			B			E				C
Queue Length 50th (ft)	58	64	19	116	7	0	1	757	485	748	546	15
Queue Length 95th (ft)	109	117	48	#196	24	0	8	873	645	864	633	29
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	172	228	307	162	228	1583	113	1507	674	1522	2916	1304
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.25	0.06	0.60	0.03	0.43	0.01	0.84	0.70	0.85	0.65	0.04

Intersection Summary

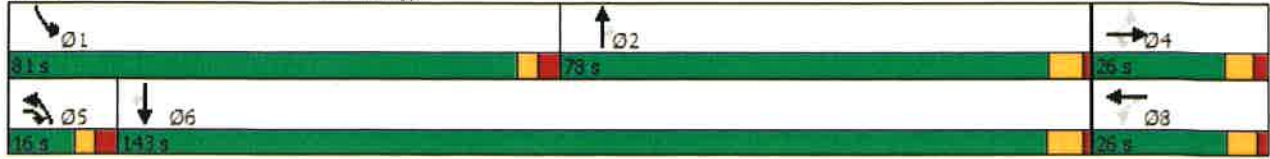
Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 173.3  
 Natural Cycle: 90  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 37.0  
 Intersection Capacity Utilization 88.7%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Intersection LOS: D  
 ICU Level of Service E

5: NC 55 & Technology Drive/E. Williams Street Combined (2024) PM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street















5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	22	30	528	72	1249	24	1612	18	440	867	80
Future Volume (vph)	79	22	30	528	72	1249	24	1612	18	440	867	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Flt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.652			0.742			0.950			0.950		
Satd. Flow (perm)	1215	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	88	24	33	587	80	1388	27	1791	20	489	963	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	24	33	587	80	1388	27	1791	20	489	963	89
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	20.5	20.5	34.9	20.5	20.5	159.5	9.3	94.8	94.8	28.8	117.8	117.8
Actuated g/C Ratio	0.13	0.13	0.22	0.13	0.13	1.00	0.06	0.59	0.59	0.18	0.74	0.74
v/c Ratio	0.57	0.10	0.10	3.32	0.33	0.88	0.26	0.85	0.02	0.79	0.37	0.08
Control Delay	86.3	71.6	58.5	1077.2	74.2	7.3	86.2	31.2	13.4	74.0	8.1	6.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	86.3	71.6	58.5	1077.2	74.2	7.3	86.2	31.2	13.4	74.0	8.1	6.2
LOS	F	E	E	F	E	A	F	C	B	E	A	A
Approach Delay		77.5			315.5			31.8				28.9
Approach LOS		E			F			C				C
Queue Length 50th (ft)	88	23	28	~1086	78	0	28	775	8	254	180	24
Queue Length 95th (ft)	#187	61	70	#1540	156	0	71	947	22	362	226	44
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	155	239	406	177	239	1583	170	2612	1168	771	3036	1358
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.57	0.10	0.08	3.32	0.33	0.88	0.16	0.69	0.02	0.63	0.32	0.07

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 159.5

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 3.32

Intersection Signal Delay: 136.7

Intersection LOS: F

Intersection Capacity Utilization 105.5%

ICU Level of Service G

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.



























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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	54	18	89	5	635	1	1231	442	1216	1818	55
Future Volume (vph)	49	54	18	89	5	635	1	1231	442	1216	1818	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	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	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.754			0.718			0.950			0.950		
Satd. Flow (perm)	1405	1863	1583	1337	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	54	60	20	99	6	706	1	1368	491	1351	2020	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	60	20	99	6	706	1	1368	491	1351	2020	61
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	20.0	25.0	25.0		20.0	120.0	120.0	40.0	120.0	120.0
Total Split (%)	13.5%	13.5%	10.8%	13.5%	13.5%		10.8%	64.9%	64.9%	21.6%	64.9%	64.9%
Maximum Green (s)	18.4	18.4	13.7	18.6	18.6		13.7	113.7	113.7	33.7	113.5	113.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	16.4	16.4	30.0	16.4	16.4	138.1	8.5	70.8	70.8	35.7	104.2	104.2
Actuated g/C Ratio	0.12	0.12	0.22	0.12	0.12	1.00	0.06	0.51	0.51	0.26	0.75	0.75
v/c Ratio	0.32	0.27	0.06	0.63	0.03	0.45	0.01	0.75	0.61	1.52	0.76	0.05
Control Delay	65.7	62.8	48.6	79.2	60.2	0.9	71.0	29.4	27.1	277.2	13.6	5.8
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	65.7	62.8	48.6	79.2	60.2	0.9	71.0	29.4	27.1	277.2	13.6	5.8
LOS	E	E	D	E	E	A	E	C	C	F	B	A
Approach Delay		61.8			10.9			28.8			117.2	
Approach LOS		E			B			C			F	
Queue Length 50th (ft)	45	49	14	85	5	0	1	508	308	~884	613	16
Queue Length 95th (ft)	102	108	44	169	22	0	8	602	426	#1246	731	31
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	207	274	421	197	274	1583	195	2971	1329	886	3318	1484
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.22	0.05	0.50	0.02	0.45	0.01	0.46	0.37	1.52	0.61	0.04

Intersection Summary

Area Type: Other

Cycle Length: 185

Actuated Cycle Length: 138.1

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.52

Intersection Signal Delay: 75.8

Intersection Capacity Utilization 92.8%

Analysis Period (min) 15

Intersection LOS: E

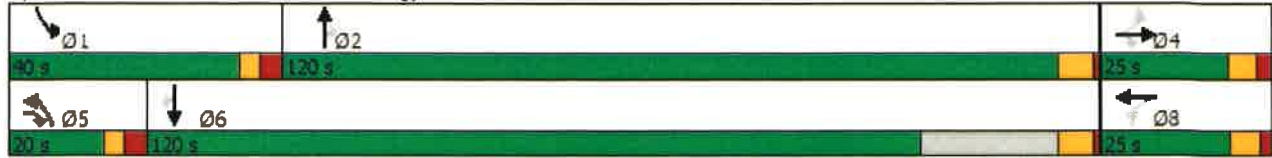
ICU Level of Service F

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. William Street (2026) AM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	79	22	30	528	72	1249	24	1612	18	440	867	80
Future Volume (vph)	79	22	30	528	72	1249	24	1612	18	440	867	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	263		0	175		375	400		75	800		100
Storage Lanes	2		1	1		1	1		1	2		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00
Frnt			0.850			0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583
Flt Permitted	0.705			0.742			0.950			0.950		
Satd. Flow (perm)	1313	1863	1583	1382	1863	1583	1770	3539	1583	3433	3539	1583
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		45			45			55			45	
Link Distance (ft)		1661			1452			4132			954	
Travel Time (s)		25.2			22.0			51.2			14.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	88	24	33	587	80	1388	27	1791	20	489	963	89
Shared Lane Traffic (%)												
Lane Group Flow (vph)	88	24	33	587	80	1388	27	1791	20	489	963	89
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			36			36	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane					Yes							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	5		8		5	2		1	6	
Permitted Phases	4		4	8		Free			2			6

5: NC 55 & Technology Drive/E. Williams Street (2026) AM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	56.0	56.0	15.0	56.0	56.0		15.0	71.0	71.0	23.0	79.0	79.0
Total Split (%)	37.3%	37.3%	10.0%	37.3%	37.3%		10.0%	47.3%	47.3%	15.3%	52.7%	52.7%
Maximum Green (s)	49.4	49.4	8.7	49.6	49.6		8.7	64.7	64.7	16.7	72.5	72.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	51.0	51.0	64.8	51.0	51.0	150.0	8.8	66.0	66.0	18.0	77.9	77.9
Actuated g/C Ratio	0.34	0.34	0.43	0.34	0.34	1.00	0.06	0.44	0.44	0.12	0.52	0.52
v/c Ratio	0.20	0.04	0.05	1.25	0.13	0.88	0.26	1.15	0.03	1.19	0.52	0.11
Control Delay	36.6	33.5	24.9	170.9	34.9	7.5	73.8	114.0	24.1	161.6	25.8	20.0
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	36.6	33.5	24.9	170.9	34.9	7.5	73.8	114.0	24.1	161.6	25.8	20.0
LOS	D	C	C	F	C	A	E	F	C	F	C	C
Approach Delay		33.4			55.3			112.5			68.6	
Approach LOS		C			E			F			E	
Queue Length 50th (ft)	61	16	19	~714	54	0	26	~1081	11	~295	330	45
Queue Length 95th (ft)	108	38	40	#952	95	0	60	#1217	28	#411	404	80
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	446	633	696	469	633	1583	118	1557	696	411	1837	821
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.04	0.05	1.25	0.13	0.88	0.23	1.15	0.03	1.19	0.52	0.11

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.25  
 Intersection Signal Delay: 77.2  
 Intersection Capacity Utilization 105.5%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.

Intersection LOS: E  
 ICU Level of Service G

5: NC 55 & Technology Drive/E. Williams Street (2026) AM - Full Buildout - with Improvements  
 Horton Park - Apex, NC 06/28/2019

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

Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



5: NC 55 & Technology Drive/E. William Street (2026) PM - Full Buildout - with Improvements  
 Horton Park - Apex, NC













06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	49	54	18	89	5	635	1	1231	442	1216	1818	55	
Future Volume (vph)	49	54	18	89	5	635	1	1231	442	1216	1818	55	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	263		0	175		375	400		75	800		100	
Storage Lanes	2		1	1		1	1		1	2		1	
Taper Length (ft)	100			100			100			100			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	0.97	0.95	1.00	
Frnt			0.850			0.850			0.850			0.850	
Flt Protected	0.950			0.950			0.950			0.950			
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583	1770	3539	1583	3433	3539	1583	
Flt Permitted	0.754			0.689			0.950			0.950			
Satd. Flow (perm)	1405	1863	1583	1283	1863	1583	1770	3539	1583	3433	3539	1583	
Right Turn on Red			No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		45			45			55			45		
Link Distance (ft)		1661			1452			4132			954		
Travel Time (s)		25.2			22.0			51.2			14.5		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	54	60	20	99	6	706	1	1368	491	1351	2020	61	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	54	60	20	99	6	706	1	1368	491	1351	2020	61	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		16			16			36			36		
Link Offset(ft)		0			0			0			0		
Crosswalk Width(ft)		16			16			16			16		
Two way Left Turn Lane					Yes								
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	1	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	20	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel													
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94		
Detector 2 Size(ft)		6			6			6			6		
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex		
Detector 2 Channel													
Detector 2 Extend (s)		0.0			0.0			0.0			0.0		
Turn Type	Perm	NA	pm+ov	Perm	NA	Free	Prot	NA	Perm	Prot	NA	Perm	
Protected Phases		4	5		8		5	2		1	6		
Permitted Phases	4		4	8		Free			2			6	



5: NC 55 & Technology Drive/E. William Street (2026) PM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4	5	8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0		7.0	14.0	14.0	7.0	14.0	14.0
Minimum Split (s)	13.6	13.6	13.3	13.4	13.4		13.3	20.3	20.3	13.3	20.5	20.5
Total Split (s)	25.0	25.0	15.0	25.0	25.0		15.0	80.0	80.0	80.0	145.0	145.0
Total Split (%)	13.5%	13.5%	8.1%	13.5%	13.5%		8.1%	43.2%	43.2%	43.2%	78.4%	78.4%
Maximum Green (s)	18.4	18.4	8.7	18.6	18.6		8.7	73.7	73.7	73.7	138.5	138.5
Yellow Time (s)	4.2	4.2	3.0	4.6	4.6		3.0	5.1	5.1	3.0	5.3	5.3
All-Red Time (s)	2.4	2.4	3.3	1.8	1.8		3.3	1.2	1.2	3.3	1.2	1.2
Lost Time Adjust (s)	-1.6	-1.6	-1.3	-1.4	-1.4		-1.3	-1.3	-1.3	-1.3	-1.5	-1.5
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead				Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?			Yes				Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	2.0	2.0	2.0	2.0	2.0		2.0	6.0	6.0	3.0	6.0	6.0
Minimum Gap (s)	2.0	2.0	2.0	2.0	2.0		2.0	3.4	3.4	3.0	3.4	3.4
Time Before Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	20.0	20.0	0.0	20.0	20.0
Time To Reduce (s)	0.0	0.0	0.0	0.0	0.0		0.0	30.0	30.0	0.0	30.0	30.0
Recall Mode	None	None	None	None	None		None	Min	Min	None	Min	Min
Act Effct Green (s)	17.8	17.8	31.1	17.8	17.8	181.1	8.3	74.6	74.6	73.8	145.5	145.5
Actuated g/C Ratio	0.10	0.10	0.17	0.10	0.10	1.00	0.05	0.41	0.41	0.41	0.80	0.80
v/c Ratio	0.39	0.33	0.07	0.79	0.03	0.45	0.01	0.94	0.75	0.97	0.71	0.05
Control Delay	85.8	81.6	64.1	118.3	74.4	0.9	85.0	64.2	54.9	69.4	11.1	4.8
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	85.8	81.6	64.1	118.3	74.4	0.9	85.0	64.2	54.9	69.4	11.1	4.8
LOS	F	F	E	F	E	A	F	E	D	E	B	A
Approach Delay		80.7			15.8			61.8			33.9	
Approach LOS		F			B			E			C	
Queue Length 50th (ft)	62	68	20	118	7	0	1	848	514	829	642	16
Queue Length 95th (ft)	114	122	49	#213	25	0	8	#998	674	#985	714	29
Internal Link Dist (ft)		1581			1372			4052			874	
Turn Bay Length (ft)	263			175		375	400		75	800		100
Base Capacity (vph)	155	206	286	141	206	1583	97	1467	656	1423	2843	1272
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.29	0.07	0.70	0.03	0.45	0.01	0.93	0.75	0.95	0.71	0.05

Intersection Summary

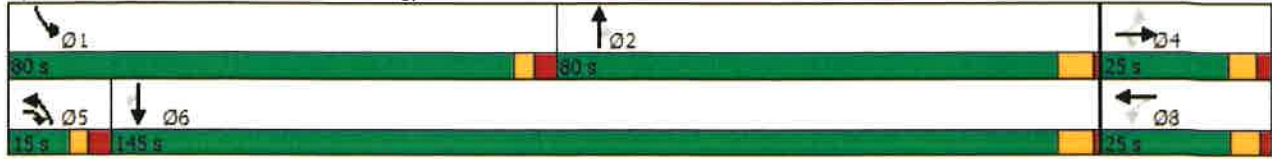
Area Type: Other  
 Cycle Length: 185  
 Actuated Cycle Length: 181.1  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.97  
 Intersection Signal Delay: 40.9  
 Intersection Capacity Utilization 92.8%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Intersection LOS: D  
 ICU Level of Service F

5: NC 55 & Technology Drive/E. Williams Street (2026) PM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

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Splits and Phases: 5: NC 55 & Technology Drive/E. Williams Street



# **APPENDIX G**

**CAPACITY ANALYSIS CALCULATIONS**

**SMITH ROAD**

**&**

**STEPHENSON ROAD**

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

Intersection

Int Delay, s/veh	3.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	72	11	5	626	100	41
Future Vol, veh/h	72	11	5	626	100	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	80	12	6	696	111	46

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	702	0	-	0	526
Stage 1	-	-	-	-	354
Stage 2	-	-	-	-	172
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	895	-	-	-	512
Stage 1	-	-	-	-	710
Stage 2	-	-	-	-	858
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	895	-	-	-	466
Mov Cap-2 Maneuver	-	-	-	-	466
Stage 1	-	-	-	-	646
Stage 2	-	-	-	-	858

Approach	EB	WB	SB
HCM Control Delay, s	8.2	0	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	895	-	-	-	466	690
HCM Lane V/C Ratio	0.089	-	-	-	0.238	0.066
HCM Control Delay (s)	9.4	0	-	-	15.1	10.6
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.3	-	-	-	0.9	0.2

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

Intersection

Int Delay, s/veh	16.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	56	11	13	195	491	80
Future Vol, veh/h	56	11	13	195	491	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	12	14	217	546	89

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	231	0	-	0	259
Stage 1	-	-	-	-	123
Stage 2	-	-	-	-	136
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1337	-	-	-	730
Stage 1	-	-	-	-	902
Stage 2	-	-	-	-	890
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1337	-	-	-	696
Mov Cap-2 Maneuver	-	-	-	-	696
Stage 1	-	-	-	-	860
Stage 2	-	-	-	-	890

Approach	EB	WB	SB
HCM Control Delay, s	6.5	0	23.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1337	-	-	-	696	928
HCM Lane V/C Ratio	0.047	-	-	-	0.784	0.096
HCM Control Delay (s)	7.8	0	-	-	26.3	9.3
HCM Lane LOS	A	A	-	-	D	A
HCM 95th %tile Q(veh)	0.1	-	-	-	7.7	0.3

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

Intersection

Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↖	↗		↘	↙
Traffic Vol, veh/h	83	13	6	726	116	48
Future Vol, veh/h	83	13	6	726	116	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	92	14	7	807	129	53

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	814	0	-	0	609 411
Stage 1	-	-	-	-	411 -
Stage 2	-	-	-	-	198 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	813	-	-	-	458 641
Stage 1	-	-	-	-	669 -
Stage 2	-	-	-	-	835 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	813	-	-	-	406 641
Mov Cap-2 Maneuver	-	-	-	-	406 -
Stage 1	-	-	-	-	593 -
Stage 2	-	-	-	-	835 -

Approach	EB	WB	SB
HCM Control Delay, s	8.6	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	813	-	-	-	406	641
HCM Lane V/C Ratio	0.113	-	-	-	0.317	0.083
HCM Control Delay (s)	10	0	-	-	17.9	11.1
HCM Lane LOS	A	A	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.3	0.3

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

Intersection

Int Delay, s/veh	32.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	65	13	15	226	569	93
Future Vol, veh/h	65	13	15	226	569	93
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	72	14	17	251	632	103

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	268	0	-	0	301 143
Stage 1	-	-	-	-	143 -
Stage 2	-	-	-	-	158 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1296	-	-	-	691 905
Stage 1	-	-	-	-	884 -
Stage 2	-	-	-	-	871 -
Platoon blocked, %	-	-	-	-	- -
Mov Cap-1 Maneuver	1296	-	-	-	652 905
Mov Cap-2 Maneuver	-	-	-	-	652 -
Stage 1	-	-	-	-	834 -
Stage 2	-	-	-	-	871 -

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	47.1
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1296	-	-	-	652	905
HCM Lane V/C Ratio	0.056	-	-	-	0.97	0.114
HCM Control Delay (s)	7.9	0	-	-	53.3	9.5
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0.2	-	-	-	14.2	0.4

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Intersection

Int Delay, s/veh	3.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	89	14	6	770	123	50
Future Vol, veh/h	89	14	6	770	123	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	16	7	856	137	56

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	863	0	-	0	649 435
Stage 1	-	-	-	-	435 -
Stage 2	-	-	-	-	214 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	779	-	-	-	434 621
Stage 1	-	-	-	-	653 -
Stage 2	-	-	-	-	822 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	779	-	-	-	378 621
Mov Cap-2 Maneuver	-	-	-	-	378 -
Stage 1	-	-	-	-	569 -
Stage 2	-	-	-	-	822 -

Approach	EB	WB	SB
HCM Control Delay, s	8.9	0	17.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	779	-	-	-	378	621
HCM Lane V/C Ratio	0.127	-	-	-	0.362	0.089
HCM Control Delay (s)	10.3	0	-	-	19.8	11.4
HCM Lane LOS	B	A	-	-	C	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.6	0.3



2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Intersection

Int Delay, s/veh	47.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	69	14	16	240	604	98
Future Vol, veh/h	69	14	16	240	604	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	77	16	18	267	671	109

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	285	0	-	0	322 152
Stage 1	-	-	-	-	152 -
Stage 2	-	-	-	-	170 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1277	-	-	-	672 894
Stage 1	-	-	-	-	876 -
Stage 2	-	-	-	-	860 -
Platoon blocked, %	-	-	-	-	- -
Mov Cap-1 Maneuver	1277	-	-	-	~ 631 894
Mov Cap-2 Maneuver	-	-	-	-	~ 631 -
Stage 1	-	-	-	-	823 -
Stage 2	-	-	-	-	860 -

Approach	EB	WB	SB
HCM Control Delay, s	6.6	0	69.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1277	-	-	-	631	894
HCM Lane V/C Ratio	0.06	-	-	-	1.064	0.122
HCM Control Delay (s)	8	0	-	-	79.2	9.6
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0.2	-	-	-	18.6	0.4

Notes

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

HCM 6th TWSC  
2: Smith Road & Stephenson Road

Combined (2024) AM - Phase 1  
06/28/2019

Intersection

Int Delay, s/veh	8.8					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	238	24	10	726	116	98
Future Vol, veh/h	238	24	10	726	116	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	264	27	11	807	129	109

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	818	0	-	0	970
Stage 1	-	-	-	-	415
Stage 2	-	-	-	-	555
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	810	-	-	-	281
Stage 1	-	-	-	-	666
Stage 2	-	-	-	-	575
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	810	-	-	-	188
Mov Cap-2 Maneuver	-	-	-	-	188
Stage 1	-	-	-	-	446
Stage 2	-	-	-	-	575

Approach	EB	WB	SB
HCM Control Delay, s	10.5	0	36.8
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	810	-	-	-	188	637
HCM Lane V/C Ratio	0.326	-	-	-	0.686	0.171
HCM Control Delay (s)	11.6	0	-	-	57.9	11.8
HCM Lane LOS	B	A	-	-	F	B
HCM 95th %tile Q(veh)	1.4	-	-	-	4.2	0.6

HCM 6th TWSC  
2: Smith Road & Stephenson Road

Combined (2024) PM - Phase 1  
06/28/2019

Intersection

Int Delay, s/veh 114.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	164	19	27	226	569	263
Future Vol, veh/h	164	19	27	226	569	263
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	182	21	30	251	632	292

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	281	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1282	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1282	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	7.4	0	173.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1282	-	-	-	430	890
HCM Lane V/C Ratio	0.142	-	-	-	1.47	0.328
HCM Control Delay (s)	8.3	0	-	-	248.6	11
HCM Lane LOS	A	A	-	-	F	B
HCM 95th %tile Q(veh)	0.5	-	-	-	32.6	1.4

Notes

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

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Combined (2024) AM - Phase 1 - with Improvements

06/28/2019

Intersection

Int Delay, s/veh	8.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑	↔		↘	↗
Traffic Vol, veh/h	238	24	10	726	116	98
Future Vol, veh/h	238	24	10	726	116	98
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	264	27	11	807	129	109

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	818	0	-	0	970 415
Stage 1	-	-	-	-	415 -
Stage 2	-	-	-	-	555 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	810	-	-	-	281 637
Stage 1	-	-	-	-	666 -
Stage 2	-	-	-	-	575 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	810	-	-	-	189 637
Mov Cap-2 Maneuver	-	-	-	-	189 -
Stage 1	-	-	-	-	449 -
Stage 2	-	-	-	-	575 -

Approach	EB	WB	SB
HCM Control Delay, s	10.5	0	36.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	810	-	-	-	189	637
HCM Lane V/C Ratio	0.326	-	-	-	0.682	0.171
HCM Control Delay (s)	11.6	-	-	-	57.2	11.8
HCM Lane LOS	B	-	-	-	F	B
HCM 95th %tile Q(veh)	1.4	-	-	-	4.1	0.6

Intersection

Int Delay, s/veh 114.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑	↗		↘	↗
Traffic Vol, veh/h	164	19	27	226	569	263
Future Vol, veh/h	164	19	27	226	569	263
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	182	21	30	251	632	292

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	281	0	0
Stage 1	-	-	156
Stage 2	-	-	385
Critical Hdwy	4.12	-	6.42
Critical Hdwy Stg 1	-	-	5.42
Critical Hdwy Stg 2	-	-	5.42
Follow-up Hdwy	2.218	-	3.518
Pot Cap-1 Maneuver	1282	-	~ 502
Stage 1	-	-	872
Stage 2	-	-	688
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1282	-	~ 431
Mov Cap-2 Maneuver	-	-	~ 431
Stage 1	-	-	748
Stage 2	-	-	688

Approach	EB	WB	SB
HCM Control Delay, s	7.4	0	172.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1282	-	-	-	431	890
HCM Lane V/C Ratio	0.142	-	-	-	1.467	0.328
HCM Control Delay (s)	8.3	-	-	-	247	11
HCM Lane LOS	A	-	-	-	F	B
HCM 95th %tile Q(veh)	0.5	-	-	-	32.5	1.4

Notes

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

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	106	33	15	770	123	56
Future Vol, veh/h	106	33	15	770	123	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	37	17	856	137	62

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	873	0	-	0	718 445
Stage 1	-	-	-	-	445 -
Stage 2	-	-	-	-	273 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	773	-	-	-	396 613
Stage 1	-	-	-	-	646 -
Stage 2	-	-	-	-	773 -
Platoon blocked, %	-	-	-	-	- -
Mov Cap-1 Maneuver	773	-	-	-	334 613
Mov Cap-2 Maneuver	-	-	-	-	334 -
Stage 1	-	-	-	-	545 -
Stage 2	-	-	-	-	773 -

Approach	EB	WB	SB
HCM Control Delay, s	8	0	19.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	773	-	-	-	334	613
HCM Lane V/C Ratio	0.152	-	-	-	0.409	0.102
HCM Control Delay (s)	10.5	0	-	-	23	11.5
HCM Lane LOS	B	A	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	1.9	0.3

2: Smith Road & Stephenson Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	64.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	↕
Traffic Vol, veh/h	79	29	34	240	604	116
Future Vol, veh/h	79	29	34	240	604	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	32	38	267	671	129

Major/Minor	Major1	Major2		Minor2	
Conflicting Flow All	305	0	-	0	380
Stage 1	-	-	-	-	172
Stage 2	-	-	-	-	208
Critical Hdwy	4.12	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.218	-	-	-	3.518
Pot Cap-1 Maneuver	1256	-	-	-	~622
Stage 1	-	-	-	-	858
Stage 2	-	-	-	-	827
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1256	-	-	-	~578
Mov Cap-2 Maneuver	-	-	-	-	~578
Stage 1	-	-	-	-	797
Stage 2	-	-	-	-	827

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	98.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1256	-	-	-	578	872
HCM Lane V/C Ratio	0.07	-	-	-	1.161	0.148
HCM Control Delay (s)	8.1	0	-	-	115.1	9.8
HCM Lane LOS	A	A	-	-	F	A
HCM 95th %tile Q(veh)	0.2	-	-	-	22.7	0.5

Notes

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

2: Smith Road & Stephenson Road Combined (2026) AM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Intersection

Int Delay, s/veh	4.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↙	↑	↘		↙	↗
Traffic Vol, veh/h	106	33	15	770	123	56
Future Vol, veh/h	106	33	15	770	123	56
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	118	37	17	856	137	62

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	873	0	0	718	445
Stage 1	-	-	-	445	-
Stage 2	-	-	-	273	-
Critical Hdwy	4.12	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	3.518	3.318
Pot Cap-1 Maneuver	773	-	-	396	613
Stage 1	-	-	-	646	-
Stage 2	-	-	-	773	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	773	-	-	335	613
Mov Cap-2 Maneuver	-	-	-	335	-
Stage 1	-	-	-	547	-
Stage 2	-	-	-	773	-

Approach	EB	WB	SB
HCM Control Delay, s	8	0	19.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	773	-	-	-	335	613
HCM Lane V/C Ratio	0.152	-	-	-	0.408	0.102
HCM Control Delay (s)	10.5	-	-	-	23	11.5
HCM Lane LOS	B	-	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	1.9	0.3



2: Smith Road & Stephenson Road Combined (2026) PM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

06/28/2019

Intersection

Int Delay, s/veh	64.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↘	↑	↙		↘	↗
Traffic Vol, veh/h	79	29	34	240	604	116
Future Vol, veh/h	79	29	34	240	604	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	100	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	88	32	38	267	671	129

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	305	0	-	0	380 172
Stage 1	-	-	-	-	172 -
Stage 2	-	-	-	-	208 -
Critical Hdwy	4.12	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.218	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1256	-	-	-	~622 872
Stage 1	-	-	-	-	858 -
Stage 2	-	-	-	-	827 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1256	-	-	-	~578 872
Mov Cap-2 Maneuver	-	-	-	-	~578 -
Stage 1	-	-	-	-	798 -
Stage 2	-	-	-	-	827 -

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	98.1
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1256	-	-	-	578	872
HCM Lane V/C Ratio	0.07	-	-	-	1.161	0.148
HCM Control Delay (s)	8.1	-	-	-	115.1	9.8
HCM Lane LOS	A	-	-	-	F	A
HCM 95th %tile Q(veh)	0.2	-	-	-	22.7	0.5

Notes

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

# **APPENDIX H**

**CAPACITY ANALYSIS CALCULATIONS**

**SMITH ROAD**

**&**

**DEZOLA STREET**

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

Intersection

Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	1	4	4	75	21	4
Future Vol, veh/h	1	4	4	75	21	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	4	4	83	23	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	116	25	27	0	-	0
Stage 1	25	-	-	-	-	-
Stage 2	91	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	880	1051	1587	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	933	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	877	1051	1587	-	-	-
Mov Cap-2 Maneuver	877	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	933	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1587	-	1011	-	-
HCM Lane V/C Ratio	0.003	-	0.005	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

Intersection

Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	WT			WT	WT	
Traffic Vol, veh/h	6	4	4	29	65	3
Future Vol, veh/h	6	4	4	29	65	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	4	32	72	3

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	114	74	75	0	0
Stage 1	74	-	-	-	-
Stage 2	40	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	882	988	1524	-	-
Stage 1	949	-	-	-	-
Stage 2	982	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	879	988	1524	-	-
Mov Cap-2 Maneuver	879	-	-	-	-
Stage 1	946	-	-	-	-
Stage 2	982	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1524	-	920	-	-
HCM Lane V/C Ratio	0.003	-	0.012	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

Intersection

Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	1	4	4	87	24	4
Future Vol, veh/h	1	4	4	87	24	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	4	4	97	27	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	134	29	31	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	860	1046	1582	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	857	1046	1582	-	-	-
Mov Cap-2 Maneuver	857	-	-	-	-	-
Stage 1	991	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1582	-	1002	-	-
HCM Lane V/C Ratio	0.003	-	0.006	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

Intersection

Int Delay, s/veh

1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	7	4	4	34	75	3
Future Vol, veh/h	7	4	4	34	75	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	4	38	83	3

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	131	85	86	0	-	0
Stage 1	85	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	863	974	1510	-	-	-
Stage 1	938	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	860	974	1510	-	-	-
Mov Cap-2 Maneuver	860	-	-	-	-	-
Stage 1	935	-	-	-	-	-
Stage 2	976	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1510	-	898	-	-
HCM Lane V/C Ratio	0.003	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Intersection

Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	1	4	4	92	26	4
Future Vol, veh/h	1	4	4	92	26	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	4	4	102	29	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	141	31	33	0	-	0
Stage 1	31	-	-	-	-	-
Stage 2	110	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	852	1043	1579	-	-	-
Stage 1	992	-	-	-	-	-
Stage 2	915	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	849	1043	1579	-	-	-
Mov Cap-2 Maneuver	849	-	-	-	-	-
Stage 1	989	-	-	-	-	-
Stage 2	915	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1579	-	997	-	-
HCM Lane V/C Ratio	0.003	-	0.006	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Intersection

Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	7	4	4	36	80	4
Future Vol, veh/h	7	4	4	36	80	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	8	4	4	40	89	4

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	139	91	93	0	0
Stage 1	91	-	-	-	-
Stage 2	48	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	854	967	1501	-	-
Stage 1	933	-	-	-	-
Stage 2	974	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	851	967	1501	-	-
Mov Cap-2 Maneuver	851	-	-	-	-
Stage 1	930	-	-	-	-
Stage 2	974	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1501	-	890	-	-
HCM Lane V/C Ratio	0.003	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-



HCM 6th TWSC  
3: Smith Road & Dezola Street

Combined (2024) AM - Phase 1  
06/28/2019

Intersection

Int Delay, s/veh	5.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	Y			↑	↑	
Traffic Vol, veh/h	167	4	4	87	24	54
Future Vol, veh/h	167	4	4	87	24	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	4	4	97	27	60

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	162	57	87	0	0
Stage 1	57	-	-	-	-
Stage 2	105	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	829	1009	1509	-	-
Stage 1	966	-	-	-	-
Stage 2	919	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	827	1009	1509	-	-
Mov Cap-2 Maneuver	827	-	-	-	-
Stage 1	963	-	-	-	-
Stage 2	919	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1509	-	831	-	-
HCM Lane V/C Ratio	0.003	-	0.229	-	-
HCM Control Delay (s)	7.4	0	10.6	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

HCM 6th TWSC  
3: Smith Road & Dezola Street

Combined (2024) PM - Phase 1  
06/28/2019

Intersection

Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	
Traffic Vol, veh/h	112	4	4	34	75	185
Future Vol, veh/h	112	4	4	34	75	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	124	4	4	38	83	206

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	232	186	289	0	-	0
Stage 1	186	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	756	856	1273	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	976	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	754	856	1273	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	843	-	-	-	-	-
Stage 2	976	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.7	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1273	-	757	-	-
HCM Lane V/C Ratio	0.003	-	0.17	-	-
HCM Control Delay (s)	7.8	0	10.7	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.6	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Combined (2024) AM - Phase 1 - with Improvements

06/28/2019

Intersection

Int Delay, s/veh	5.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	U
Traffic Vol, veh/h	167	4	4	87	24	54
Future Vol, veh/h	167	4	4	87	24	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	186	4	4	97	27	60

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	132	27	87	0	-	0
Stage 1	27	-	-	-	-	-
Stage 2	105	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	862	1048	1509	-	-	-
Stage 1	996	-	-	-	-	-
Stage 2	919	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	859	1048	1509	-	-	-
Mov Cap-2 Maneuver	859	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	919	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0.3	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1509	-	863	-	-
HCM Lane V/C Ratio	0.003	-	0.22	-	-
HCM Control Delay (s)	7.4	0	10.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.8	-	-

Intersection

Int Delay, s/veh	2.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	W
Traffic Vol, veh/h	112	4	4	34	75	185
Future Vol, veh/h	112	4	4	34	75	185
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	124	4	4	38	83	206

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	129	83	289	0	0
Stage 1	83	-	-	-	-
Stage 2	46	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	865	976	1273	-	-
Stage 1	940	-	-	-	-
Stage 2	976	-	-	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	862	976	1273	-	-
Mov Cap-2 Maneuver	862	-	-	-	-
Stage 1	937	-	-	-	-
Stage 2	976	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	0.8	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1273	-	865	-	-
HCM Lane V/C Ratio	0.003	-	0.149	-	-
HCM Control Delay (s)	7.8	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

Intersection

Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			↑	↑	
Traffic Vol, veh/h	37	4	4	92	26	15
Future Vol, veh/h	37	4	4	92	26	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	4	4	102	29	17

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	148	38	46	0	0
Stage 1	38	-	-	-	-
Stage 2	110	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	844	1034	1562	-	-
Stage 1	984	-	-	-	-
Stage 2	915	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	841	1034	1562	-	-
Mov Cap-2 Maneuver	841	-	-	-	-
Stage 1	981	-	-	-	-
Stage 2	915	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	857	-	-
HCM Lane V/C Ratio	0.003	-	0.053	-	-
HCM Control Delay (s)	7.3	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			W	W	
Traffic Vol, veh/h	32	4	4	36	80	40
Future Vol, veh/h	32	4	4	36	80	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	4	4	40	89	44

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	159	111	133	0	-	0
Stage 1	111	-	-	-	-	-
Stage 2	48	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	832	942	1452	-	-	-
Stage 1	914	-	-	-	-	-
Stage 2	974	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	830	942	1452	-	-	-
Mov Cap-2 Maneuver	830	-	-	-	-	-
Stage 1	911	-	-	-	-	-
Stage 2	974	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1452	-	841	-	-
HCM Lane V/C Ratio	0.003	-	0.048	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout - with Improvements

06/28/2019

Intersection

Int Delay, s/veh	2.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	W
Traffic Vol, veh/h	37	4	4	92	26	15
Future Vol, veh/h	37	4	4	92	26	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	4	4	102	29	17

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	139	29	46	0	0
Stage 1	29	-	-	-	-
Stage 2	110	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	854	1046	1562	-	-
Stage 1	994	-	-	-	-
Stage 2	915	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	851	1046	1562	-	-
Mov Cap-2 Maneuver	851	-	-	-	-
Stage 1	991	-	-	-	-
Stage 2	915	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	867	-	-
HCM Lane V/C Ratio	0.003	-	0.053	-	-
HCM Control Delay (s)	7.3	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

3: Smith Road & Dezola Street  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout - with Improvements

06/28/2019

Intersection

Int Delay, s/veh	1.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	W			U	U	U
Traffic Vol, veh/h	32	4	4	36	80	40
Future Vol, veh/h	32	4	4	36	80	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	75
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	4	4	40	89	44

Major/Minor	Minor2	Major1		Major2	
Conflicting Flow All	137	89	133	0	0
Stage 1	89	-	-	-	-
Stage 2	48	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-
Pot Cap-1 Maneuver	856	969	1452	-	-
Stage 1	934	-	-	-	-
Stage 2	974	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	853	969	1452	-	-
Mov Cap-2 Maneuver	853	-	-	-	-
Stage 1	931	-	-	-	-
Stage 2	974	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	0.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1452	-	864	-	-
HCM Lane V/C Ratio	0.003	-	0.046	-	-
HCM Control Delay (s)	7.5	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-



# **APPENDIX I**

**CAPACITY ANALYSIS CALCULATIONS**

**E. WILLIAMS STREET**

**&**

**STRAYWHITE AVENUE**

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

Intersection

Int Delay, s/veh	5.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑	↗	↘	↑↑
Traffic Vol, veh/h	32	73	1428	8	20	360
Future Vol, veh/h	32	73	1428	8	20	360
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	81	1587	9	22	400

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1831	1587	0	0	1596
Stage 1	1587	-	-	-	-
Stage 2	244	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	75	132	-	-	409
Stage 1	184	-	-	-	-
Stage 2	775	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	71	132	-	-	409
Mov Cap-2 Maneuver	153	-	-	-	-
Stage 1	184	-	-	-	-
Stage 2	733	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	101.8	0	0.8
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	138	409
HCM Lane V/C Ratio	-	-	0.845	0.054
HCM Control Delay (s)	-	-	101.8	14.3
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	5.4	0.2

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Existing (2019) PM  
06/28/2019

Intersection

Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		↑	↑	↓	↑↑
Traffic Vol, veh/h	18	41	592	33	77	1418
Future Vol, veh/h	18	41	592	33	77	1418
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	20	46	658	37	86	1576

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1618	658	0	0	695
Stage 1	658	-	-	-	-
Stage 2	960	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	103	463	-	-	899
Stage 1	514	-	-	-	-
Stage 2	333	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	93	463	-	-	899
Mov Cap-2 Maneuver	212	-	-	-	-
Stage 1	514	-	-	-	-
Stage 2	301	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.1	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	340	899
HCM Lane V/C Ratio	-	-	0.193	0.095
HCM Control Delay (s)	-	-	18.1	9.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.7	0.3

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Background (2024) AM  
06/28/2019

Intersection

Int Delay, s/veh	16.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	37	85	1672	9	23	421
Future Vol, veh/h	37	85	1672	9	23	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	41	94	1858	10	26	468

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2144	1858	0	0	1868
Stage 1	1858	-	-	-	-
Stage 2	286	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	47	~ 91	-	-	320
Stage 1	135	-	-	-	-
Stage 2	738	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	43	~ 91	-	-	320
Mov Cap-2 Maneuver	113	-	-	-	-
Stage 1	135	-	-	-	-
Stage 2	678	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 308.6	0	0.9
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	97	320
HCM Lane V/C Ratio	-	-	1.397	0.08
HCM Control Delay (s)	-	-	\$ 308.6	17.2
HCM Lane LOS	-	-	F	C
HCM 95th %tile Q(veh)	-	-	9.9	0.3

Notes

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

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Background (2024) PM  
06/28/2019

Intersection

Int Delay, s/veh	1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑	↗	↘	↑↑
Traffic Vol, veh/h	21	48	773	38	89	1664
Future Vol, veh/h	21	48	773	38	89	1664
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	23	53	859	42	99	1849

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	1982	859	0	0	901
Stage 1	859	-	-	-	-
Stage 2	1123	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	60	355	-	-	752
Stage 1	414	-	-	-	-
Stage 2	273	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	52	355	-	-	752
Mov Cap-2 Maneuver	159	-	-	-	-
Stage 1	414	-	-	-	-
Stage 2	237	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.7	0	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	258	752
HCM Lane V/C Ratio	-	-	0.297	0.132
HCM Control Delay (s)	-	-	24.7	10.5
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	1.2	0.5

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Intersection

Int Delay, s/veh	25					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘		↑	↗	↘	↑↑
Traffic Vol, veh/h	39	90	1773	10	25	447
Future Vol, veh/h	39	90	1773	10	25	447
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	100	1970	11	28	497

Major/Minor	Minor1	Major1	Major2	Major3	Major4	Major5
Conflicting Flow All	2275	1970	0	0	1981	0
Stage 1	1970	-	-	-	-	-
Stage 2	305	-	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13	-
Critical Hdwy Stg 1	5.43	-	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219	-
Pot Cap-1 Maneuver	~ 39	~ 78	-	-	289	-
Stage 1	118	-	-	-	-	-
Stage 2	722	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	~ 35	~ 78	-	-	289	-
Mov Cap-2 Maneuver	99	-	-	-	-	-
Stage 1	118	-	-	-	-	-
Stage 2	652	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 457.8	0	1
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	83	289
HCM Lane V/C Ratio	-	-	1.727	0.096
HCM Control Delay (s)	-	-	\$ 457.8	18.8
HCM Lane LOS	-	-	F	C
HCM 95th %tile Q(veh)	-	-	12	0.3

Notes

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

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Intersection

Int Delay, s/veh	1.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑	↗	↘	↑↑
Traffic Vol, veh/h	22	50	815	41	95	1764
Future Vol, veh/h	22	50	815	41	95	1764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	56	906	46	106	1960

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2098	906	0	0	952
Stage 1	906	-	-	-	-
Stage 2	1192	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	51	334	-	-	720
Stage 1	393	-	-	-	-
Stage 2	251	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	44	334	-	-	720
Mov Cap-2 Maneuver	145	-	-	-	-
Stage 1	393	-	-	-	-
Stage 2	214	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	27.5	0	0.6
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	239	720
HCM Lane V/C Ratio	-	-	0.335	0.147
HCM Control Delay (s)	-	-	27.5	10.9
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	1.4	0.5

HCM 6th TWSC  
 4: E. Williams Street & Straywhite Avenue

Combined (2024) AM - Phase 1  
 06/28/2019

Intersection						
Int Delay, s/veh	36.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑	↗	↘	↑↑
Traffic Vol, veh/h	47	116	1672	12	33	421
Future Vol, veh/h	47	116	1672	12	33	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	129	1858	13	37	468

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2166	1858	0	0	1871
Stage 1	1858	-	-	-	-
Stage 2	308	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	~ 46	~ 91	-	-	320
Stage 1	135	-	-	-	-
Stage 2	719	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	~ 41	~ 91	-	-	320
Mov Cap-2 Maneuver	112	-	-	-	-
Stage 1	135	-	-	-	-
Stage 2	636	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	\$ 509.6	0	1.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	96	320
HCM Lane V/C Ratio	-	-	1.887	0.115
HCM Control Delay (s)	-	-	\$ 509.6	17.7
HCM Lane LOS	-	-	F	C
HCM 95th %tile Q(veh)	-	-	15.1	0.4

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



HCM 6th TWSC  
 4: E. Williams Street & Straywhite Avenue

Combined (2024) PM - Phase 1  
 06/28/2019

Intersection						
Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘↗		↑	↗	↘	↑↑
Traffic Vol, veh/h	28	68	773	49	123	1664
Future Vol, veh/h	28	68	773	49	123	1664
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	76	859	54	137	1849

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2058	859	0	0	913
Stage 1	859	-	-	-	-
Stage 2	1199	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	54	355	-	-	744
Stage 1	414	-	-	-	-
Stage 2	249	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	44	355	-	-	744
Mov Cap-2 Maneuver	142	-	-	-	-
Stage 1	414	-	-	-	-
Stage 2	203	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	30.2	0	0.8
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	247	744
HCM Lane V/C Ratio	-	-	0.432	0.184
HCM Control Delay (s)	-	-	30.2	10.9
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	2	0.7

4: E. Williams Street & Straywhite Avenue Combined (2024) AM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

07/01/2019

Intersection

Int Delay, s/veh	17.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↑	↗	↙	↑↑
Traffic Vol, veh/h	47	116	1672	12	33	421
Future Vol, veh/h	47	116	1672	12	33	421
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	52	129	1858	13	37	468

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2166	1858	0	0	1871
Stage 1	1858	-	-	-	-
Stage 2	308	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	~ 46	~ 91	-	-	320
Stage 1	135	-	-	-	-
Stage 2	719	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	~ 41	~ 91	-	-	320
Mov Cap-2 Maneuver	112	-	-	-	-
Stage 1	135	-	-	-	-
Stage 2	636	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	247.6	0	1.3
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	112	91	320	-
HCM Lane V/C Ratio	-	-	0.466	1.416	0.115	-
HCM Control Delay (s)	-	-	62.5	322.6	17.7	-
HCM Lane LOS	-	-	F	F	C	-
HCM 95th %tile Q(veh)	-	-	2.1	9.7	0.4	-

Notes

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

4: E. Williams Street & Straywhite Avenue Combined (2024) PM - Phase 1 - with Improvements  
 Horton Park - Apex, NC

07/01/2019

Intersection

Int Delay, s/veh	1.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↑	↗	↙	↑↑
Traffic Vol, veh/h	28	68	773	49	123	1664
Future Vol, veh/h	28	68	773	49	123	1664
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	76	859	54	137	1849

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2058	859	0	0	913
Stage 1	859	-	-	-	-
Stage 2	1199	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	54	355	-	-	744
Stage 1	414	-	-	-	-
Stage 2	249	-	-	-	-
Platoon blocked, %					
Mov Cap-1 Maneuver	44	355	-	-	744
Mov Cap-2 Maneuver	142	-	-	-	-
Stage 1	414	-	-	-	-
Stage 2	203	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.6	0	0.8
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	142	355	744	-
HCM Lane V/C Ratio	-	-	0.219	0.213	0.184	-
HCM Control Delay (s)	-	-	37.3	17.9	10.9	-
HCM Lane LOS	-	-	E	C	B	-
HCM 95th %tile Q(veh)	-	-	0.8	0.8	0.7	-

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	43.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘		↑	↑	↘	↑↑
Traffic Vol, veh/h	57	107	1773	15	31	447
Future Vol, veh/h	57	107	1773	15	31	447
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	119	1970	17	34	497

Major/Minor	Minor1	Major1	Major2	Major2	Major2
Conflicting Flow All	2287	1970	0	0	1987
Stage 1	1970	-	-	-	-
Stage 2	317	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	~ 38	~ 78	-	-	288
Stage 1	118	-	-	-	-
Stage 2	712	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	~ 34	~ 78	-	-	288
Mov Cap-2 Maneuver	98	-	-	-	-
Stage 1	118	-	-	-	-
Stage 2	628	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	644.2	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	84	288
HCM Lane V/C Ratio	-	-	2.169	0.12
HCM Control Delay (s)	-	-	644.2	19.2
HCM Lane LOS	-	-	F	C
HCM 95th %tile Q(veh)	-	-	16.4	0.4

Notes

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

4: E. Williams Street & Straywhite Avenue  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout

06/28/2019

Intersection

Int Delay, s/veh	1.6					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W	W	T	T	T	T
Traffic Vol, veh/h	32	60	815	58	113	1764
Future Vol, veh/h	32	60	815	58	113	1764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	67	906	64	126	1960

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2138	906	0	0	970
Stage 1	906	-	-	-	-
Stage 2	1232	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	48	334	-	-	708
Stage 1	393	-	-	-	-
Stage 2	239	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	39	334	-	-	708
Mov Cap-2 Maneuver	135	-	-	-	-
Stage 1	393	-	-	-	-
Stage 2	196	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34.6	0	0.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	221	708
HCM Lane V/C Ratio	-	-	0.463	0.177
HCM Control Delay (s)	-	-	34.6	11.2
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	2.2	0.6

4: E. Williams Street & Straywhite Avenue Combined (2026) AM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

07/01/2019

Intersection

Int Delay, s/veh	19.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙	↗	↑	↗	↙	↑↑
Traffic Vol, veh/h	57	107	1773	15	31	447
Future Vol, veh/h	57	107	1773	15	31	447
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	63	119	1970	17	34	497

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2287	1970	0	0	1987
Stage 1	1970	-	-	-	-
Stage 2	317	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	~ 38	~ 78	-	-	288
Stage 1	118	-	-	-	-
Stage 2	712	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	~ 34	~ 78	-	-	288
Mov Cap-2 Maneuver	98	-	-	-	-
Stage 1	118	-	-	-	-
Stage 2	628	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	281.8	0	1.2
HCM LOS	F		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	98	78	288	-
HCM Lane V/C Ratio	-	-	0.646	1.524	0.12	-
HCM Control Delay (s)	-	-	92.6	382.6	19.2	-
HCM Lane LOS	-	-	F	F	C	-
HCM 95th %tile Q(veh)	-	-	3.2	9.7	0.4	-

Notes

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

4: E. Williams Street & Straywhite Avenue Combined (2026) PM - Full Buildout - with Improvements  
 Horton Park - Apex, NC

07/01/2019

Intersection

Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑	↗	↘	↑↑
Traffic Vol, veh/h	32	60	815	58	113	1764
Future Vol, veh/h	32	60	815	58	113	1764
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	200	-	75	100	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	67	906	64	126	1960

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	2138	906	0	0	970
Stage 1	906	-	-	-	-
Stage 2	1232	-	-	-	-
Critical Hdwy	6.63	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.83	-	-	-	-
Follow-up Hdwy	3.519	3.319	-	-	2.219
Pot Cap-1 Maneuver	48	334	-	-	708
Stage 1	393	-	-	-	-
Stage 2	239	-	-	-	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	39	334	-	-	708
Mov Cap-2 Maneuver	135	-	-	-	-
Stage 1	393	-	-	-	-
Stage 2	196	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	26.2	0	0.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	135	334	708
HCM Lane V/C Ratio	-	-	0.263	0.2	0.177
HCM Control Delay (s)	-	-	40.9	18.4	11.2
HCM Lane LOS	-	-	E	C	B
HCM 95th %tile Q(veh)	-	-	1	0.7	0.6

# **APPENDIX J**

**CAPACITY ANALYSIS CALCULATIONS**

**TEN-TEN ROAD**

**&**

**JESSIE DRIVE**



6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Existing (2019) AM  
06/28/2019

Intersection

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	↙
Traffic Vol, veh/h	541	3	4	1175	2	12
Future Vol, veh/h	541	3	4	1175	2	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	601	3	4	1306	2	13

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	604	0	1917 603
Stage 1	-	-	-	-	603 -
Stage 2	-	-	-	-	1314 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	974	-	74 499
Stage 1	-	-	-	-	546 -
Stage 2	-	-	-	-	251 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	974	-	73 499
Mov Cap-2 Maneuver	-	-	-	-	73 -
Stage 1	-	-	-	-	546 -
Stage 2	-	-	-	-	247 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0	19
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	272	-	-	974	-
HCM Lane V/C Ratio	0.057	-	-	0.005	-
HCM Control Delay (s)	19	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Intersection

Int Delay, s/veh	0.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↖			↗	↘	↙
Traffic Vol, veh/h	1221	12	8	795	3	4
Future Vol, veh/h	1221	12	8	795	3	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1357	13	9	883	3	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	1370	0	2265 1364
Stage 1	-	-	-	-	1364 -
Stage 2	-	-	-	-	901 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	501	-	45 181
Stage 1	-	-	-	-	238 -
Stage 2	-	-	-	-	396 -
Platoon blocked, %	-	-	-	-	- -
Mov Cap-1 Maneuver	-	-	501	-	43 181
Mov Cap-2 Maneuver	-	-	-	-	43 -
Stage 1	-	-	-	-	238 -
Stage 2	-	-	-	-	382 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	57.7
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	76	-	-	501	-
HCM Lane V/C Ratio	0.102	-	-	0.018	-
HCM Control Delay (s)	57.7	-	-	12.3	0
HCM Lane LOS	F	-	-	B	A
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-

6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Intersection

Int Delay, s/veh	1.7					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑	↓	↑
Traffic Vol, veh/h	623	46	47	1403	44	57
Future Vol, veh/h	623	46	47	1403	44	57
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	400	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	692	51	52	1559	49	63

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	743	0	1576
Stage 1	-	-	-	-	692
Stage 2	-	-	-	-	884
Critical Hdwy	-	-	5.34	-	6.29
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	3.12	-	3.67
Pot Cap-1 Maneuver	-	-	520	-	126
Stage 1	-	-	-	-	382
Stage 2	-	-	-	-	355
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	520	-	113
Mov Cap-2 Maneuver	-	-	-	-	113
Stage 1	-	-	-	-	382
Stage 2	-	-	-	-	320

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	32.7
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	555	-	-	520	-
HCM Lane V/C Ratio	0.433	0.114	-	-	0.1	-
HCM Control Delay (s)	59.2	12.3	-	-	12.7	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	1.9	0.4	-	-	0.3	-

Intersection

Int Delay, s/veh	10.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑	↓	↑
Traffic Vol, veh/h	1460	57	52	936	46	47
Future Vol, veh/h	1460	57	52	936	46	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	400	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1622	63	58	1040	51	52

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	1685	0	2258
Stage 1	-	-	-	-	1622
Stage 2	-	-	-	-	636
Critical Hdwy	-	-	5.34	-	6.29
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	3.12	-	3.67
Pot Cap-1 Maneuver	-	-	180	-	~ 49
Stage 1	-	-	-	-	101
Stage 2	-	-	-	-	475
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	180	-	~ 33
Mov Cap-2 Maneuver	-	-	-	-	~ 33
Stage 1	-	-	-	-	101
Stage 2	-	-	-	-	322

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	277.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	33	277	-	-	180	-
HCM Lane V/C Ratio	1.549	0.189	-	-	0.321	-
HCM Control Delay (s)	\$ 539.7	21	-	-	34.2	-
HCM Lane LOS	F	C	-	-	D	-
HCM 95th %tile Q(veh)	5.7	0.7	-	-	1.3	-

Notes

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

Intersection

Int Delay, s/veh 108.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑	↓	↑
Traffic Vol, veh/h	623	143	80	1403	260	97
Future Vol, veh/h	623	143	80	1403	260	97
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	400	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	692	159	89	1559	289	108

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	851	0	1650
Stage 1	-	-	-	-	692
Stage 2	-	-	-	-	958
Critical Hdwy	-	-	5.34	-	6.29
Critical Hdwy Stg 1	-	-	-	-	6.64
Critical Hdwy Stg 2	-	-	-	-	5.84
Follow-up Hdwy	-	-	3.12	-	3.67
Pot Cap-1 Maneuver	-	-	462	-	~ 113
Stage 1	-	-	-	-	382
Stage 2	-	-	-	-	325
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	462	-	~ 91
Mov Cap-2 Maneuver	-	-	-	-	~ 91
Stage 1	-	-	-	-	382
Stage 2	-	-	-	-	~ 262

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	\$ 788.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	91	555	-	-	462	-
HCM Lane V/C Ratio	3.175	0.194	-	-	0.192	-
HCM Control Delay (s)	\$ 1077.8	13	-	-	14.6	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	28.5	0.7	-	-	0.7	-

Notes

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

6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh 766.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑	↓	↑
Traffic Vol, veh/h	1460	281	95	936	202	90
Future Vol, veh/h	1460	281	95	936	202	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	400	-	0	200
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1622	312	106	1040	224	100

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1934
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	5.34	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	3.12	-
Pot Cap-1 Maneuver	-	135	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	135	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	8.4	\$ 8017.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	9	277	-	-	135	-
HCM Lane V/C Ratio	24.938	0.361	-	-	0.782	-
HCM Control Delay (s)	\$ 11579	25.2	-	-	91.2	-
HCM Lane LOS	F	D	-	-	F	-
HCM 95th %tile Q(veh)	29.8	1.6	-	-	4.7	-

Notes

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

6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout - with Improvements

06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↘	↑↑	↘	↑
Traffic Volume (vph)	623	143	80	1403	260	97
Future Volume (vph)	623	143	80	1403	260	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100	400		0	200
Storage Lanes		1	1		1	1
Taper Length (ft)			100		100	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Frnt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5085	1583	1770	3539	1770	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	35	
Link Distance (ft)	1089			1511	1690	
Travel Time (s)	16.5			22.9	32.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	692	159	89	1559	289	108
Shared Lane Traffic (%)						
Lane Group Flow (vph)	692	159	89	1559	289	108
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	16			16	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	2	8	1	6	8	1
Permitted Phases		2				8

6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout - with Improvements

06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	8	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	61.0	40.0	19.0	80.0	40.0	19.0
Total Split (%)	50.8%	33.3%	15.8%	66.7%	33.3%	15.8%
Maximum Green (s)	54.0	33.0	12.0	73.0	33.0	12.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead			Lead
Lead-Lag Optimize?	Yes		Yes			Yes
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None	None	Min	None	None
Act Effct Green (s)	31.2	58.4	12.0	48.6	21.9	39.3
Actuated g/C Ratio	0.38	0.72	0.15	0.60	0.27	0.48
v/c Ratio	0.35	0.14	0.34	0.74	0.61	0.14
Control Delay	18.2	3.5	41.6	14.4	34.4	15.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.2	3.5	41.6	14.4	34.4	15.0
LOS	B	A	D	B	C	B
Approach Delay	15.4			15.9	29.1	
Approach LOS	B			B	C	
Queue Length 50th (ft)	84	19	39	253	121	27
Queue Length 95th (ft)	145	37	117	467	277	83
Internal Link Dist (ft)	1009			1431	1610	
Turn Bay Length (ft)		100	400			200
Base Capacity (vph)	3716	1429	327	3134	818	823
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.11	0.27	0.50	0.35	0.13

Intersection Summary

Area Type: Other

Cycle Length: 120

Actuated Cycle Length: 81.2

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 17.6

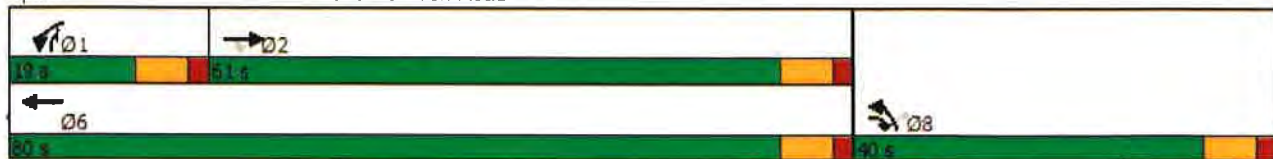
Intersection LOS: B

Intersection Capacity Utilization 61.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 6: Jessie Drive & Ten-Ten Road





6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout - with Improvements

06/28/2019

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↑	↑	↓	↑↑	↓	↑
Traffic Volume (vph)	1460	281	95	936	202	90
Future Volume (vph)	1460	281	95	936	202	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		100	400		0	200
Storage Lanes		1	1		1	1
Taper Length (ft)			100		100	
Lane Util. Factor	0.91	1.00	1.00	0.95	1.00	1.00
Frnt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	5085	1583	1770	3539	1770	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	5085	1583	1770	3539	1770	1583
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	45			45	35	
Link Distance (ft)	1089			1511	1690	
Travel Time (s)	16.5			22.9	32.9	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	1622	312	106	1040	224	100
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1622	312	106	1040	224	100
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	16			16	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pm+ov
Protected Phases	2	8	1	6	8	1
Permitted Phases		2				8

6: Jessie Drive & Ten-Ten Road  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout - with Improvements

06/28/2019

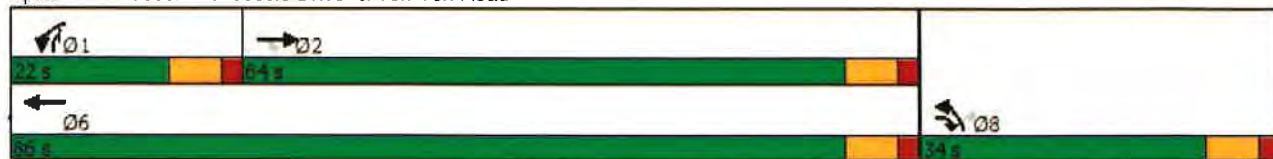
	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	8	1	6	8	1
Switch Phase						
Minimum Initial (s)	12.0	7.0	7.0	12.0	7.0	7.0
Minimum Split (s)	19.0	14.0	14.0	19.0	14.0	14.0
Total Split (s)	64.0	34.0	22.0	86.0	34.0	22.0
Total Split (%)	53.3%	28.3%	18.3%	71.7%	28.3%	18.3%
Maximum Green (s)	57.0	27.0	15.0	79.0	27.0	15.0
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag		Lead		Lead	
Lead-Lag Optimize?	Yes		Yes		Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	Min	None	None	Min	None	None
Act Effct Green (s)	43.0	67.9	13.1	61.4	19.6	37.9
Actuated g/C Ratio	0.47	0.74	0.14	0.67	0.21	0.41
v/c Ratio	0.68	0.27	0.42	0.44	0.59	0.15
Control Delay	20.8	4.4	45.7	7.9	41.5	19.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.8	4.4	45.7	7.9	41.5	19.3
LOS	C	A	D	A	D	B
Approach Delay	18.2		11.4		34.7	
Approach LOS	B		B		C	
Queue Length 50th (ft)	249	46	55	124	114	34
Queue Length 95th (ft)	385	84	134	218	233	84
Internal Link Dist (ft)	1009		1431		1610	
Turn Bay Length (ft)	100		400		200	
Base Capacity (vph)	3433	1361	344	3087	587	737
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.47	0.23	0.31	0.34	0.38	0.14

Intersection Summary

Area Type: Other  
 Cycle Length: 120  
 Actuated Cycle Length: 91.4  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.68  
 Intersection Signal Delay: 17.5  
 Intersection Capacity Utilization 57.7%  
 Analysis Period (min) 15

Intersection LOS: B  
 ICU Level of Service B

Splits and Phases: 6: Jessie Drive & Ten-Ten Road



# **APPENDIX K**

**CAPACITY ANALYSIS CALCULATIONS**













**JESSIE DRIVE EXTENSION**

**&**

**NC 55**

7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↗		↑↑	↗			
Traffic Volume (vph)	0	42	0	0	0	84	0	2888	42	0	0	0
Future Volume (vph)	0	42	0	0	0	84	0	2888	42	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0			150	0		0
Storage Lanes	0		0	0		1			1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			25	
Link Distance (ft)		152			4482			770			465	
Travel Time (s)		3.0			87.3			11.7			12.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	47	0	0	0	93	0	3209	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	0	93	0	3209	47	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2				1		2	1			
Detector Template		Thru				Right		Thru	Right			
Leading Detector (ft)		100				20		100	20			
Trailing Detector (ft)		0				0		0	0			
Detector 1 Position(ft)		0				0		0	0			
Detector 1 Size(ft)		6				20		6	20			
Detector 1 Type		CI+Ex				CI+Ex		CI+Ex	CI+Ex			
Detector 1 Channel												
Detector 1 Extend (s)		0.0				0.0		0.0	0.0			
Detector 1 Queue (s)		0.0				0.0		0.0	0.0			
Detector 1 Delay (s)		0.0				0.0		0.0	0.0			
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		CI+Ex						CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type		NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases						8			2			

7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Background (2026) AM  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		4				8		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		16.0				16.0		134.0	134.0			
Total Split (%)		10.7%				10.7%		89.3%	89.3%			
Maximum Green (s)		9.0				9.0		127.0	127.0			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0				3.0		3.0	3.0			
Recall Mode		None				None		Min	Min			
Act Effct Green (s)		10.6				11.0		129.0	129.0			
Actuated g/C Ratio		0.07				0.07		0.86	0.86			
v/c Ratio		0.36				0.79		1.05	0.03			
Control Delay		74.3				107.9		45.5	1.6			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		74.3				107.9		45.5	1.6			
LOS		E				F		D	A			
Approach Delay		74.3			107.9			44.8				
Approach LOS		E			F			D				
Queue Length 50th (ft)		45				91		~1801	5			
Queue Length 95th (ft)		89				#193		#1897	10			
Internal Link Dist (ft)		72			4402			690			385	
Turn Bay Length (ft)									150			
Base Capacity (vph)		136				118		3043	1361			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.35				0.79		1.05	0.03			

Intersection Summary

Area Type: Other  
 Cycle Length: 150  
 Actuated Cycle Length: 150  
 Natural Cycle: 150  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 1.05  
 Intersection Signal Delay: 47.0  
 Intersection Capacity Utilization 130.2%  
 Analysis Period (min) 15  
 Intersection LOS: D  
 ICU Level of Service H













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

Splits and Phases: 7: NC 55 & Jessie Drive Extension















7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↗		↑↑	↗			
Traffic Volume (vph)	0	42	0	0	0	84	0	1854	42	0	0	0
Future Volume (vph)	0	42	0	0	0	84	0	1854	42	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		150	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Frnt						0.865			0.850			
Flt Protected												
Satd. Flow (prot)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			25	
Link Distance (ft)		152			4482			770			465	
Travel Time (s)		3.0			87.3			11.7			12.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	47	0	0	0	93	0	2060	47	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	47	0	0	0	93	0	2060	47	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		0			0			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2				1		2	1			
Detector Template		Thru				Right		Thru	Right			
Leading Detector (ft)		100				20		100	20			
Trailing Detector (ft)		0				0		0	0			
Detector 1 Position(ft)		0				0		0	0			
Detector 1 Size(ft)		6				20		6	20			
Detector 1 Type		Cl+Ex				Cl+Ex		Cl+Ex	Cl+Ex			
Detector 1 Channel												
Detector 1 Extend (s)		0.0				0.0		0.0	0.0			
Detector 1 Queue (s)		0.0				0.0		0.0	0.0			
Detector 1 Delay (s)		0.0				0.0		0.0	0.0			
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		Cl+Ex						Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type		NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases						8			2			

7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		4				8		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		29.0				29.0		31.0	31.0			
Total Split (%)		48.3%				48.3%		51.7%	51.7%			
Maximum Green (s)		22.0				22.0		24.0	24.0			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0				3.0		3.0	3.0			
Recall Mode		None				None		Min	Min			
Act Effct Green (s)		10.2				10.3		34.2	34.2			
Actuated g/C Ratio		0.22				0.22		0.73	0.73			
v/c Ratio		0.12				0.26		0.80	0.04			
Control Delay		15.0				16.9		14.8	5.0			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		15.0				16.9		14.8	5.0			
LOS		B				B		B	A			
Approach Delay		15.0			16.9			14.6				
Approach LOS		B			B			B				
Queue Length 50th (ft)		10				21		~268	5			
Queue Length 95th (ft)		29				49		#487	17			
Internal Link Dist (ft)		72			4402			690			385	
Turn Bay Length (ft)									150			
Base Capacity (vph)		957				827		2584	1156			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.05				0.11		0.80	0.04			

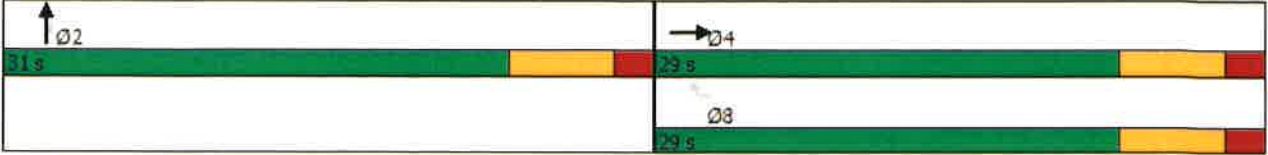
Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 46.8  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 14.7  
 Intersection Capacity Utilization 148.8%  
 Analysis Period (min) 15  
 Intersection LOS: B  
 ICU Level of Service H

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
















Splits and Phases: 7: NC 55 & Jessie Drive Extension



7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		↑				↗		↑↑	↗				
Traffic Volume (vph)	0	58	0	0	0	122	0	2888	52	0	0	0	
Future Volume (vph)	0	58	0	0	0	122	0	2888	52	0	0	0	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Storage Length (ft)	0		0	0		0	0		150	0		0	
Storage Lanes	0		0	0		1	0		1	0		0	
Taper Length (ft)	100			100			100			100			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00	
Friction						0.865			0.850				
Flt Protected													
Satd. Flow (prot)	0	1863	0	0	0	1611	0	3539	1583	0	0	0	
Flt Permitted													
Satd. Flow (perm)	0	1863	0	0	0	1611	0	3539	1583	0	0	0	
Right Turn on Red	No		No			No			No			No	
Satd. Flow (RTOR)													
Link Speed (mph)		35			35			45			25		
Link Distance (ft)		152			3684			770			465		
Travel Time (s)		3.0			71.8			11.7			12.7		
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
Adj. Flow (vph)	0	64	0	0	0	136	0	3209	58	0	0	0	
Shared Lane Traffic (%)													
Lane Group Flow (vph)	0	64	0	0	0	136	0	3209	58	0	0	0	
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right	
Median Width(ft)		12			12			12			12		
Link Offset(ft)		0			0			0			0		
Crosswalk Width(ft)		16			16			16			16		
Two way Left Turn Lane													
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15		9	15		9	15		9	15		9	
Number of Detectors		2				1		2	1				
Detector Template		Thru				Right		Thru	Right				
Leading Detector (ft)		100				20		100	20				
Trailing Detector (ft)		0				0		0	0				
Detector 1 Position(ft)		0				0		0	0				
Detector 1 Size(ft)		6				20		6	20				
Detector 1 Type		Cl+Ex				Cl+Ex		Cl+Ex	Cl+Ex				
Detector 1 Channel													
Detector 1 Extend (s)		0.0				0.0		0.0	0.0				
Detector 1 Queue (s)		0.0				0.0		0.0	0.0				
Detector 1 Delay (s)		0.0				0.0		0.0	0.0				
Detector 2 Position(ft)		94						94					
Detector 2 Size(ft)		6						6					
Detector 2 Type		Cl+Ex						Cl+Ex					
Detector 2 Channel													
Detector 2 Extend (s)		0.0						0.0					
Turn Type		NA				Perm		NA	Perm				
Protected Phases		4						2					
Permitted Phases						8			2				

7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		4				8		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		17.0				17.0		133.0	133.0			
Total Split (%)		11.3%				11.3%		88.7%	88.7%			
Maximum Green (s)		10.0				10.0		126.0	126.0			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0				3.0		3.0	3.0			
Recall Mode		None				None		Min	Min			
Act Effct Green (s)		11.4				12.0		128.0	128.0			
Actuated g/C Ratio		0.08				0.08		0.85	0.85			
v/c Ratio		0.45				1.06		1.06	0.04			
Control Delay		76.6				160.2		49.3	1.8			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		76.6				160.2		49.3	1.8			
LOS		E				F		D	A			
Approach Delay		76.6			160.2			48.4				
Approach LOS		E			F			D				
Queue Length 50th (ft)		61				~145		~1813	7			
Queue Length 95th (ft)		112				#289		#1910	13			
Internal Link Dist (ft)		72			3604			690			385	
Turn Bay Length (ft)									150			
Base Capacity (vph)		149				128		3019	1350			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.43				1.06		1.06	0.04			

Intersection Summary

Area Type: Other

Cycle Length: 150

Actuated Cycle Length: 150

Natural Cycle: 150

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.06

Intersection Signal Delay: 53.3

Intersection LOS: D

Intersection Capacity Utilization 132.4%

ICU Level of Service H

Analysis Period (min) 15

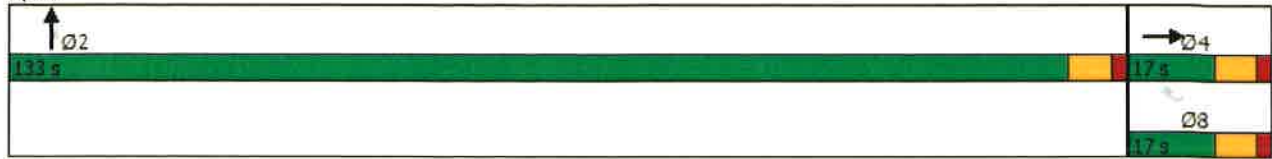
~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.













Splits and Phases: 7: NC 55 & Jessie Drive Extension



7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC













Combined (2026) PM - Full Buildout

06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↗		↑↑	↗			
Traffic Volume (vph)	0	64	0	0	0	118	0	1854	61	0	0	0
Future Volume (vph)	0	64	0	0	0	118	0	1854	61	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	0		150	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	1.00	1.00
Flt Protected						0.865			0.850			
Satd. Flow (prot)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1863	0	0	0	1611	0	3539	1583	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			25	
Link Distance (ft)		152			3684			770			465	
Travel Time (s)		3.0			71.8			11.7			12.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	71	0	0	0	131	0	2060	68	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	71	0	0	0	131	0	2060	68	0	0	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors		2				1		2	1			
Detector Template		Thru				Right		Thru	Right			
Leading Detector (ft)		100				20		100	20			
Trailing Detector (ft)		0				0		0	0			
Detector 1 Position(ft)		0				0		0	0			
Detector 1 Size(ft)		6				20		6	20			
Detector 1 Type		CI+Ex				CI+Ex		CI+Ex	CI+Ex			
Detector 1 Channel												
Detector 1 Extend (s)		0.0				0.0		0.0	0.0			
Detector 1 Queue (s)		0.0				0.0		0.0	0.0			
Detector 1 Delay (s)		0.0				0.0		0.0	0.0			
Detector 2 Position(ft)		94						94				
Detector 2 Size(ft)		6						6				
Detector 2 Type		CI+Ex						CI+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0						0.0				
Turn Type		NA				Perm		NA	Perm			
Protected Phases		4						2				
Permitted Phases						8			2			

7: NC 55 & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase		4				8		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		29.0				29.0		31.0	31.0			
Total Split (%)		48.3%				48.3%		51.7%	51.7%			
Maximum Green (s)		22.0				22.0		24.0	24.0			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0				3.0		3.0	3.0			
Recall Mode		None				None		Min	Min			
Act Effct Green (s)		11.2				11.3		30.2	30.2			
Actuated g/C Ratio		0.24				0.24		0.63	0.63			
v/c Ratio		0.16				0.34		0.92	0.07			
Control Delay		15.0				17.5		22.4	6.0			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		15.0				17.5		22.4	6.0			
LOS		B				B		C	A			
Approach Delay		15.0			17.5			21.8				
Approach LOS		B			B			C				
Queue Length 50th (ft)		15				30		~340	7			
Queue Length 95th (ft)		39				65		#516	24			
Internal Link Dist (ft)		72			3604			690			385	
Turn Bay Length (ft)									150			
Base Capacity (vph)		941				813		2244	1003			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.08				0.16		0.92	0.07			

Intersection Summary

Area Type: Other  
 Cycle Length: 60  
 Actuated Cycle Length: 47.6  
 Natural Cycle: 60  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.92  
 Intersection Signal Delay: 21.4  
 Intersection Capacity Utilization 150.6%  
 Analysis Period (min) 15  
 ~ Volume exceeds capacity, queue is theoretically infinite.  
 Queue shown is maximum after two cycles.  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 7: NC 55 & Jessie Drive Extension



# **APPENDIX L**

**CAPACITY ANALYSIS CALCULATIONS**

**NORTHBOUND U-TURN**

**&**

**NC 55**



Intersection

Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘					↑↑
Traffic Vol, veh/h	42	0	0	0	0	1369
Future Vol, veh/h	42	0	0	0	0	1369
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	0	0	0	0	1521

Major/Minor	Minor1	Major2	
Conflicting Flow All	761	-	-
Stage 1	0	-	-
Stage 2	761	-	-
Critical Hdwy	6.84	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.52	-	-
Pot Cap-1 Maneuver	342	0	0
Stage 1	-	0	-
Stage 2	422	0	-
Platoon blocked, %			-
Mov Cap-1 Maneuver	342	-	-
Mov Cap-2 Maneuver	342	-	-
Stage 1	-	-	-
Stage 2	422	-	-

Approach	WB	SB
HCM Control Delay, s	17.2	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	342	-
HCM Lane V/C Ratio	0.136	-
HCM Control Delay (s)	17.2	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.5	-

10: NC 55 & NB U-Turn  
Horton Park - Apex, NC

Background (2026) PM  
06/28/2019

Intersection

Int Delay, s/veh	1.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘					↑↑
Traffic Vol, veh/h	42	0	0	0	0	3075
Future Vol, veh/h	42	0	0	0	0	3075
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	47	0	0	0	0	3417

Major/Minor	Minor1	Major2
Conflicting Flow All	1709	-
Stage 1	0	-
Stage 2	1709	-
Critical Hdwy	6.84	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.84	-
Follow-up Hdwy	3.52	-
Pot Cap-1 Maneuver	82	0
Stage 1	-	0
Stage 2	132	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	82	-
Mov Cap-2 Maneuver	82	-
Stage 1	-	-
Stage 2	132	-

Approach	WB	SB
HCM Control Delay, s	95.6	0
HCM LOS	F	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	82	-
HCM Lane V/C Ratio	0.569	-
HCM Control Delay (s)	95.6	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	2.5	-

Intersection

Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖					↗↗
Traffic Vol, veh/h	60	0	0	0	0	1385
Future Vol, veh/h	60	0	0	0	0	1385
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	67	0	0	0	0	1539

Major/Minor	Minor1		Major2	
Conflicting Flow All	770	-	-	-
Stage 1	0	-	-	-
Stage 2	770	-	-	-
Critical Hdwy	6.84	-	-	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-
Follow-up Hdwy	3.52	-	-	-
Pot Cap-1 Maneuver	337	0	0	-
Stage 1	-	0	0	-
Stage 2	417	0	0	-
Platoon blocked, %				
Mov Cap-1 Maneuver	337	-	-	-
Mov Cap-2 Maneuver	337	-	-	-
Stage 1	-	-	-	-
Stage 2	417	-	-	-

Approach	WB	SB
HCM Control Delay, s	18.3	0
HCM LOS	C	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	337	-
HCM Lane V/C Ratio	0.198	-
HCM Control Delay (s)	18.3	-
HCM Lane LOS	C	-
HCM 95th %tile Q(veh)	0.7	-

10: NC 55 & NB U-Turn  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	2.4					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↖					↑↑
Traffic Vol, veh/h	56	0	0	0	0	3097
Future Vol, veh/h	56	0	0	0	0	3097
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	16974	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	62	0	0	0	0	3441

Major/Minor	Minor1	Major2
Conflicting Flow All	1721	-
Stage 1	0	-
Stage 2	1721	-
Critical Hdwy	6.84	-
Critical Hdwy Stg 1	-	-
Critical Hdwy Stg 2	5.84	-
Follow-up Hdwy	3.52	-
Pot Cap-1 Maneuver	80	0
Stage 1	-	0
Stage 2	130	0
Platoon blocked, %	-	-
Mov Cap-1 Maneuver	80	-
Mov Cap-2 Maneuver	80	-
Stage 1	-	-
Stage 2	130	-

Approach	WB	SB
HCM Control Delay, s	135.1	0
HCM LOS	F	

Minor Lane/Major Mvmt	WBLn1	SBT
Capacity (veh/h)	80	-
HCM Lane V/C Ratio	0.778	-
HCM Control Delay (s)	135.1	-
HCM Lane LOS	F	-
HCM 95th %tile Q(veh)	3.8	-

# **APPENDIX M**

**CAPACITY ANALYSIS CALCULATIONS**

**JESSIE DRIVE**

**&**

**NORTH-SOUTH CONNECTOR**

11: N/S Connector Road & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Intersection												
Int Delay, s/veh	4.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↘		↙	↘			↕			↕	
Traffic Vol, veh/h	14	90	6	32	101	54	18	4	105	12	1	3
Future Vol, veh/h	14	90	6	32	101	54	18	4	105	12	1	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	100	7	36	112	60	20	4	117	13	1	3

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	172	0	0	107	0	0	352	380	104	410	353	142
Stage 1	-	-	-	-	-	-	136	136	-	214	214	-
Stage 2	-	-	-	-	-	-	216	244	-	196	139	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1405	-	-	1484	-	-	603	552	951	552	572	906
Stage 1	-	-	-	-	-	-	867	784	-	788	725	-
Stage 2	-	-	-	-	-	-	786	704	-	806	782	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1405	-	-	1484	-	-	584	533	951	468	552	906
Mov Cap-2 Maneuver	-	-	-	-	-	-	584	533	-	468	552	-
Stage 1	-	-	-	-	-	-	857	775	-	779	708	-
Stage 2	-	-	-	-	-	-	763	687	-	695	773	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	1.3	10	12.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	854	1405	-	-	1484	-	-	520
HCM Lane V/C Ratio	0.165	0.011	-	-	0.024	-	-	0.034
HCM Control Delay (s)	10	7.6	-	-	7.5	-	-	12.2
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0.1	-	-	0.1

Intersection

Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔			↔	↔
Traffic Vol, veh/h	5	102	18	106	94	20	10	1	62	54	4	14
Future Vol, veh/h	5	102	18	106	94	20	10	1	62	54	4	14
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	75	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	6	113	20	118	104	22	11	1	69	60	4	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	126	0	0	133	0	0	496	497	123	521	496	115
Stage 1	-	-	-	-	-	-	135	135	-	351	351	-
Stage 2	-	-	-	-	-	-	361	362	-	170	145	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1460	-	-	1452	-	-	484	475	928	466	475	937
Stage 1	-	-	-	-	-	-	868	785	-	666	632	-
Stage 2	-	-	-	-	-	-	657	625	-	832	777	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1460	-	-	1452	-	-	441	435	928	403	435	937
Mov Cap-2 Maneuver	-	-	-	-	-	-	441	435	-	403	435	-
Stage 1	-	-	-	-	-	-	865	782	-	663	581	-
Stage 2	-	-	-	-	-	-	589	574	-	766	774	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.3			3.7			10			14.6		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	795	1460	-	-	1452	-	-	455
HCM Lane V/C Ratio	0.102	0.004	-	-	0.081	-	-	0.176
HCM Control Delay (s)	10	7.5	-	-	7.7	-	-	14.6
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	0.3	-	-	0.6

# **APPENDIX N**

**CAPACITY ANALYSIS CALCULATIONS**

**JESSIE DRIVE**

**&**

**SITE DRIVE #1**



12: Site Drive #1 & Jessie Drive Extension/Jessie Drive Combined (2026) AM - Full Buildout  
 Horton Park - Apex, NC 06/28/2019

Intersection

Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	4	218	4	27	176	11	4	4	87	35	4	4
Future Vol, veh/h	4	218	4	27	176	11	4	4	87	35	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	242	4	30	196	12	4	4	97	39	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	208	0	0	246	0	0	518	520	244	565	516	202
Stage 1	-	-	-	-	-	-	252	252	-	262	262	-
Stage 2	-	-	-	-	-	-	266	268	-	303	254	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1363	-	-	1320	-	-	468	461	795	436	463	839
Stage 1	-	-	-	-	-	-	752	698	-	743	691	-
Stage 2	-	-	-	-	-	-	739	687	-	706	697	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1363	-	-	1320	-	-	453	449	795	373	451	839
Mov Cap-2 Maneuver	-	-	-	-	-	-	453	449	-	373	451	-
Stage 1	-	-	-	-	-	-	750	696	-	741	675	-
Stage 2	-	-	-	-	-	-	714	671	-	614	695	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	10.6	15.2
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	747	1363	-	-	1320	-	-	400
HCM Lane V/C Ratio	0.141	0.003	-	-	0.023	-	-	0.119
HCM Control Delay (s)	10.6	7.7	-	-	7.8	-	-	15.2
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.1	-	-	0.4

12: Site Drive #1 & Jessie Drive Extension/Jessie Drive Combined (2026) PM - Full Buildout  
 Horton Park - Apex, NC 06/28/2019

Intersection

Int Delay, s/veh	2.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↙	↘		↙	↘			↕			↕	
Traffic Vol, veh/h	4	210	4	88	228	35	4	4	52	21	4	4
Future Vol, veh/h	4	210	4	88	228	35	4	4	52	21	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	233	4	98	253	39	4	4	58	23	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	292	0	0	237	0	0	716	731	235	743	714	273
Stage 1	-	-	-	-	-	-	243	243	-	469	469	-
Stage 2	-	-	-	-	-	-	473	488	-	274	245	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1270	-	-	1330	-	-	345	349	804	331	357	766
Stage 1	-	-	-	-	-	-	761	705	-	575	561	-
Stage 2	-	-	-	-	-	-	572	550	-	732	703	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1270	-	-	1330	-	-	319	322	804	286	330	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	319	322	-	286	330	-
Stage 1	-	-	-	-	-	-	759	703	-	573	519	-
Stage 2	-	-	-	-	-	-	522	509	-	673	701	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	2	11	17.5
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	669	1270	-	-	1330	-	-	319
HCM Lane V/C Ratio	0.1	0.003	-	-	0.074	-	-	0.101
HCM Control Delay (s)	11	7.8	-	-	7.9	-	-	17.5
HCM Lane LOS	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.3	0	-	-	0.2	-	-	0.3

# **APPENDIX O**

**CAPACITY ANALYSIS CALCULATIONS**

**JESSIE DRIVE**

**&**

**SITE DRIVE #2**

13: Site Drive #2 & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) AM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh 1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗		↘	↑	↖	
Traffic Vol, veh/h	201	6	6	170	17	17
Future Vol, veh/h	201	6	6	170	17	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	223	7	7	189	19	19

Major/Minor	Major1	Major2	Minor1	Minor2	Minor3
Conflicting Flow All	0	0	230	0	430
Stage 1	-	-	-	-	227
Stage 2	-	-	-	-	203
Critical Hdwy	-	-	4.12	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	2.218	-	3.518
Pot Cap-1 Maneuver	-	-	1338	-	582
Stage 1	-	-	-	-	811
Stage 2	-	-	-	-	831
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1338	-	579
Mov Cap-2 Maneuver	-	-	-	-	579
Stage 1	-	-	-	-	811
Stage 2	-	-	-	-	827

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	676	-	-	1338	-
HCM Lane V/C Ratio	0.056	-	-	0.005	-
HCM Control Delay (s)	10.6	-	-	7.7	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0	-

13: Site Drive #2 & Jessie Drive Extension  
Horton Park - Apex, NC

Combined (2026) PM - Full Buildout  
06/28/2019

Intersection

Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↑	↔	
Traffic Vol, veh/h	200	18	18	210	10	10
Future Vol, veh/h	200	18	18	210	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	222	20	20	233	11	11

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	242	0	505 232
Stage 1	-	-	-	-	232 -
Stage 2	-	-	-	-	273 -
Critical Hdwy	-	-	4.12	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	2.218	-	3.518 3.318
Pot Cap-1 Maneuver	-	-	1324	-	527 807
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	773 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1324	-	519 807
Mov Cap-2 Maneuver	-	-	-	-	519 -
Stage 1	-	-	-	-	807 -
Stage 2	-	-	-	-	761 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.9
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	632	-	-	1324	-
HCM Lane V/C Ratio	0.035	-	-	0.015	-
HCM Control Delay (s)	10.9	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

**PLANNING BOARD REPORT TO TOWN COUNCIL**  
Rezoning #19CZ16 Horton Park PUD amendment & TF-CZ

October 14, 2019 Planning Board Meeting



**Report Requirements:**

Per NCGS 160A-387, all proposed amendments to the zoning ordinance or zoning map shall have a written report provided from the Planning Board to the Town Council within 30 days of referral of the amendment to the Planning Board, or the Town Council may proceed in its consideration of the amendment without the Planning Board report. Furthermore, in no case is the Town Council bound by the recommendations, if any, of the Planning Board.

Per NCGS 160A-383, the Planning Board shall advise and comment on whether the proposed zoning amendment is consistent with all applicable officially adopted plans, and provide a written recommendation to the Town Council that addresses plan consistency and other matters as deemed appropriate by the Planning Board, but a comment by the Planning Board that a proposed amendment is inconsistent with the officially adopted plans shall not preclude consideration or approval of the proposed amendment by the Town Council.

**PROJECT DESCRIPTION:**

- Acreage:** ±146.9 acres
- PINs:** 0751421387, 0751310079, 0751319308, 0750390993, 0751400194, 0750398682, 0750495371, 0750299342, 0750280998 (portion of), 0750270906, 0750274707, 0750278677, 0750278925
- Current Zoning:** Planned Unit Development-Conditional Zoning (PUD-CZ #18CZ04)
- Proposed Zoning:** Planned Unit Development-Conditional Zoning (PUD-CZ) and Tech/Flex-Conditional Zoning (TF-CZ)
- 2045 Land Use Map:** Medium Density Residential, High Density Residential, High Density Residential/Office Employment, Office Employment/Industrial Employment
- Town Limits:** ETJ

**Applicable Officially Adopted Plans:**

The Board must state whether the project is consistent or inconsistent with the following officially adopted plans, if applicable. Applicable plans have a check mark next to them.

2045 Land Use Map  
 Consistent                       Inconsistent                      Reason: \_\_\_\_\_

Apex Transportation Plan  
 Consistent                       Inconsistent                      Reason: \_\_\_\_\_

Parks, Recreation, Open Space, and Greenways Plan  
 Consistent                       Inconsistent                      Reason: \_\_\_\_\_



**Legislative Considerations:**

The applicant shall propose site-specific standards and conditions that take into account the following considerations, which are considerations that are relevant to the legislative determination of whether or not the proposed conditional zoning district rezoning request is in the public interest. These considerations do not exclude the legislative consideration of any other factor that is relevant to the public interest.

1. *Consistency with 2045 Land Use Plan.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and consistency with the purposes, goals, objectives, and policies of the 2045 Land Use Plan.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

2. *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.

Consistent                       Inconsistent                      Reason: Traffic impact

and safety concerns related to roads.

3. *Zoning district supplemental standards.* The proposed Conditional Zoning (CZ) District use's compliance with Sec. 4.4 *Supplemental Standards*, if applicable.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

4. *Design minimizes adverse impact.* The design of the proposed Conditional Zoning (CZ) District use's minimization of adverse effects, including visual impact of the proposed use on adjacent lands; and avoidance of significant adverse impacts on surrounding lands regarding trash, traffic, service delivery, parking and loading, odors, noise, glare, and vibration and not create a nuisance.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

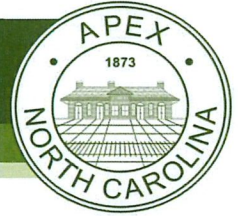
Traffic impact and safety concerns related to roads.

5. *Design minimizes environmental impact.* The proposed Conditional Zoning District use's minimization of environmental impacts and protection from significant deterioration of water and air resources, wildlife habitat, scenic resources, and other natural resources.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

PLANNING BOARD REPORT TO TOWN COUNCIL  
Rezoning #19CZ16 Horton Park PUD amendment & TF-CZ

October 14, 2019 Planning Board Meeting



6. *Impact on public facilities.* The proposed Conditional Zoning (CZ) District use's avoidance of having adverse impacts on public facilities and services, including roads, potable water and wastewater facilities, parks, schools, police, fire and EMS facilities.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

Traffic impact and safety concerns related to roads.

7. *Health, safety, and welfare.* The proposed Conditional Zoning (CZ) District use's effect on the health, safety, or welfare of the residents of the Town or its ETJ.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

Traffic impact and safety concerns related to roads.

8. *Detrimental to adjacent properties.* Whether the proposed Conditional Zoning (CZ) District use is substantially detrimental to adjacent properties.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

9. *Not constitute nuisance or hazard.* Whether the proposed Conditional Zoning (CZ) District use constitutes a nuisance or hazard due to traffic impact or noise, or because of the number of persons who will be using the Conditional Zoning (CZ) District use.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_

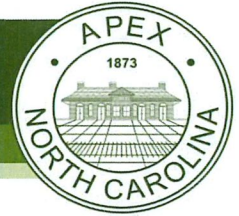
10. *Other relevant standards of this Ordinance.* Whether the proposed Conditional Zoning (CZ) District use complies with all standards imposed on it by all other applicable provisions of this Ordinance for use, layout, and general development characteristics.

Consistent                       Inconsistent                      Reason: \_\_\_\_\_



PLANNING BOARD REPORT TO TOWN COUNCIL  
Rezoning #19CZ16 Horton Park PUD amendment & TF-CZ

October 14, 2019 Planning Board Meeting



**Planning Board Recommendation:**

Motion: Recommend denial of rezoning amendment as submitted.  
Introduced by Planning Board member: Mark Steele  
Seconded by Planning Board member: Reginald Skinner

- Approval:* the project is consistent with all applicable officially adopted plans and the applicable legislative considerations listed above.
- Approval with conditions:* the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above, so the following conditions are recommended to be included in the project in order to make it fully consistent:  
  
\_\_\_\_\_  
  
\_\_\_\_\_  
  
\_\_\_\_\_

*Denial:* the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations noted above.

With 5 Planning Board Member(s) voting "aye"

With 0 Planning Board Member(s) voting "no"

Reasons for dissenting votes:  
  
\_\_\_\_\_  
  
\_\_\_\_\_

This report reflects the recommendation of the Planning Board, this the 14<sup>th</sup> day of October 2019.

Attest:

Margo J. Bills  
Margo Bills, Planning Board Chair

Dianne F. Khin  
Dianne Khin, Planning Director



**TOWN OF APEX**  
 POST OFFICE BOX 250  
 APEX, NORTH CAROLINA 27502  
 PHONE 919-249-3426

**PUBLIC NOTIFICATION  
 OF PUBLIC HEARINGS**

**CONDITIONAL ZONING #19CZ16  
 Horton Park PUD Amendment & TF-CZ**

Pursuant to the provisions of North Carolina Statutes Section 160A-364 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Planning Board and Town Council of the Town of Apex. The purpose of these hearings is to consider the following:

**Applicant:** MFW Investments, LLC

**Authorized Agent:** Jeff Roach, Peak Engineering & Design

**Property Addresses:** 5100, 5101, & 5220 Jessie Drive; 0 Dezola Street; and  
 8140 (portion of), 8252, 8306 & 8308 Smith Road

**Acreage:** ±146.9 Acres (total)

**Property Identification Numbers (PINs):** 0751421387, 0751310079, 0751319308, 0750390993, 0751400194, 0750398682, 0750495371, 0750299342, 0750280998 (portion of), 0750270906, 0750274707, 0750278677, 0750278925

**Existing 2045 Land Use Map Designations:**

Within proposed PUD-CZ area (127.84 acres): Medium Density Residential, High Density Residential,  
 High Density Residential/Office Employment

Within proposed TF-CZ area (19.06 acres): Office Employment/Industrial Employment

**Existing Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ #18CZ04)

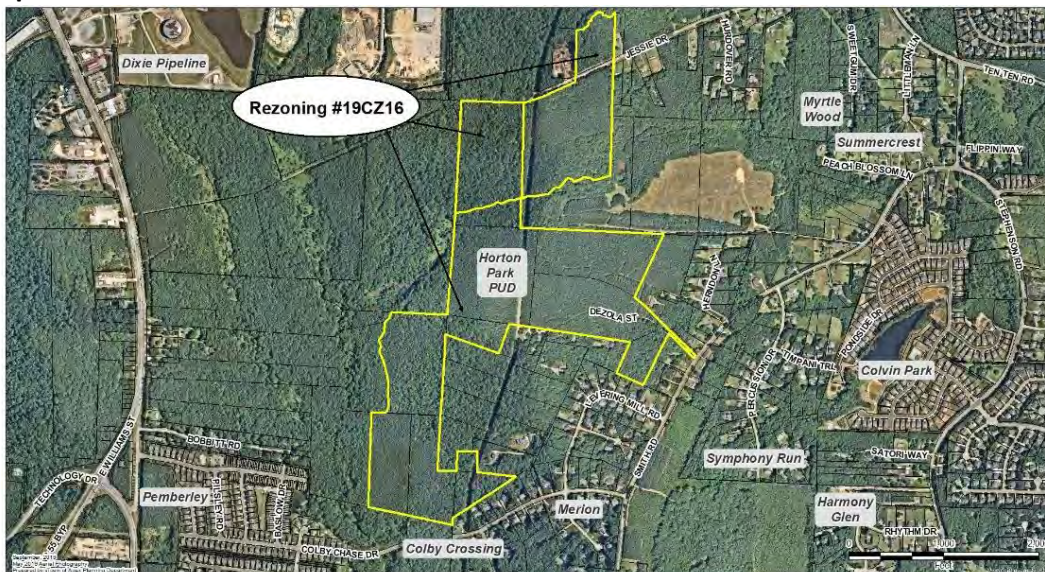
**Proposed Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ) &  
 Tech/Flex-Conditional Zoning (TF-CZ)

**Public Hearing Location:** Apex Town Hall  
 73 Hunter Street, Apex, North Carolina  
 Council Chambers, 2<sup>nd</sup> Floor

**Planning Board Public Hearing Date and Time:** October 14, 2019 4:30 P.M.

**Town Council Public Hearing Date and Time:** October 15, 2019 7:00 P.M.

**Vicinity Map:**



Property owners within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may appear at the public hearing and be heard with respect to the application. Maps showing the location for the above site(s) to be considered in addition to a copy of the [2045 Land Use Map](#) can be inspected at the Apex Town Hall or call 919-249-3426, Department of Planning and Community Development, for further information. To view the petition and related documents on-line: <https://www.apexnc.org/DocumentCenter/View/28218>.



**TOWN OF APEX**  
POST OFFICE BOX 230  
APEX, NORTH CAROLINA 27502  
PHONE 919-249-3426

**PUBLIC NOTIFICATION  
OF PUBLIC HEARINGS**

**CONDITIONAL ZONING #19CZ16  
Horton Park PUD Amendment & TF-CZ**

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**Acreage:** ±146.9 Acres (total)

**Property Identification Numbers (PINs):** 0751421387, 0751310079, 0751319308, 0750390993, 0751400194, 0750398682, 0750495371, 0750299342, 0750280998 (portion of), 0750270906, 0750274707, 0750278677, 0750278925

**Existing 2045 Land Use Map Designations:**

Within proposed PUD-CZ area (127.84 acres): Medium Density Residential, High Density Residential, High Density Residential/Office Employment

Within proposed TF-CZ area (19.06 acres): Office Employment/Industrial Employment

**Existing Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ #18C204)

**Proposed Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ) & Tech/Flex-Conditional Zoning (TF-CZ)

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73 Hunter Street, Apex, North Carolina  
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Published Dates: September 23-October 15, 2019

Dianne F. Khin, AICP  
Planning Director



**TOWN OF APEX**  
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 APEX, NORTH CAROLINA 27502  
 PHONE 919-249-3426

**PUBLIC NOTIFICATION  
 OF PUBLIC HEARINGS**

**CONDITIONAL ZONING #19CZ16  
 Horton Park PUD Amendment & TF-CZ**

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 High Density Residential/Office Employment

Within proposed TF-CZ area (19.06 acres): Office Employment/Industrial Employment

**Existing Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ #18CZ04)

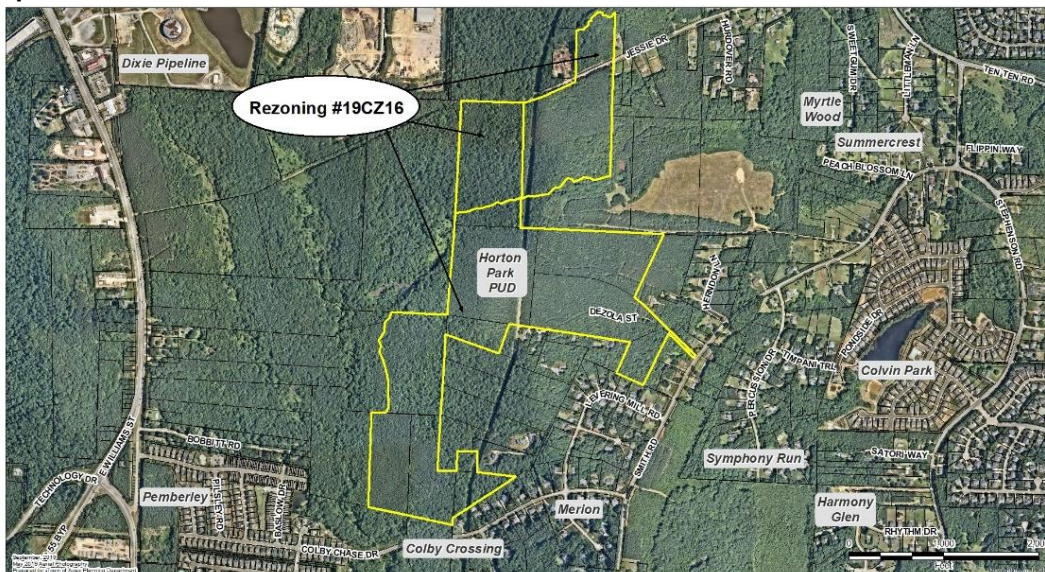
**Proposed Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ) &  
 Tech/Flex-Conditional Zoning (TF-CZ)

**Public Hearing Location:** Apex Town Hall  
 73 Hunter Street, Apex, North Carolina  
 Council Chambers, 2<sup>nd</sup> Floor

**Planning Board Public Hearing Date and Time:** **October 14, 2019 4:30 P.M.**

**Town Council Public Hearing Date and Time:** **October 15, 2019 November 6, 2019 7:00 P.M.**

**Vicinity Map:**



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 POST OFFICE BOX 230  
 APEX, NORTH CAROLINA 27502  
 PHONE 919-249-3426

**PUBLIC NOTIFICATION  
 OF PUBLIC HEARINGS**

**CONDITIONAL ZONING #19CZ16  
 Horton Park PUD Amendment & TF-CZ**

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**Existing Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ #18CZ04)

**Proposed Zoning of Properties:** Planned Unit Development-Conditional Zoning (PUD-CZ) & Tech/Flex-Conditional Zoning (TF-CZ)

**Public Hearing Location:** Apex Town Hall  
 73 Hunter Street, Apex, North Carolina  
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**Vicinity Map:**



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Published Dates: September 23-~~October 15~~ November 6, 2019

Dianne F. Khin, AICP  
 Planning Director



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 APEX, NORTH CAROLINA 27502  
 PHONE 919-249-3426

**AFFIDAVIT CERTIFYING**  
**Public Notification – Written (Mailed) Notice**  
 Section 2.2.11  
 Town of Apex Unified Development Ordinance

Project Number and/or Name: Conditional Rezoning #19CZ16  
 Project Location: 5100, 5101, & 5220 Jessie Drive; 0 Dezola Street; and 8140 (portion of), 8252, 8306 & 8308 Smith Road  
 Applicant or Authorized Agent: Jeff Roach  
 Firm: Peak Engineering & Design

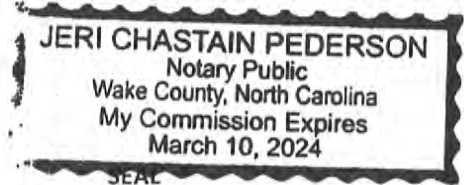
This is to certify that I as Planning Director, mailed or caused to have mailed by first class postage for the above mentioned project on September 23, 2019, a notice containing the time and place, location, nature and scope of the application, where additional information may be obtained, and the opportunity for interested parties to be heard, to the property owners within 300' of the land subject to notification. I further certify that I relied on information provided to me by the above-mentioned person as to accuracy and mailing addresses of property owners within 300' of the land subject to notification.

9/23/19  
 Date

*Jeanne F. Khan*  
 Planning Director

STATE OF NORTH CAROLINA  
 COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 23 day of September, 2019.



*Jeri Chastain Pederson*  
 Notary Public

My Commission Expires: 03/10/2024