STAFF REPORT

Rezoning #21CZ29 North Salem Station PUD

May 10, 2022 Town Council Meeting

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

BACKGROUND INFORMATION:	
Location:	0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Applicant:	Ana Wadsworth, The Wooten Company
Authorized Agent:	Jeff Shifflett, Castle Development Partners
Owner:	Old Apex Associates, LP
PROJECT DESCRIPTION:	
Acreage:	+/- 10.39 acres
PINs:	0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
Current Zoning:	Planned Commercial (PC) & Neighborhood Business (B1)
Proposed Zoning:	Planned Unit Development–Conditional Zoning (PUD-CZ)
2045 Land Use Map:	High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Town Limits:	Inside Corporate Limits

ADJACENT ZONING & LAND USES:		
	Zoning	**Land Use**
North:	Cary Planned Development District (PDD Major); Residential Agriculture (RA)	Single-family Residential (Linville Ridge Subdivision); Vacant
South:	Planned Unit Development-Conditional Zoning (PUD-CZ #10CZ07); Neighborhood Business (B1); Cary Planned Development District (PDD Major)	Single-family residential (Ellington Place Subdivision); NCDOT remnant; Laurel Park Elementary
East:	Cary Mixed Use District (MXD); Neighborhood Business (B1)	Townhomes (Laurel Crossing Subdivision); NCDOT remnant
West:	Medium Density-Conditional Use (MD-CU #06CU17); Neighborhood Business-Conditional Use (B1-CU #98CU06)	Single-family residential (The Trace Subdivision); Office & Commercial

BACKGROUND:

The site consists of nine (9) parcels totaling +/- 10.39 acres. The North Salem Station PUD is in the northeast region of Apex, along North Salem Street and Laura Duncan Road. The property was previously rezoned in 1986, and has since been available for development with uses consistent with a shopping center. The lots are primarily vacant and cleared with a few small trees planted adjacent toward the public roads.

Since these parcels were created prior to the adoption of the UDO in 2000, they are governed by the pre-UDO zoning ordinance. This document was less stringent that the UDO in many ways. Rezoning the lots or changing the lot lines requires compliance with the current UDO. Below is a general list of differences.

	Current Zoning & Pre-UDO Zoning Ordinance	**Proposed Rezoning and/or UDO**
SCMs	Not Required	UDO Required
RCA	Not Required	20% UDO Required

	Current Zoning & Pre-UDO Zoning Ordinance	Proposed Rezoning and/or UDO
Parks & Rec Fees	Not Required	UDO Required
Greenway Construction	Not Required	UDO Required
Sidewalks	One Side of Street	Both Sides of Street in PUD
Parking Maximums	Not Required	PUD Provided
Architectural Standards	Very Limited	PUD Provided
Maximum Height	Max 5 Story	PUD Provided: Max 4 Story
Affordable Housing	Not Required	PUD Provided
Environmental Zoning Conditions	Not Required	PUD Provided

NEIGHBORHOOD MEETING:

The applicant conducted a neighborhood meeting on October 26, 2021. The meeting report is attached to the staff report.

2045 LAND USE MAP:

In 2021, Town Council updated the 2045 Land Use Map to add an apartment only designation to certain areas designated as High Density Residential along existing and planned transit routes. This site is one of those areas. The 2045 Land Use Map designates the parcels south of North Salem St as High Density Residential/Office Employment and the parcels north of North Salem St. as High Density Residential (apartments only)/Commercial Services. Per Advance Apex: 2045 Land Use Map Update, the minimum density for High Density Residential is 14 dwelling units per acre with a maximum density to be determined at the time of rezoning. The proposed rezoning is consistent with the 2045 Land Use Map designations in that it proposes a maximum of 23 dwelling units per acre or 239 apartments.

WCPSS COORDINATION:

A Letter of Impact from Wake County Public School System (WCPSS) was received for this rezoning and is included in the staff report packet. WCPSS indicates that all schools within the current assignment area for this rezoning/development are anticipated to have sufficient capacity for future students.

PLANNED UNIT DEVELOPMENT PLAN:

The applicant is proposing a Planned Unit Development with uses and development standards as follows:

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.

Permitted Residential Use Categories: Parcels 2, 3, and 4, as shown on PUD Layout	
Multi-Family/Apartment	Accessory apartment
Condominium	Utility minor
Townhouse	Park, active
Duplex	Park, passive
Triplex	Private Recreation Facility
Quadplex	

Permitted Non-Residential Use Categories: Parcel 6, as shown on PUD Layout	
Recreational Uses:	**Food and Beverage Services:**
Park Active/Park Passive	Restaurant, General
Office and Research:	**Industrial Services:**
Medical or Dental Office or Clinic	Woodworking or cabinetmaking
Medical or Dental Laboratory	Manufacturing and processing, minor (S)
Office (Business or Professional)	Microbrewery
Research Facility	Micro Distillery
Retail Sales and Services:	
Artisan Studio	Barber and Beauty Shop
Book Store	Floral Shop
Financial Institution	Grocery, General
Grocery, Specialty	Health/fitness center or spa
Kennel	Printing and copying service
Real estate sales	Retail sales, general
Studio for art	Tailor shop
Upholstery shop	Pet services

Conditions:

1. A maximum of 239 residential units shall be permitted upon the property. No more than 10% of which shall be 3 bedroom units.

2. Lots 2-4: The residential clubhouse building will incorporate a solar PV system (minimum 4KW DC Solar PV System). Solar conduits will be included in all residential buildings for potential future installations. All solar installation required by this condition shall be completed or under construction prior to the final building Certificate of Occupancy.

3. Pet waste stations shall be installed at 3 or more locations throughout the development.

4. Affordable Housing: To support the need for affordable housing within the Town of Apex, the Developer proposes that for a minimum affordability period of five (5) years from the issuance of the first residential certificate of occupancy (the "Affordability Period), at least eight (8) residential dwelling units built on the Property shall be designated as affordable low-income restricted rental units (the "Affordable Dwelling Units"). The Affordable Dwelling Units shall be rented to and occupied by low-income households during the Affordability Period at maximum rent limits per bedroom size and income limits adjusted for family size, no greater than sixty percent (60%) of the Raleigh, NC Metropolitan Statistical Area (MSA) Area Median Income (AMI) as most recently published by the U.S. Department of Housing and Urban Development (HUD) and stipulated by the most recently published North Carolina Housing Finance Agency (NCHFA) Low-Income Housing Tax Credit (LIHTC) Multifamily Tax Subsidy Program (MTSP) income and rent limits for the Wake Metropolitan area. Allocation of the Affordable Dwelling Units between 1, 2 and 3-bedroom units will be at the discretion of the Developer, so long as a minimum of eight (8) of the Project's total residential dwelling units are maintained as Affordable Dwelling Units. During the Affordability Period, the Developer shall be responsible for performing all property management and administration duties for the Affordable Dwelling Units. Following completion of the Affordability Period, this affordable housing condition shall expire, the Developer shall be relieved of all obligations set forth in this affordable housing condition, and the Affordable Dwelling Units may be freely marketed and leased at market-rate rents. A restrictive covenant (i.e. affordable

housing agreement) between the Town and Applicant shall be recorded against the property prior to the first Certificate of Occupancy to memorialize the affordable housing terms and conditions of the approved zoning condition.

5. Public Art: The Town of Apex's Public Art Plan designates the area around the intersection of Laura Duncan and North Salem as a "Major Gateway" into Apex. To help promote the Town's Public Art Plan, the Applicant proposes to dedicate an easement for the installation of public art. Location of the art installation will be agreed upon and determined during site plan review. Application proposes to donate $10,000 to the Citizens for Apex Parks to be allocated towards an art installation to be erected within this development area.

6. Sustainable Building Certification: The residential parcels shall apply for the National Green Building Standard Certification at the Bronze level and will be designed and constructed to meet those standards. The application process would begin at the start of architectural design for the residential buildings). The Certification would be obtained within 1 year of the building Certificate of Occupancy. A third-party energy management consultant will be contracted as a part of the design team to ensure that the standards are met.

Architectural Conditions:

The proposed development offers the following architectural controls to ensure a consistency of character throughout the development, while allowing for enough variety to create interest and avoid monotony. Changes to the exterior materials, roof, windows, doors, process, trim, etc. are allowable with administrative approval at the staff level. Further details shall be provided at the time of Site Plan submittal. The following conditions shall apply:

Residential (all product types):

1. Proposed materials and styles will be of a similar palette to provide consistency of character along with visual interest. Exterior materials that may be incorporated into any of the residential buildings include:
   a. Cementitious siding
   b. Wood or synthetic wood siding
   c. Stone or synthetic stone
   d. Brick
   e. Additional building materials may be included with administrative staff approval. Substitute materials shall be allowed by staff approval if the Planning Director determine them to be adequately similar.
2. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
3. For multi-family/apartment buildings, the roofs may be pitched or flat. All other housing types shall have pitched roofs.
4. Siding materials shall be varied in type and/or color on 30% of each facade on each building.
5. Windows that are not recessed must be trimmed.
6. Rooflines cannot be a single mass; they must be varied with the use of gables or parapets.
7. Solar conduit will be provided on all buildings to accommodate the future installation of solar panels.
8. The proposed residential unit mix will cap 3-bedroom units at 10% of the total unit count.

Non-Residential:

1. Architectural treatments such as varying roof forms, façade articulation, breaks in roof, walls with texture materials and ornamental details as well as landscaping shall be incorporated to add visual interest. Large expanses of blank walls, greater than 20 feet in length or height, shall be broken up with windows or other architectural features to reduce visual impacts.
2. Roof features may include flat roofs with parapet, hip roofs or awnings with metal or canvas material.
3. Two (2) or more materials shall be used on each building.

4. Permitted materials include:
    a. Brick, stone, or synthetic stone masonry
    b. Decorative concrete block (integral color or textured)
    c. Stone accents
    d. Aluminum storefront windows/doors with anodized or pre-finished colors
    e. EIFS cornices and parapet trim
    f. EIFS or synthetic stucco shall not be used in the first four feet above grade and shall be limited to 25% of each building facade.
    g. Precast concrete
    h. Cementitious siding
5. Prohibited materials include:
    a. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
    b. Painted, smooth faced concrete block
    c. Metal Walls. Decorative metal accents and panels may be accepted.
6. Exterior lighting shall not exceed a color temperature of 3,500K and shall meet UDO requirements for full cut off lights.

Proposed Design Controls:

Overall Maximum Density:	23 units/acre
Maximum Residential Units:	239
Maximum Building Height:	
Residential:	4 stories (60 ft.)
Non-Residential:	2 stories (40 ft.)
Maximum Built-Upon Area:	70%
Non-Residential Max Building Area:	10,000 sf

Residential Parcels:

Building Setbacks:	**Parcel 2:**	**Parcel 3:**	**Parcel 4:**
Front:	10 ft. along Candun Dr.	50 ft. south of Candun Dr. 20 ft. north of Candun Dr.	50 ft. along N. Salem St.
Side:	20 ft. along Laura Duncan Rd.	50 ft. along Old Apex Rd 5 ft. from buffer on north side	50 ft. along Laura Duncan Rd. 10 ft. along Candun Dr.
Rear:	5 ft. from perimeter buffer	60 ft.	10 ft. along Candun Dr.
From Buffers/RCA:			
For parking:	0 Ft from perimeter buffer	5 ft. from perimeter buffer	5 ft. from perimeter buffer

Non-Residential Parcel:

Building Setbacks:		**Parcel 6:**	
Front:	10 ft. from buffer	From Buffers/RCA:	
Side:	10 ft.	For parking:	5 ft. from perimeter buffer
Rear:	10 ft.		

Proposed Resource Conservation Area & Buffers:

The proposed North Salem Station PUD complies with the UDO requirement to dedicate 20% of the development as RCA. Parcels 1 and 5 will be dedicated as RCA. Parcels 1 and 5 shall be planted to meet the UDO's requirements for planted RCA and shall be dedicated as RCA prior to the last Site Plan Final Plat for the residential portion of the development.

RCA Breakdown	
Total Site Area:	10.39 acres/452,588 SF
Total RCA Required (20%):	2.08 acres/90,518 SF
Total RCA Provided (20.8%):	2.16 acres/93,944 SF

Perimeter Buffers – Lots 2, 3, and 4	UDO Requirement	PUD Proposal
Northern Buffer	20-foot Type B Buffer	10-foot Type A Buffer
Eastern Buffer	15-foot Type A Buffer	15-foot Type A Buffer
North Salem Street	30-foot Type B Buffer	30-foot Type A Buffer*
Western Buffer	15-foot Type A Buffer	No buffer
Candun Drive	No buffer	No buffer
Laura Duncan Road	0 feet	0 feet

*The overhead Duke Energy electric easement along North Salem Street shall be counted towards the required buffer standards as identified within various UDO sections. Vegetation planted under the buffer shall be chosen to be 20 feet or less tall, so as to avoid impacting the overhead utility lines.

Perimeter Buffers – Lot 6	UDO Requirement	PUD Proposal
North Salem Street	30-foot Type E Buffer	20-foot Type A Buffer
Eastern Buffer	No buffer	No buffer
Southern Buffer (Railroad)	20-foot Type A Buffer	No buffer
Western Buffer	No buffer	No buffer

Although not anticipated, any existing trees greater than 18" in diameter that are removed by site development shall be replaced by planting a 1.5" caliper native tree from the Town of Apex Design and Development Manual, either on-site or at an alternative location approved by Town Planning Staff, beyond standard UDO requirements.

Landscape will follow the Town's UDO to provide the required plantings on site throughout the development, as well.

Parking:

Parking calculations and dimensions for this PUD will comply with UDO Section 8.3 (Off-Street Parking and Loading) of the Town of Apex's Unified Development Ordinance unless otherwise stated in this document.

Residential:

This development proposes a minimum of 1.3 spaces/residential unit and a maximum of 1.6 spaces/residential unit for all surface lot spaces serving the residential lots. This cap on the maximum parking count was incorporated after discussions with Town Council members and is intended to reduce the number of parking spaces from what the ordinance would require otherwise to maximize green space and promote the use of public transit. The parking count will be based on all unit types and not specify a requirement per number of bedrooms. No more than 10% of the total unit count shall be 3-bedroom units.

Parking Space Comparison				
Estimated # of Units	Per UDO Min Required	Per PUD Min 1.3 spaces/unit	Per UDO Max Permitted	Per PUD Max 1.6 spaces/unit
1 & 2 bedrooms: 216	1.5 per unit = 324	281 (280.8 rounded up)		346 (345.6 rounded up)
3 bedrooms: 23	1.8 per unit = 41 (41.1 rounded down)	30 (29.9 rounded up)		37 (36.8 rounded up)
Total: 239	365	311	(365*1.15) = 420 (419.75 rounded up)	383
PUD difference from UDO	0	-54	0	-37

Non-Residential:

Parking associated with the non-residential use lots shall comply with UDO Section 8.3. Bicycle and ADA parking will be provided as required.

Electric Vehicle Charging Spaces:

A minimum of 5% of the parking spaces shall be Electric Vehicle (EV) Charging spaces. EV charging spaces for the residential development shall be based on the number of parking spaces required by the UDO rather than the reduced parking ratio proposed by the PUD. EV charging spaces shall be provided in either surface or garage lots in accordance with UDO Sec. 8.3.11.

Public Facilities:

The North Salem Station PUD will be served by Town of Apex water, sanitary sewer, and electrical systems. The utility design will be finalized at Master Subdivision Plan review. A conceptual Utility Plan is included in the PUD Plan for reference. There is a variable width Duke Electric easement running along the residential frontage on North Salem Street. Water and sewer are available within Laura Duncan Road and Candun Drive. The ultimate design for the utilities shall meet the current Town of Apex Master Water and Sewer Plans for approval.

The proposed PUD shall meet all stormwater management quality and quantity requirements in accordance with 6.1.7 of the Town of Apex's Unified Development Ordinance.

- Post-development peak runoff shall not exceed pre-development peak runoff for the 24-hour, 1- and 10-year storm events.
- Treatment will be provided for the 1st inch of runoff and will provide a minimum of 85% removal of total suspended solids.

Due to site constraints, stormwater control measures may include, but not be limited to, underground detention systems with NCDEQ approved Storm Filter and Filterra Systems for treatment and bioretention areas and/or construction stormwater wetlands in and around parking lots. If elevation change is feasible, an above ground stormwater detention pond may be added to a portion of the lot on the south side of N. Salem Street. All stormwater control measures shall be approved and designed according to the NCDEQ Design Manual as well as the Town of Apex's UDO.

Apex Transportation Plan/Access and Circulation:

Per the Apex Thoroughfare and Collector Street Plan map, North Salem Street is designated as an existing 3-lane thoroughfare. The developer will dedicate any right-of-way or easements necessary to accommodate the improvements listed below.

The Apex Bicycle and Pedestrian System Plan Map shows future Side Path along the east side of Laura Duncan Road and a greenway connection to the Town of Cary greenway running through Linville Ridge Subdivision. The PUD will provide sidewalks along both sides of all internal streets and construct a 10-foot Side Path along the eastern side of Laura Duncan Road. During construction of the residential development, the developer shall ensure that a safe, paved pedestrian route shall be maintained from Linville Ridge Subdivision to Laurel Park Elementary School.

Prior to the residential final plat, additional sidewalks, ADA ramps and crosswalks will be added along the street frontage of all residential parcels to enhance pedestrian connectivity around the development. A sidewalk along the south side of North Salem Street will be constructed from the intersection of Laura Duncan Road westward to the proposed bus stop located on the south side of North Salem Street. If approval of the bus stop and/or sidewalk on the south side of North Salem Street is not permitted by CSX Railroad, NCDOT and/or the Town of Cary, installation of this sidewalk will not be a condition of this rezoning and will not prohibit or delay any approvals or permits of the residential development.

Prior to the non-residential final plat, a sidewalk will be constructed along the property frontage of Lots 5 and 6, continuing eastward to the proposed bus stop located on the south side of North Salem Street. If approval of the bus stop and/or sidewalk on the south side of North Salem Street is not permitted by CSX Railroad, NCDOT and/or the Town of Cary, installation of this sidewalk will not be a condition of this rezoning and will not prohibit or delay any approvals or permits of the non-residential development.

At the intersection of Laura Duncan Road and North Salem Street, applicant shall install remaining two legs of the crosswalk with construction of the residential parcels. If approval of both (two) legs of the crosswalk are not permitted by CSX Railroad, NCDOT and/or Town of Cary, applicant will attempt approval of a single leg of crosswalk; if approval of a single leg of the crosswalk is not permitted by CSX Railroad, NCDOT and/or Town of Cary, installation of crosswalks at the intersection of Laura Duncan Road and North Salem Street will no longer be a condition of this rezoning and will not prohibit or delay any approvals or permits of the residential or non-residential developments.

The developer shall construct two bus stops per Town of Apex standards with amenity pad, bench, bicycle parking, and trash receptacle. Bus stops shall be constructed to accommodate a shelter, but shelters shall not be provided by the applicant. The bus stops shall be paired, to serve both sides of North Salem Street, the final location to be determined by Apex staff during site plan review. If needed, a Transit Access Easement shall be provided for public access to the bus stops.

Roadway improvements are subject to modification and final approval by the Town of Apex and NCDOT as part of the Master Subdivision Plan review and approval process. A Traffic Impact Analysis has been performed as part of this PUD rezoning consistent with the Town's standards for the same. Based upon the Traffic Impact Analysis, the following traffic improvements are proposed for this development:

1. All proposed driveway access and improvements on state-maintained roadways are subject to NCDOT review and approval.
2. All development frontage improvements along North Salem Street shall be based on a minimum 41' back-to-back 3-lane roadway on 80' right-of-way. As part of the non- residential site plan, a maximum of one (1) access point shall be proposed on North Salem Street, to be located west of Salem Church Road and serving the south parcel.
3. All development frontage along Laura Duncan Road shall include a 5' sidewalk on the west side and 10' Side Path on the east side. A maximum of two (2) access points shall be proposed, one located north of Candun Drive serving the west side and one across from Candun Drive serving the east side.

4. All development frontage along both sides of Candun Drive shall include a 5' sidewalk. A maximum of three (3) access points shall be proposed, two located across from each other west of Laura Duncan Road serving the north and south side and one north of North Salem Street serving the east side.
5. Developer shall provide a 50' building setback along Laura Duncan Road from North Salem Street to Candun Drive and along the entire development frontage of North Salem Street in consideration of the planned grade separation of Laura Duncan Road at the railroad tracks.
6. Developer shall perform a warrant study for the intersection of Salem Church Road at North Salem Street if directed by Apex staff prior to site plan approval of the non-residential parcel south of North Salem Street and install a traffic signal if determined by warrant study and required by NCDOT. If not required at that time, developer shall have no future responsibility for a traffic signal.
7. Developer will dedicate a maximum of 0.24 acres of additional right of way as shown on the Site Layout based on a conceptual future single-lane roundabout at the intersection of North Salem Street and Salem Church Road.
8. At the time of constructing driveway access to the non-residential parcel located south of North Salem Street, developer shall widen North Salem Street to provide a two-way left-turn lane (TWLTL) between the driveway access and Salem Church Road serving left turns at both intersections.
9. Prior to the first Site Plan Final Plat for the residential parcels, Developer shall lengthen the eastbound left turn lane on Old Apex Road approaching Cary Parkway to the maximum extent possible by restriping the existing painted median island for additional storage length only if NCDOT allows this work to be done without milling and asphalt overlay. If NCDOT requires milling and asphalt overlay then this work shall not be required of the Developer.

ENVIROMENTAL ADVISORY BOARD:

The Apex Environmental Advisory Board (EAB) held a pre-application meeting for this rezoning on August 19, 2021. The zoning conditions suggested by the EAB are listed below along with the applicant's response to each condition.

EAB Suggested Condition	Applicant's Response
1. Project shall apply for sustainable building certification.	Included
2. Pet waste stations shall be installed throughout the neighborhood.	Included
3. Site shall include electric vehicle charging stations.	Included
4. Include International Dark Sky Association compliance standards: Outdoor lighting shall be shielded in a way that focuses lighting to the ground. Lighting that minimizes the emission of blue light to reduce glare shall be used. Lighting with a color temperature of 3000K or less shall be used for outside installations.	Included
5. Reserve pervious surfacing areas for residents with pets.	Included
6. Double the set-back from Old Raleigh to accommodate a minimum 30-foot-wide "A" type buffer.	Included
7. Provide an "A" type buffer around the remainder of the development.	Included
8. Add a retention pond that will serve a "25-year storm" with a maximum residual volume allowed for the pond surface area.	Not included
9. Use canopy trees in the parking lot and add six trees internal to the lot.	Not included

EAB Suggested Condition	Applicant's Response
10. Install solar PV systems on the south facing rooftops of a minimum size that will support the common electrical energy requirements. This includes the recreational room and pool. If there is additional rooftop available, install solar energy PV systems that provide electricity to individual apartments.	Included on clubhouse

Due to site constraints, an underground detention system with other surface stormwater control measures will be proposed to detain and treat runoff from the 1- and 10- year, 24-hour storm events.

If site design allows, applicant agrees to install additional trees where appropriate.

PARKS, RECREATION, AND CULTURAL RESOURCES ADVISORY COMMISSION:

The Parks, Recreation and Cultural Resources Advisory Commission reviewed the project on February 23, 2022. They unanimously recommended a fee-in-lieu of dedication for 240 multi-family units and with credit for construction of greenway trail against fees owed. The timing for the completion of the greenway should be tied to the approval of the final plat. The rate of the fee-in-lieu will be set at the time of Town Council approval. The current 2022 rate of $2,226.05 multiplied by the maximum multi-family unit total would result in $534,252.00 of fees deposited with the Town at the time the building permit is approved for issue with greenway construction credit applied first.

# of Units	Fee per Unit	Total Fee
240	$2,226.05	$534,252.00

**The PRCR Commission reviewed this rezoning before the maximum number of apartments was reduced to 239.*

PLANNING STAFF RECOMMENDATION:

Planning staff recommends approval of Rezoning #21CZ29 North Salem Station PUD as proposed by the applicant.

PLANNING BOARD RECOMMENDATION:

The Planning Board held a Public Hearing on April 11, 2022 and voted 4 to 3 to recommend approval of the rezoning with the conditions offered by the applicant.

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 2045 Land Use Map designates the parcels south of North Salem St as High Density Residential/Office Employment and the parcels north of North Salem St. as High Density Residential (apartments only)/Commercial Services. Per Advance Apex: 2045 Land Use Map Update, the minimum density for High Density Residential is 14 dwelling units per acre with a maximum density to be determined at the time of rezoning. The proposed rezoning is consistent with the 2045 Land Use Map designations in that it proposes a maximum of 23 dwelling units per acre or 239 apartments. The Apex Town Council has further considered that the proposed rezoning to Planned Unit Development–Conditional Zoning (PUD-CZ) will provide the flexibility to accommodate the growth in population, economy, and infrastructure consistent with that contemplated by the 2045 Land Use Map.

The proposed rezoning is reasonable and in the public interest because it will support increased transit ridership, permit infill development, require greater environmental conditions than the existing zoning and provide an affordable housing option.

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 10% provided that the PD Plan for PUD-CZ includes one or more of the following:
   (i) A non-residential component;
   (ii) An overall density of 7 residential units per acre or more; or
   (iii) Environmental measures including but not limited to the following:
      a. The installation of a solar photovoltaic (PV) system on a certain number or percentage of single-family or townhouse lots or on a certain number or percentage of multifamily, mixed-use, or nonresidential buildings. All required solar installation shall be completed or under construction prior to 90% of the building permits being issued for the approved number of lots or buildings. For single-family or townhouse installations, the lots on which these homes are located shall be identified on the Master Subdivision Plat, which may be amended;
      b. The installation of a geothermal system for a certain number or percentage of units within the development; or
      c. Energy efficiency standards that exceed minimum Building Code requirements (i.e. SEER rating for HVAC).

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 Planned Unit Development-Conditional Zoning (PUD-CZ) designation demonstrates compliance with the following standards. 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.

December 29, 2021

Michael P. Karpinski, PE.
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609

Subject: **Staff summary and comments for the North Salem Station TIA, 12/01/2021**

Mr. Karpinski:

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 studied access to the proposed mixed-use development at the following five (5) intersections:

- Laura Duncan Road and Candun Drive/Access A
- Laura Duncan Road and Access B
- Candun Drive and Access C
- Candun Drive and Access D
- N. Salem Street and Access E (commercial parcel access).

The following four (4) intersections were also studied in the TIA:

- N. Salem Street and Salem Church Road
- N. Salem Street and Candun Drive
- N. Salem Street / Old Apex Road and Laura Duncan Road
- Old Apex Road and Cary Parkway

Trip Generation

The proposed development is expected to consist of up to 240 low-rise apartment units and 10,000 square feet of retail space. It's projected to generate approximately 31 new trips entering and 88 new trips exiting the site during the weekday A.M. peak hour and 112 new trips entering and 82 new trips exiting the site during the weekday P.M. peak hour. The development is projected to add an additional 3,030 new daily trips onto the adjacent roadway network.

Background traffic

Background traffic consists of 3% annual background traffic growth compounded to build out year 2024.

Trip Distribution and Assignment

The trip distributions to and from the development site are as follows:

- 25% to/from the south via Laura Duncan Road
- 5% to/from the north via Laura Duncan Road
- 25% to/from the west via N. Salem Street
- 10% to/from the east via Old Apex Road
- 10% to/from the west via Salem Church Road
- 10% to/from the north via Cary Parkway
- 15% to/from the south via Cary Parkway

The proposed apartment complex in Scenario 1 is anticipated to be accessed from Laura Duncan Road and Candun Drive via Access A, B, C and D while the proposed retail space in Scenario 2 is anticipated to have a separate driveway to N. Salem Street west of Salem Church Road via Access E.

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 9 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 2021** - Existing year 2021 traffic.
- **No Build 2024 –** Projected year (2024) with background growth.
- **Build 2024 Scenario 1 –** Projected year (2024) with background traffic, and apartment build out only.
- **Build 2024 Scenario 2 –** Projected year (2024) with background traffic, and full build out of the development.

Laura Duncan Road and Candun Drive/Access A

Table 1. A.M. / P.M. Unsignalized Peak Hour Levels of Service Laura Duncan Road and Candun Drive/Access A				
	Existing 2021	**No Build 2024**	**Build 2024 – Scenario 1**	**Build 2024 – Scenario 2**
Overall	NA	NA	NA	NA
Eastbound (Candun Drive)	*A / A*[1]	*A / A*[1]	*B / B*[1]	*B / B*[1]
Westbound (Access A)	*NA*	*NA*	*B / B*[1]	*B / B*[1]
Northbound (Laura Duncan Road)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*A / A*[2]
Southbound (Laura Duncan Road)	*NA*	*NA*	*A / A*[2]	*A / A*[2]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of Access A as a two-lane road (one lane of ingress and one lane of egress) with stop control on the approach leg. The TIA recommends that Access A is aligned with Candun Drive which is an existing public street.

Apex staff recommendations:

- Apex staff concur with the recommendations. The stop-controlled minor-street approaches are projected to operate at LOS B during both peak hours in both the build scenarios. Queuing on the minor-street approaches is not projected to be greater than 25 feet. The left turn movements off Laura Duncan Road are projected to operate at LOS A with minimal queueing and vehicular delays.

Laura Duncan Road and Access B

Table 2. A.M. / P.M. Unsignalized Peak Hour Levels of Service Laura Duncan Road and Access B		
	Build 2024 – Scenario 1	**Build 2024 – Scenario 2**
Overall	NA	NA
Eastbound (Access B)	*A / A[1]*	*A / A[1]*
Northbound (Laura Duncan Road)	*A / A[2]*	*A / A[2]*
Southbound (Laura Duncan Road)	*NA*	*NA*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of Access B as a two-lane road (one lane of ingress and one lane of egress) with stop control on the approach leg.

Apex staff recommendations:

- Apex staff concur with the recommendations. The stop-controlled minor-street approach is projected to operate at LOS A during both peak hours in both the build scenarios with no queues. The northbound left turn movement off Laura Duncan Road is also projected to operate at LOS A with no queueing and minimal vehicular delays.

Candun Drive and Access C

Table 3. A.M. / P.M. Unsignalized Peak Hour Levels of Service Candun Drive and Access C		
	Build 2024 – Scenario 1	**Build 2024 – Scenario 2**
Overall	NA	NA
Eastbound (Candun Drive)	*A / A*[2]	*A / A*[2]
Westbound (Candun Drive)	*A / A*[2]	*A / A*[2]
Northbound (Access C)	*A / A*[1]	*A / A*[1]
Southbound (Access C)	*A / A*[1]	*A / A*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of the northbound and southbound approaches as two-lane roads (one lane of ingress and one lane of egress), with stop-control on the new minor-street approach legs.

Apex staff recommendations:

- Apex staff concur with the recommendations. The stop-controlled minor-street approaches are projected to operate at LOS A during both peak hours in both the build scenarios. Queuing on the minor-street approaches is not projected to be greater than 25 feet. The left turn movements off Candun Drive are projected to operate at LOS A with no queueing and minimal vehicular delays.

Candun Drive and Access D

Table 4. A.M. / P.M. Unsignalized Peak Hour Levels of Service Candun Drive and Access D		
	Build 2024 – Scenario 1	**Build 2024 – Scenario 2**
Overall	NA	NA
Westbound (Access D)	*A / A*[1]	*A / A*[1]
Northbound (Candun Drive)	*NA*	*NA*
Southbound (Candun Drive)	*A / A*[2]	*A / A*[2]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of the westbound approach as a two-lane road (one lane of ingress and one lane of egress), with stop-control on the new approach leg.

Apex staff recommendations:

- Apex staff concur with the recommendations. Apex staff recommends that Access D is aligned with the existing driveway on Candun Drive. The stop-controlled minor-street approach is projected to operate at LOS A during both peak hours in both the build scenarios. Queuing on the minor-street approaches is not projected to be greater than 25 feet. The left turn movement off Candun Drive is projected to operate at LOS A with no queueing and minimal vehicular delays.

North Salem Street and Access E

Table 5. A.M. / P.M. Unsignalized Peak Hour Levels of Service North Salem Street and Access E	
	Build 2024 – Scenario 2
Overall	NA
Eastbound (N Salem Street)	*NA*
Westbound (N Salem Street)	*A / A[2]*
Northbound (Access E)	*B / C[1]*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends construction of an exclusive westbound left-turn lane on N. Salem Street. The TIA recommends that the left turn lane be developed with widening for a two-way left-turn lane (TWLTL) along N. Salem Street that begins at Access E and terminates at Candun Drive. Additionally, the TIA recommends that Access E is constructed as a two-lane stop-controlled approach, with one lane of ingress and one lane of egress.

Apex staff recommendations:

- Apex staff recommends a westbound left turn lane on N. Salem Street at Access E with a minimum of 50 feet of storage and appropriate deceleration length and taper per NCDOT guidance. Apex staff does not recommend carrying a TWLTL widening along N. Salem Street through the Y-intersection of Salem Church Road, but rather terminating an eastbound left turn at Salem Church Road. The design as proposed in the TIA may create an undesirable lane shift without providing any improvement to operations. Therefore, staff do not recommend that additional widening without further evaluation during the design phase subject to NCDOT approval.
- The stop-controlled approach is projected to operate at LOS C or better with average vehicle delays of less than 16 seconds per vehicle, and queues of less than 25 feet. Additionally, the left turn into the site is projected to operate at LOS A with minimal vehicle delays and queues.

North Salem Street and Salem Church Road

Table 6. A.M. / P.M. Unsignalized Peak Hour Levels of Service North Salem Street and Salem Church Road				
	Existing 2021	**No Build 2024**	**Build 2024 – Scenario 1**	**Build 2024 – Scenario 2**
Overall	NA	NA	NA	NA
Eastbound (N Salem Street)	*A / A[2]*	*A / A[2]*	*A / A[2]*	*A / A[2]*
Westbound (N Salem Street)	*NA*	*NA*	*NA*	*NA*
Southbound (Salem Church Road)	*D / E[1]*	*E / F[1]*	*E / F[1]*	*C / D[1]*

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends widening of North Salem Street to a three-lane cross-section providing a continuation of the existing TWLTL along N Salem Street from Candun Drive to Access E. Widening of North Salem Street is recommended with Scenario 2 (apartments + commercial parcel) build out.

Apex staff recommendations:

- Apex staff recommends consideration of studying the intersection for signal warrants prior to development of the commercial parcel (Scenario 2), and install a traffic signal if permitted by NCDOT. This unsignalized intersection has experienced four (4) reported potentially correctable crashes (assuming signalization vs. stop control) in the year 2018 and 2019 and is anticipated to experience LOS E/F delays on the stop-controlled approach in the peak hours. It should be noted that the development is not projected to add more than 3% of traffic to this intersection, and no more than 10% to any one particular movement. Per UDO Section 13.19, signalization is not required to mitigate development traffic impact.
- Additionally, staff recommends construction of an eastbound left turn lane with a minimum of 50 feet of storage and appropriate deceleration length and taper as an alternative to a TWLTL extension through the intersection as noted previously. If further evaluation results in an acceptable alternative plan for the TWLTL extension subject to NCDOT approval then it could be presented as part of Phase 2.
- The TIA analysis shows that a TWLTL along North Salem Street significantly improves operations on the southbound approach from LOS E and LOS F to LOS C and LOS D in the AM and PM peaks, respectively. However, the Synchro analysis assumes the TWLTL can be used as a vehicle refuge area, allowing vehicles turning left from Salem Church Road to traverse the roadway one direction of travel at a time. This type of maneuver may not be practicable or advisable. Therefore, a more conservative approach that analyzes the TWLTL as a simple left turn lane at the intersection is recommended. When analyzed in this manner, operations on Salem Church Road

would remain at LOS E and LOS F in the AM and PM peak hours, respectively. Apex staff also have concerns about constructability and potential impacts of the TWLTL extension. Therefore, an eastbound left turn was recommended for vehicle storage at the intersection in lieu of the TWLTL extension regardless of anticipated impact on level service.

- Additionally, Town staff evaluated the possibility of converting this intersection to all-way stop control (AWSC). However, operations at the intersection break down, with multiple approaches experiencing LOS F in an AWSC scenario. Based on that analysis, AWSC is not recommended as an interim step prior to signalization subject to NCDOT approval.

North Salem Street and Candun Drive

Table 7. A.M. / P.M. Unsignalized Peak Hour Levels of Service
North Salem Street and Candun Drive

	Existing 2021	No Build 2024	Build 2024 – Scenario 1	Build 2024 – Scenario 2
Overall	NA	NA	NA	NA
Eastbound (N Salem Street)	*A / A*[2]	*A / A*[2]	*A / A*[2]	*A / A*[2]
Westbound (N Salem Street)	*NA*	*NA*	*NA*	*NA*
Southbound (Salem Church Road)	*B / B*[1]	*B / C*[1]	*B / C*[1]	*B / C*[1]

1. Level of service for stop-controlled minor street approaches.
2. Level of service for left turn movements on free-flowing approaches.

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendation. The stop-controlled minor-street approach is projected to operate at LOS C or better during both peak hours in both the build scenarios with queues of 25 feet. The northbound left turn movement off North Salem Street is also projected to operate at LOS A with minimal queues and vehicular delays.

North Salem Street / Old Apex Road and Laura Duncan Road

Table 8. A.M. / P.M. Signalized Peak Hour Levels of Service North Salem Street / Old Apex Road and Laura Duncan Road				
	Existing 2021	**No Build 2024**	**Build 2024 – Scenario 1**	**Build 2024 – Scenario 2**
Overall	B / D	C / D	C / D	C / E
Eastbound (N Salem Street)	*C / D*	*C / E*	*C / E*	*C / F*
Westbound (Old Apex Road)	*A / B*	*A / C*	*B / C*	*B / C*
Northbound (Laura Duncan Road)	*C / F*	*C / E*	*D / E*	*D / E*
Southbound (Laura Duncan Road)	*B / D*	*C / D*	*C / D*	*C / D*

TIA recommendations:

- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff concur with the recommendation in the TIA. The signalized intersection is projected to operate at LOS E in the PM peak hour under Scenario 2, with the eastbound approach operating at LOS F. Queueing and vehicle delays are projected to increase on all approaches with both Scenarios 1 and 2. However, the increase in intersection traffic due to the development is projected to be less than 10%, and turn movement storage bays are not exceeded with the addition of development traffic. Per UDO Section 13.19, no improvements are required to mitigate development traffic impact.
- Apex staff also evaluated restriping the right turn on the westbound approach to a through-right, and continuing the lane drop section further westward to Candun Drive. However, the anticipated lane utilization of that improvement would be low and not expected to improve overall operations from LOS E in the PM peak hour of Scenario 2, and thus is not recommended.

Old Apex Road and Cary Parkway

Table 9. A.M. / P.M. Signalized Peak Hour Levels of Service Old Apex Road and Cary Parkway				
	Existing 2021	**No Build 2024**	**Build 2024 – Scenario 1**	**Build 2024 – Scenario 2**
Overall	D / E	D / E	D / E	D / E
Eastbound (Old Apex Road)	*E / F*	*E / F*	*E / F*	*E / F*
Westbound (Old Apex Road)	*E / E*	*E / E*	*E / E*	*E / E*
Northbound (Cary Parkway)	*D / D*	*D / D*	*D / D*	*D / D*
Southbound (Cary Parkway)	*D / D*	*D / D*	*D / D*	*D / D*

TIA recommendations:

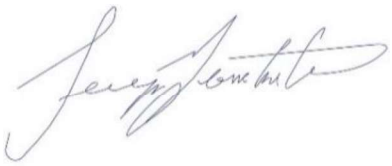
- The TIA recommends no improvements at this intersection.

Apex staff recommendations:

- Apex staff recommend consideration of lengthening the eastbound left turn lane to the maximum extent possible by restriping the existing painted median island for additional storage length. The signalized intersection is projected to operate at LOS E in the PM peak hour under both scenarios, with the eastbound approach operating at LOS F. Queueing and vehicle delays are projected to increase on all approaches with both Scenarios 1 and 2, but LOS remains the same with or without the development traffic. The 95th percentile queues are projected to exceed the storage capacity of the left turn bays on the eastbound and northbound approaches. However, the increase in overall intersection traffic due to the development is projected to be less than 10%. Likewise, the development is not anticipated to increase traffic more than 7% for any one particular turn movement. Per UDO Section 13.19, no improvements are required to mitigate development traffic impact.

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,



Serge Grebenschikov
Traffic Engineer
919-372-7448


Moravia Ln
Tealight Ln
Bethabara Ln
Kaylin Ln
The Trace II
The Trace
Dotson Way
Laura Duncan Rd
Carostone Ct
Monmouth Loop
Candun Dr
Old Apex Rd
Rezoning #21CZ29
N Salem St
Salem Church Rd
New Derby Ln
Olde Salem Way
Salem Pointe
Salem Pointe Pl
Blossom Bay Ln
Ellington Place
Sweet Laurel Ln
Laurel Park Pl
Laurel Park Elementary School
March 2022
February 2022 Aerial Photography
Prepared by: Town of Apex Planning Department
0
250
500
Feet

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 #:	21CZ29	Submittal Date:	12/1/21
Fee Paid	$ 1,703.90	Check #	058825

PETITION TO AMEND THE OFFICIAL ZONING DISTRICT MAP

Project Name: North Salem Station

Address(es): 0 Candun Dr., 0 Laura Duncan Rd., 0 N. Salem St.

PIN(s) 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795 0753015606, 0753013228, 0743908968 Acreage: 10.39 Acres

Current Zoning: PC (7 Parcels) & B1 (2 Parcels) Proposed Zoning: PUD - CZ

Current 2045 LUM Designation: High-Density Residential & Commercial; High-Density Residential & Office Employment

Is the proposed rezoning consistent with the 2045 LUM Classification(s)? Yes ☒ No ☐

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

Applicant Information

Name: Ana Wadsorth

Address: 120 N. Boylan Avenue

City: Raleigh State: NC Zip: 27603

Phone: 919-828-0531 E-mail: awadsworth@thewootencompany.com

Owner Information

Name: David J & Marilyn B Martin Irrevocable Trust

Address: 1201 Buck Jones Rd.

City: Raleigh State: NC Zip: 27606

Phone: 919-420-1568 E-mail: blake.thomas@avisonyoung.com

Agent Information

Name: Jeff Shifflett

Address: 230 Court Square, Suite 202

City: Charlottesville State: VA Zip: 22902

Phone: 434-531-6301 E-mail: jshifflett@castledp.com

Other contacts: Jess Achenbach - jachenbach@castledp.com

PLANNED UNIT DEVELOPMENT APPLICATION

Application #: 21CZ29 Submittal Date: 12/1/21

PLANNED UNIT DEVELOPMENT DISTRICT 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. The PD text and plan should demonstrate how the standards of Sec. 2.3.4.F are met be the proposed rezoning.

LEGISLATIVE CONSIDERATIONS - CONDITIONAL ZONING

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. Use additional pages as needed.

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.

North Salem Station PUD-CZ is consistent with the High-Density Residential Overlays that were adopted into the 2045 LUM in February 2020 and the proposed design is compatible with the uses and character of the surrounding properties.

2) *Compatibility.* The proposed Conditional Zoning (CZ) District use's appropriateness for its proposed location and compatibility with the character of surrounding land uses.

The proposed zoning district PUD-CZ is allowed within the High-Density Residential Use per the 2045 Town of Apex's Land Use Map. The development proposes a density of 23 units per acre. The proposed location of the development is compatible with the character of the 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.

Supplemental standards pertaining to multi-family development, as well as, the future use of the non-residential parcels will be incorporated into the final design.

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.

Design will adhere to Town of Apex design standards to minimize adverse impacts to surrounding land. Architectural guidelines and controls will ensure that an appropriate aesthetic is incorporated that is consistent with local architecture and maintains a high level of quality. The project will not create any significant or uncommon nuisances to the surrounding properties.

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.

Design will minimize environmental impacts by adhering to all Town of Apex site planning requirements and any necessary mitigation efforts. The project will incorporate a 20% RCA factor and include additional conditions beneficial to environmental impacts such as solar panels, pump station improvements (if necessary) and electric vehicle charging stations.

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.

CZ use will not create any unique or uncommon impacts on public facilities. Any impacts to public facilities will be mitigated by public improvements at the Property or fees in lieu, as required by the Town of Apex.

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.

CZ use will meet all applicable guidelines for health, safety or welfare of the residents of the Town of Apex.

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

CZ use is in compliance with the Town of Apex's recommended use for the Property, as determined in the 2045 Land Use Map. Proposed residential and office/flex uses are consistent with adjacent properties. Increased building setbacks have been incorporated on property lines in close proximity to existing residences.

PETITION PROCESS INFORMATION

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.

CZ use will not create or constitute a nuisance or hazard. A TIA will be included with this application to recommend any traffic impact mitigation improvements necessary as a result of the CZ use. The project will comply with traffic mitigation improvements, as required by the Town of Apex.

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.

CZ use will comply with all standards imposed on it by all other applicable provision of this Ordinance for use, layout and general development characteristics.

DEVELOPMENT NAME APPROVAL APPLICATION

Application #: 21CZ29 Submittal Date: 12/1/21

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 #: 21CZ29 Submittal Date: 12/1/21

Proposed Subdivision/Development Information

Description of location: Nine parcels at intersection of Laura Duncan, Candun Drive and North Salem Street

Nearest intersecting roads: Laura Duncan Road, Candun Drive and North Salem Street

Wake County PIN(s): 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015

Township: Cary and White Oak

Contact Information (as appropriate)

Contact person: Jeff Shifflett

Phone number: 434-531-6301 Fax number:

Address: 230 Court Square, Suite 202, Charlottesville, VA 22902

E-mail address: jshifflett@castledp.com

Owner: DAVID J & MARILYN B MARTIN IRREVOCABLE TRUST

Phone number: 919-420-1568 Fax number:

Address: 1201 BUCK JONES RD., RALEIGH NC 27606-5635

E-mail address: blake.thomas@avisonyoung.com

Proposed Subdivision/Development Name

1st Choice: North Salem Station

2nd Choice *(Optional)*:

Town of Apex Staff Approval:

Town of Apex Planning Department Staff Date

AGENT AUTHORIZATION FORM

Application #: 21CZ29 Submittal Date: 12/1/21

DAVID J & MARILYN B MARTIN IRREVOCABLE TRUS is the owner* of the property for which the attached application is being submitted:

- ☐ Land Use Amendment
- ☑ Rezoning: For Conditional Zoning and Planned Development rezoning applications, this authorization includes express consent to zoning conditions that are agreed to by the Agent which will apply if the application is approved.
- ☐ Site Plan
- ☐ Subdivision
- ☐ Variance
- ☐ Other:

The property address is: 0 Candun Drive

The agent for this project is: Jeff Shifflett

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

Agent Name: Jeff Shifflett

Address: 230 Court Square, Suite 202, Charlottesville, VA 22902

Telephone Number: 434-531-6301

E-Mail Address: jshifflett@castledp.com

Signature(s) of Owner(s)*

DAVID J. AND MARILYN B. MARTIN IRREVOCABLE TRUST DATED THE 24TH DAY OF NOVEMBER, 2010

Donna Evenson, Trustee — Donna M. Evenson, Trustee — 11/29/2021

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.

Pursuant to Article 40 of Chapter 66 of the North Carolina General Statutes (the Uniform Electronic Transactions Act) this application and all documents related hereto containing an electronic or digitized signature are legally binding in the same manner as are hard copy documents executed by hand signature. The parties hereby consent to use electronic or digitized signatures in accordance with the Town's Electronic Signature Policy and intend to be bound by the application and any related documents. If electronic signatures are used the application shall be delivered in an electronic record capable of retention by the recipient at the time of receipt.

AFFIDAVIT OF OWNERSHIP

Application #: 21CZ29 Submittal Date: 12/1/21

The undersigned, Donna Evenson (the "Affiant") first being duly sworn, hereby swears or affirms as follows:

1. Affiant is over eighteen (18) years of age and authorized to make this Affidavit. The Affiant is the sole owner, or is the authorized agent of all owners, of the property located at 0 Candun Drive, Apex, NC and legally described in **Exhibit "A"** attached hereto and incorporated herein (the "Property").

2. This Affidavit of Ownership is made for the purpose of filing an application for development approval with the Town of Apex.

3. If Affiant is the owner of the Property, Affiant acquired ownership by deed, dated 12/30/2010, and recorded in the Wake County Register of Deeds Office on 12/30/2010, in Book 014220 Page 01310-01315 & 01346-01350.

4. If Affiant is the authorized agent of the owner(s) of the Property, Affiant possesses documentation indicating the agency relationship granting the Affiant the authority to apply for development approval on behalf of the owner(s).

5. If Affiant is the owner of the Property, from the time Affiant was deeded the Property on 12/30/2010, Affiant has claimed sole ownership of the Property. Affiant or Affiant's predecessors in interest have been in sole and undisturbed possession and use of the property during the period of ownership. Since taking possession of the Property on 12/31/2010, no one has questioned Affiant's ownership or right to possession nor demanded any rents or profits. To Affiant's knowledge, no claim or action has been brought against Affiant (if Affiant is the owner), or against owner(s) (if Affiant is acting as an authorized agent for owner(s)), which questions title or right to possession of the property, nor is any claim or action pending against Affiant or owner(s) in court regarding possession of the Property.

This the 29 day of NOVEMBER 2021.

David J. & Marilyn B. Martin Irrevocable Trust dated the 24th day of November, 2010.

Donna M. Evenson (seal)

Donna Evenson, Trustee

Type or print name

STATE OF NORTH CAROLINA
COUNTY OF WAKE

I, the undersigned, a Notary Public in and for the County of WAKE, hereby certify that DONNA M. EVENSON, Affiant, personally known to me or known to me by said Affiant's presentation of said Affiant's N/A, personally appeared before me this day and acknowledged the due and voluntary execution of the foregoing Affidavit.

ROBERT B. DASCOMBE NOTARY PUBLIC WAKE COUNTY, N.C. [NOTARY SEAL]

Robert B. Dascombe

Notary Public
State of North Carolina
My Commission Expires: 11-14-2026

Robert B. Dascombe

AFFIDAVIT OF OWNERSHIP: EXHIBIT A – LEGAL DESCRIPTION

Application #: 21CZ29 Submittal Date: 12/1/21

Insert legal description below.

See Attached

This is a description of a survey for the Town of Apex, being that property recorded in Deed Book 18823 at Page 715 in the Wake County Registry of Deeds, being located in The Town of Apex, Wake County, North Carolina and being more particularly described as follows:

TRACT 1

Being a portion of the property of Old Apex Associates, LP, a deed which is recorded in Deed Book 18823 at Page 715 (Tract IV and a Portion of Tract I), being Lot 3 as shown on the plat entitled "Duncan Plaza, Phase 1" a plat which is recorded at Book of Maps 1989 at Page 1135; and Lot 4 as shown on the plat entitled "Subdivision Map of Lots 1-2, 4-10 Parkway Station", a plat which is recorded at Book of Maps 1992 at Page 344, all being recorded in the Wake County Registry of Deeds.

Beginning on an iron pipe found on the southern right-of-way of Candun Drive, a 60-foot wide right-of-way recorded at Book of Maps 1992 at Page 344, being a common corner with Lot 3 as shown on the plat entitled "Duncan Plaza, Phase 1" a plat which is recorded at Book of Maps 1989 at Page 1135; and with Lot 4 as shown on the plat entitled "Subdivision Map of Lots 1-2, 4-10 Parkway Station", a plat which is recorded at Book of Maps 1992 at Page 344, all being recorded in the Wake County Registry of Deeds; said Point of Beginning having the North Carolina State Plane (Grid) coordinates (NAD 83 – 2011) of North 731,826.82 feet and East 2,050,554.86 feet; thence from the Beginning Point and continuing with Lot 4 (BM 1992, Pg. 344) and the southern right-of-way of Candun Drive for two calls: North 68 degrees 50 minutes 19 seconds East 179.76 feet to an iron pipe set at a point of curve; and a curve to the right having a radius of 30.00 feet, an arc length of 47.48 feet and a chord of South 65 degrees 48 minutes 47 seconds East 42.68 feet to an iron pipe set at a point of tangency being located on the western right-of-way of Laura Duncan Road, a variable width right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds; thence continuing with Lot 4 and the western right-of-way of Laura Duncan Road for four calls: South 20 degrees 27 minutes 55 seconds East 93.97 feet to an iron pipe set; South 13 degrees 20 minutes 35 seconds East 40.28 feet to an iron pipe set; South 20 degrees 27 minutes 55 seconds East 97.54 feet to an iron pipe set at a point of curve; and a curve to the right having a radius of 30.00 feet, an arc length of 47.13 feet and a chord of South 24 degrees 32 minutes 05 seconds West 42.43 feet to an iron pipe set at a point of tangency being located on the northern right-of-way of Old U.S. Highway 1 – North Salem Street, a 75-foot wide right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds; thence continuing with Lot 4 and the northern right-of-way of Old U.S. Highway 1 – North Salem Street for two calls: South 69 degrees 29 minutes 11 seconds West 122.07 feet to an iron pipe set; and South 69 degrees 29 minutes 11 seconds West 14.44 feet to an iron pipe found, being a common corner with Lot 4 and the aforementioned Lot 3 (BM 1989, Pg. 1135); thence continuing with Lot 3 and the northern right-of-way Old U.S. Highway 1 – North Salem Street for four calls: South 69 degrees 28 minutes 22 seconds West 83.65 feet to an iron pipe set; South 69 degrees 25 minutes 17 seconds West 99.41 feet to an iron pipe set; South 69 degrees 41 minutes 21 seconds West 3.86 feet to an iron pipe set at a point of curve; and a curve to the right having a radius of 30.00 feet, an arc length of 47.13 feet and a chord of North 66 degrees 29 minutes 30 seconds West 42.43 feet to an iron pipe set at a point of tangency being located on the eastern right-of-way of Candun Drive, a 60-foot wide right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds; thence continuing with Lot 3 and the eastern right-of-way of Candun Drive for three calls: North 21 degrees 29 minutes 10 seconds West 137.35 feet to an iron pipe set on a point of curve; a curve to the right having a radius of 120.00 feet, an arc length of 189.18 feet and a chord of North 23 degrees 40 minutes 36 seconds East 170.19 feet to an iron pipe set at a point of tangency; and North 68 degrees 50 minutes 19 seconds East 62.78 feet to the Point of Beginning, containing 2.50 Acres by coordinates.

TRACT 2

Being a portion of the property of Old Apex Associates, LP, a deed which is recorded in Deed Book 18823 at Page 715 (Portion of Tract I), being Lots 6 and 7 as shown on the plat entitled "Subdivision Map of Lots 1-2, 4-10 Parkway Station", a plat which is recorded at Book of Maps 1992 at Page 344, both being recorded in the Wake County Registry of Deeds.

Beginning on an iron pipe found on the northern right-of-way of Candun Drive, a 60-foot wide right-of-way recorded at Book of Maps 1992 at Page 344, being a common corner with Lot 6 as shown on the plat entitled "Subdivision Map of Lots 1-2, 4-10 Parkway Station", a plat which is recorded at Book of Maps 1992 at Page 344, a common corner with Phoenix Dawn, LLC, a deed which is recorded at Deed Book 18366 at Page 240, and a point in the center of an Existing 20-foot wide Drainage Easement recorded at Book of Maps 1992 at Page 344, all being recorded in the Wake County Registry of Deeds; said Point of Beginning having the North Carolina State Plane (Grid) coordinates (NAD 83 – 2011) of North 731,851.29 feet and East 2,050,455.27 feet; thence from the Beginning Point and continuing with Lot 6 (BM 1992, Pg. 344), Phoenix Dawn, LLC and the center of an Existing 20-foot wide Drainage Easement for two calls: North 36 degrees 47 minutes 51 seconds West 187.11 feet to an iron pipe found; and North 04 degrees 38 minutes 26 seconds East 209.39 feet to a computed point being located South 04 degrees 38 minutes 26 seconds West 0.55 feet from an iron pipe found, said computed point being located on the northern edge of an Existing 30-foot wide Sanitary Sewer and Access Easement recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds, thence leaving Phoenix Dawn, LLC and continuing with Lot 6 and the northern edge of an Existing 30-foot wide Sanitary Sewer and Access Easement for one call: South 89 degrees 01 minutes 06 seconds East 172.96 feet to an iron pipe found, being a common corner with Lot 6 and the aforementioned Lot 7 (BM 1992, Pg. 344); thence leaving Lot 6 and continuing with Lot 7 and the northern edge of an Existing 30-foot wide Sanitary Sewer and Access Easement for two calls: South 89 degrees 01 minutes 06 seconds East 243.51 feet to an iron pipe found; and South 89 degrees 01 minutes 06 seconds East 0.50 feet to an iron pipe found on the western right-of-way of Laura Duncan Road, a 60-foot wide right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds; thence continuing with Lot 7 and the western right-of-way of Laura Duncan Road for two calls: a curve to the left having a radius of 358.53 feet, an arc length of 227.50 feet and a chord of South 11 degrees 44 minutes 07 seconds West 223.70 feet to an iron pipe set at a point of reverse curve; and a curve to the right having a radius of 30.00 feet, an arc length of 39.43 feet and a chord of South 30 degrees 39 minutes 21 seconds West 36.65 feet to an iron pipe set at a point of tangency being located on the northern right-of-way of Candun Drive, a 60-foot wide right-of-way recorded at Book of Maps 1992 at Page 344; thence continuing with Lot 7 and the northern right-of-way of Candun Drive for one call: South 68 degrees 51 minutes 52 seconds West 152.70 feet to an iron pipe found, being a common corner with Lot 7 and the aforementioned Lot 6 (BM 1992, Pg. 344); thence continuing with Lot 6 and the northern right-of-way of Candun Drive for two calls: South 68 degrees 51 minutes 52 seconds West 103.15 feet to an iron pipe found at a point of curve; and a curve to the left having a radius of 180.00 feet, an arc length of 20.82 feet and a chord of South 65 degrees 35 minutes 53 seconds West 20.81 feet to the Point of Beginning, containing 2.64 Acres by coordinates.

TRACT 3

Being a portion of the property of Old Apex Associates, LP, a deed which is recorded in Deed Book 18823 at Page 715 (Portion of Tract I), being Lots 8, 9 and 10 as shown on the plat entitled "Subdivision Map of Lots 1-2, 4-10 Parkway Station", a plat which is recorded at Book of Maps 1992 at Page 344, both being recorded in the Wake County Registry of Deeds.

Beginning on an iron pipe found at the northeast corner of Lot 10 of "Subdivision Map of Lots 1-2, 4-10 Parkway

Station", a plat which is recorded at Book of Maps 1992 at Page 344, being a common corner in the line with Christopher C. Bode and wife, Amy R. Bode, a deed which is recorded at Deed Book 12382 at Page 2551, a common corner with a Common Area recorded at Book of Maps 2014 at Page 1172, and a point in the eastern edge of an Existing 20-foot wide Drainage Easement recorded at Book of Maps 1992 at Page 344, all being recorded in the Wake County Registry of Deeds; said Point of Beginning having the North Carolina State Plane (Grid) coordinates (NAD 83 – 2011) of North 732,199.28 feet and East 2,050,983.47 feet; thence from the Beginning Point and continuing with Lot 10 (BM 1992, Pg. 344), Common Area and the eastern edge of an Existing 20-foot wide Drainage Easement: South 16 degrees 21 minutes 10 seconds East 170.12 feet, passing a common corner with the Common Area (BM 2014, Pg. 1172) and Laurel Crossing Townhomes Association, Inc, a deed which is recorded at Deed Book 16254 at Page 2741 in the Wake County Registry of Deeds to an iron pipe set, being a common corner with Lot 10 and the aforementioned Lot 9 (BM 1992, Pg. 344); thence continuing along the same bearing with Lot 9 (BM 1992, Pg. 344), Laurel Crossing Townhomes Association, Inc. and the eastern edge of an Existing 20-foot wide Drainage Easement 139.55 feet to an iron pipe set, being a common corner with Lot 9 and the aforementioned Lot 8 (BM 1992, Pg. 344); thence continuing along the same bearing (South 16 degrees 21 minutes 10 seconds East) with Lot 8 (BM 1992, Pg. 344), Laurel Crossing Townhomes Association, Inc. and the eastern edge of an Existing 20-foot wide Drainage Easement 171.08 feet, for a total distance along this bearing of 480.75 feet to an iron pipe found, being a common corner with Lot 8, Laurel Crossing Townhomes Association, Inc., and located on the northern right-of-way of Old U.S. Highway 1 – North Salem Street, a variable width right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds, thence leaving Laurel Crossing Townhomes Association, Inc. and continuing with Lot 8 (BM 1992, Pg. 344), the eastern edge of an Existing 20-foot wide Drainage Easement and the right-of-way of Old U.S. Highway 1 – North Salem Street for one call: South 16 degrees 21 minutes 10 seconds East 8.77 feet to an iron pipe set; thence continuing with Lot 8 and the right-of-way of Old U.S. Highway 1 – North Salem Street for two calls: South 69 degrees 30 minutes 07 seconds West 191.61 feet to an iron pipe set a point of curve; and a curve to the right having a radius of 30.00 feet, an arc length of 47.13 feet and a chord of North 65 degrees 32 minutes 35 seconds West 42.43 feet to and iron pipe set at a point of tangency on the eastern right-of-way of Laura Duncan Road, a variable width right-of-way recorded at Book of Maps 1992 at Page 344 in the Wake County Registry of Deeds; thence continuing with Lot 8 and the eastern right-of-way of Laura Duncan Road for two calls: North 20 degrees 32 minutes 35 seconds West 97.49 feet to an iron pipe set; and North 27 degrees 40 minutes 05 seconds West 40.31 feet to an iron pipe found at the common corner of Lot 8 and the aforementioned Lot 9 (BM 1992, Pg 344); thence continuing with Lot 9 and the eastern right-of-way of Laura Duncan Road for two calls: North 20 degrees 32 minutes 05 seconds West 120.08 feet to an iron pipe set at a point of curve; and a curve to the right having a radius of 298.53 feet, an arc length of 62.75 feet and a chord of North 14 degrees 31 minutes 06 seconds West 62.63 feet to an iron pipe found at a point of curve, being the common corner of Lot 9 and the aforementioned Lot 10 (BM 1992, Pg 344); thence continuing with Lot 10 and the eastern right-of-way of Laura Duncan Road for two calls: a curve to the right having a radius of 298.53 feet, an arc length of 214.94 feet and a chord of North 12 degrees 12 minutes 04 seconds East 210.33 feet to an iron pipe set at a point tangency; and North 32 degrees 39 minutes 25 seconds East 18.87 feet to and iron pipe found, being a common corner with Lot 10, with Rohini Rasakulasuriar, a deed which is recorded at Deed Book 14989 at Page 621, and a point in the northern edge of an Existing 20-foot wide Drainage Easement recorded at Book of Maps 1992 at Page 344, all being recorded in the Wake County Registry of Deeds; thence leaving Laura Duncan Road and continuing with Lot 10 (BM 1992, Pg. 344), Rohini Rasakulasuriar and the northern edge of an Existing 20-foot wide Drainage Easement: South 89 degrees 02 minutes 00 seconds East, passing a common corner with the aforementioned Christopher C. Bode and wife, Amy R. Bode property 136.41 feet to the Point of Beginning, containing 2.71 Acres by coordinates.

TRACT 4

Being a portion of the property of Old Apex Associates, LP, a deed which is recorded in Deed Book 18823 at Page 715 (Tracts Two and Three), being Lots 2 and 3 as shown on the plat entitled "Survey for David J. Martin – Irrevocable Trust, White Oak Township, Wake County N.C." a plat which is recorded at Book of Maps 1992 at Page 1399, both being recorded in the Wake County Registry of Deeds.

Beginning on a railroad spike pipe found on the southern right-of-way of Old U.S. Highway 1 – North Salem Street, a variable width right-of-way recorded at Book of Maps 1992 at Pages 344 and 1399, being in the eastern line of Lot 2 as shown on the plat entitled "Survey for David J. Martin – Irrevocable Trust, White Oak Township, Wake County N.C." a plat which is recorded at Book of Maps 1992 at Page 1399, and a common corner with NC Department of Transportation, a deed which is recorded at Deed Book 1083 at Page 376, all being recorded in the Wake County Registry of Deeds; said Point of Beginning having the North Carolina State Plane (Grid) coordinates (NAD 83 – 2011) of North 731,433.61 feet and East 2,050,545.23 feet; thence from the Beginning Point, leaving the right-of way of Old U.S. Highway 1 – North Salem Street, and continuing with Lot 2 (BM 1992, Pg. 1399) and NC Department of Transportation: South 20 degrees 11 minutes 19 seconds East 66.63 feet to an iron pipe found, being a common corner with Lot 2, NC Department of Transportation and a point on the northern right-of-way of the CSX Railroad, a 100-foot wide right-of-way recorded at Book of Maps 1992 at Page 1399; thence continuing along the same bearing and with Lot 2: 50.50 feet, for a total distance along this bearing of 117.13 feet to a point in the centerline of existing railroad tracks and the 100-foot wide right-of-way; thence continuing with the centerline of the railroad tracks, the 100-foot wide right-of-way and with Lot 2 (BM 1992, Pg. 1399) for seven calls: South 61 degrees 27 minutes 07 seconds West 7.32 feet; South 59 degrees 39 minutes 21 seconds West 99.73 feet; South 58 degrees 33 minutes 33 seconds West 100.99 feet; South 57 degrees 32 minutes 10 seconds West 99.93 feet; South 56 degrees 35 minutes 06 seconds West 98.89 feet to a nail found; South 55 degrees 14 minutes 39 seconds West 61.98 feet; and South 56 degrees 22 minutes 01 seconds West 36.36 feet to a common corner with Lot 2 and the aforementioned Lot 3; thence continuing with Lot 3: South 53 degrees 05 minutes 58 seconds West 433.82 feet to a point in the centerline of existing railroad tracks and the 100-foot wide right-of-way (BM 1992, Pg. 1399); thence leaving the railroad tracks and continuing with Lot 3 (BM 1992, Pg. 1399) North 40 degrees 11 minutes 58 seconds West 49.83 feet to an iron pipe found on the northern right-of-way of the CSX Railroad, a 100-foot wide right-of-way recorded at Book of Maps 1992 at Page 1399, being a common corner with Apex Business Condominium (Common Elements), a deed which is recorded at Deed Book 8973 at Page 442, both being recorded in the Wake County Registry of Deeds ; thence continuing along the same bearing and with Apex Business Condominium and Lot 3: 132.33 feet to an iron pipe set on the southern right-of-way of Old U.S. Highway 1 – North Salem Street, a variable width right-of-way recorded at Book of Maps 1992 at Pages 344 and 1399 in the Wake County Registry of Deeds; thence leaving Apex Business Condominium and the northern right-of-way of Old U.S. Highway 1 – North Salem Street and continuing along the same bearing (North 40 degrees 11 minutes 58 seconds West) with Lot 3: 31.88 feet, for a total distance along this bearing of 214.04 feet to a point within the right-of-way of Old U.S. Highway 1 – North Salem Street; thence continuing with Lot 3: North 55 degrees 34 minutes 06 seconds East 586.26 feet to a point within the right-of-way of Old U.S. Highway 1 – North Salem Street, being common corner with Lot 3 and the aforementioned Lot 2 (BM 1992, Pg. 1399); thence continuing with Lot 2 for six calls within the right-of-way of Old U.S. Highway 1 – North Salem Street: North 62 degrees 12 minutes 17 seconds East 105.71 feet; North 64 degrees 04 minutes 58 seconds East 99.89 feet; North 66 degrees 10 minutes 17 seconds East 100.73 feet; North 67 degrees 55 minutes 16 seconds East 48.46 feet; North 69 degrees 00 minutes 33 seconds East 61.10 feet; and South 20 degrees 11 minutes 19 seconds East 30.01 feet to the Point of Beginning, containing 4.23 Acres by coordinates.

Tract 4 is subject to the right-of-way of Old U.S. Highway 1 – North Salem Street, a variable width right-of-way

recorded at Book of Maps 1992 at Pages 344 and 1399, containing 0.57 acre; and subject to the CSX Railroad, a 100-foot wide right-of-way recorded at Book of Maps 1992 at Page 1399, containing 1.10 acres; resulting in a net area for Tract for of 2.56 acres.

These descriptions are taken from a survey entitled "Plat of ALTA/NSPS Land Title Survey Prepared For CDG Holdings, LLC – A Virginia Limited Liability Company" performed by Seth E. Healy, PLS on the 27th day of August 2021.

TOWN OF APEX UTILITIES OFFER AND AGREEMENT

Application #: 21CZ29 Submittal Date: 12/1/21

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

WAKE COUNTY, NORTH CAROLINA CUSTOMER SELECTION AGREEMENT

North Salem Station

Nine parcels at intersection of Laura Duncan, Candun Drive and North Sale

(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.

Old Apex Associates LP, 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: Old Apex Associates LP	TOWN OF APEX
BY: _____ Authorized Agent	BY: _____ Authorized Agent
DATE: 12/1/21	DATE: _____

WAKE COUNTY PUBLIC SCHOOL SYSTEM

Wake County Residential Development Notification

Developer Company *Information*	
Company *Name*	Old Apex Associates, LP
Company Phone *Number*	434-531-6301
Developer Representative *Name*	Jeff Shifflett
Developer Representative *Phone Number*	434-531-6301
Developer Representative *Email*	jshifflett@castledp.com

New Residential Subdivision *Information*	
Date of Application for Subdivision	12/1/21
City, Town or Wake County Jurisdiction	Town of Apex
Name of Subdivision	North Salem Station
Address of Subdivision (if unknown enter nearest cross streets)	Candun Drive and Laura Duncan Road, Apex, NC 27523
REID(s)	0192936, 0192937, 0192940, 0192939, 0192938, 0192934, 0179933, 0062452, 0025354
PIN(s)	0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, 0743908968

Please complete each section of this form and submit with your application.

Town of Apex staff will enter this information into the online WCPSS form.

Please send any questions about this form to:

studentassignment-gis-group@wcpss.net

Projected Dates *Information*	
Subdivision *Completion Date*	7/1/2025
Subdivision *Projected First Occupancy Date*	1/1/2025

Lot by Lot Development *Information*

Unit Type	Total # of Units	Senior Living	Studio	1 Bedroom	2 Bedroom	3 Bedroom	4 Bedroom	Square Foot Range		Price Range		Anticipated Completion Units & Dates					
								Min	Max	Low	High	Year	# Units	Year	# Units	Year	# Units
Single Family																	
Townhomes																	
Condos																	
Apartments	240			105	111	24		650	1450	1250	2000	2025	240				
Other																	

Revised 08/10/2018

NOTICE OF ELECTRONIC 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.

10/07/2021
Date

Dear Neighbor:
You are invited to an electronic neighborhood meeting to review and discuss the development proposal at

(See Attached) — Address(es)

(See Attached) — PIN(s)

in accordance with the Town of Apex Electronic Neighborhood Meeting procedures. This meeting is intended to be 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. If you are unable to attend, you may contact the applicant before or after the meeting is held. 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. If at all feasible given emergency declarations, limits on in-person gatherings, and social distancing, an additional in-person Neighborhood Meeting may be scheduled and held prior to a public hearing or staff decision on the application.

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

	Application Type	Approving Authority
☒	Rezoning (including Planned Unit Development)	Town Council
☐	Major Site Plan	Town Council (QJPH*)
☐	Special Use Permit	Town Council (QJPH*)
☐	Residential Master Subdivision Plan (excludes exempt subdivisions)	Technical Review Committee (staff)

*Quasi-Judicial Public Hearing: The Town Council cannot discuss the project prior to the public hearing.

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

Rezoning of nine (9) parcels currently PC (Planned Commercial) and B1 (Neighborhoold Business District) to PUD-CZ (Planned Unit Development - Conditional Zoning District) for the development of a multi-family housing community with amenity area.

Estimated submittal date: November 1, 2021

MEETING INFORMATION:

Property Owner(s) name(s):	Jess Achenbach
Applicant(s):	Castle Development Partners
Contact information (email/phone):	jachenbach@castledp.com/434-260-6628
Electronic Meeting invitation/call in info:	Video Link: https://bit.ly/3DA5SYb Audio Only: +1 984-275-4893, Phone Conference ID: 128 973 522#
Date of meeting**:	October 26, 2021, Tuesday
Time of meeting**:	5:00 p.m. - 7:00 p.m.

MEETING AGENDA TIMES:

Welcome: 5:00 - 5:15 pm Project Presentation: 5:15 - 6:15 pm Question & Answer: 6:15 - 7:00 pm

**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.

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: North Salem Station Development Zoning: PC and B1 (Current)

Location: Multiple Parcels- Intersection of Laura Duncan Road and N. Salem Street (See attached)

Property PIN(s): See Attached Acreage/Square Feet: 10.39 acres +/- 452,588 sf

Property Owner: Castle Development Partners

Address: 230 Court Square, Suite 202

City: Charlottesville State: VA Zip: 22902

Phone: 434-260-6628 Email: jachenbach@castledp.com

Developer: Castle Development Partners

Address: 230 Court Square, Suite 202

City: Charlottesville State: VA Zip: 22902

Phone: 434-260-6628 Fax: Email: jachenbach@castledp.com

Engineer: The Wooten Company

Address: 120 North Boylan Avenue

City: Raleigh State: NC Zip: 27603

Phone: 919-828-0531 Fax: 919-834-3589 Email: awadsworth@thewootencompany.com

Builder (if known): N/A

Address:

City: State: Zip:

Phone: Fax: Email:

Please note that Town staff will not have complete information about a proposed development until the application is submitted for review. If you have a question about Town development standards and how they relate to the proposed development, please contact the appropriate staff person listed below.

Town of Apex Department Contacts

Planning Department Main Number (Provide development name or location 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 Jessica Bolin, Senior Engineer (Stormwater, Sedimentation & Erosion Control) Stan Fortier, Senior Engineer (Stormwater, Sedimentation & Erosion Control) James Gregg, Utility Engineer (Water & Sewer)	 (919) 249-3537 (919) 249-1166 (919) 249-3324
Electric Utilities Division Rodney Smith, Electric Technical Services Manager	(919) 249-3342

Providing Input to Town Council:

Each Town Council meeting agenda includes a Public Forum time when anyone is permitted to speak for three (3) minutes on any topic with the exception of items listed as Public Hearings for that meeting. The Town Council meets on the 1st and 3rd Tuesdays of each month at 6:00 p.m. (except for holidays, see schedule of meetings at http://www.apexnc.org/838/Agendas-Minutes). You may also contact Town Council by e-mail at AllCouncil@apexnc.org.

Private Agreements and Easement Negotiation:

The Town of Apex cannot enforce private agreements between developers and neighbors and is not a party to the easement and right-of-way negotiation that occurs between developers and neighboring property owners for easements or rights-of-way that are necessary to build the project.

It is recommended that all private agreements be made in writing and that if a property owner feels it necessary, they should obtain private legal counsel in order to protect their interests in both private agreements and during easement negotiations. The only conditions that the Town of Apex can enforce are those conditions that are made a part of the conditional zoning of the property by agreement of the developer and the Town.

As an example, if a developer offers to build a fence for a neighbor to mitigate some impact, the Town can only enforce the construction of the fence if the fence becomes a condition of the rezoning. This would occur by the developer offering the condition as part of their conditional zoning application package or at the Town Council public hearing on the conditional zoning and the Town accepting it as a condition. Private agreements regarding a fence being constructed will not be enforced by the Town.

To request that any agreement with a developer is made a part of the conditional zoning at the time of approval, you may ask at the Town Council public hearing if the agreement is included in the conditions. If it is not, you may request that the Town Council not approve the rezoning without the agreement being included in the conditions (note that it is up to Town Council whether to approve or deny the rezoning but they cannot impose conditions that the applicant does not agree to add). The developer's proposed conditions can be viewed any time after a rezoning is submitted on the Interactive Development Map at: http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795

Documentation:

Neighbors to a requested new development and/or rezoning are strongly encouraged to fully document (such as through dated photographs) the condition of their property before any work is initiated for the new development. Stormwater controls installed on developed property are not designed to and will likely not remove 100% of the soil particles transported by stormwater runoff. As a result, creeks and ponds could become cloudy for a period of time after rain events.

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.

Noise & Hours of Construction:	Non-Emergency Police	919-362-8661

Noise from tree removal, grading, excavating, paving, and building structures is a routine part of the construction process. The Town generally limits construction hours from 7:00 a.m. to 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.

Construction Traffic:	James Misciagno	919-372-7470

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).

Road Damage & Traffic Control:	Water Resources – Infrastructure Inspections	919-362-8166

There can be issues with roadway damage, roadway improvements, and traffic control. Potholes, rutting, inadequate lanes/signing/striping, 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.

Parking Violations:	Non-Emergency Police	919-362-8661

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.

Dirt in the Road:	James Misciagno	919-372-7470

Sediment (dirt) and mud gets into the existing roads due to rain events and/or vehicle traffic. These incidents should be reported to James Misciagno. He will coordinate the cleaning of the roadways with the developer.

Dirt on Properties or in Streams:	James Misciagno	919-372-7470
	Danny Smith	Danny.Smith@ncdenr.gov

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 James Misciagno at 919-372-7470 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) with the State.

Dust:	James Misciagno	919-372-7470

During dry weather dust often becomes a problem blowing into existing neighborhoods or roadways. These incidents should be reported to James Misciagno at 919-372-7470 so that he can coordinate the use of water trucks onsite with the grading contractor to help control the dust.

Trash:	James Misciagno	919-372-7470

Excessive garbage and construction debris can blow around on a site or even off of the site. These incidents should be reported to James Misciagno at 919-372-7470. He will coordinate the cleanup and trash collection with the developer/home builder.

Temporary Sediment Basins:	James Misciagno	919-372-7470

Temporary sediment basins during construction (prior to the conversion to the final stormwater pond) are often quite unattractive. Concerns should be reported to James Misciagno at 919-372-7470 so that he can coordinate the cleaning and/or mowing of the slopes and bottom of the pond with the developer.

Stormwater Control Measures:	Jessica Bolin	919-249-3537

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.

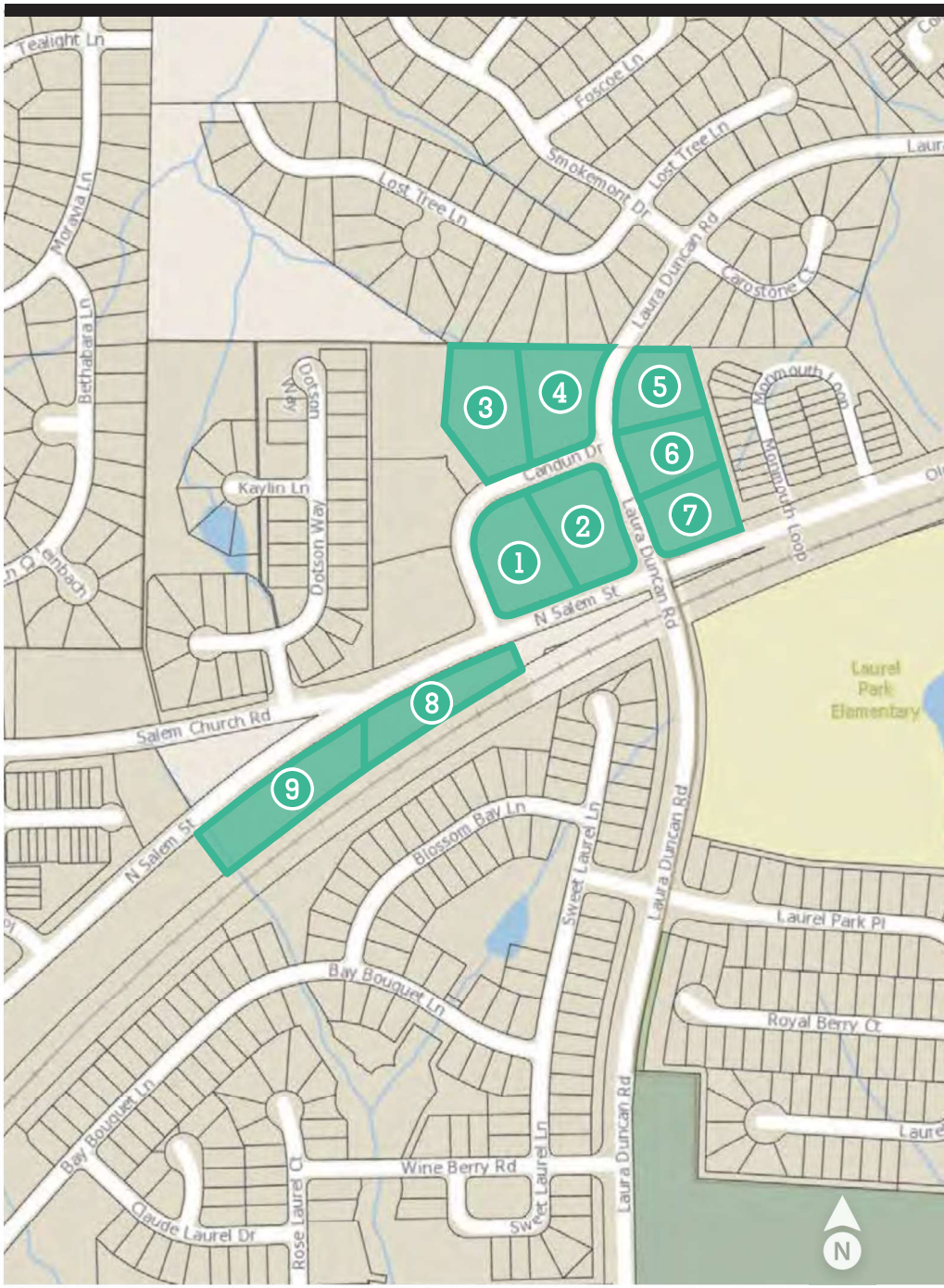
Electric Utility Installation:	Rodney Smith	919-249-3342

Concerns with electric utility installation can be addressed by the Apex Electric Utilities Department. Contact Rodney Smith at 919-249-3342.

Parcel information

	Parcel ID	Land Area	Zoning
1	0753-01-5606 Address: 0 Candun Drive	±1.25 ac	PC
2	0753-01-6795 Address: 0 Candun Drive	±1.25 ac	PC
3	0753-02-4120 Address: 0 Candun Drive	±1.43 ac	PC
4	0753-02-6029 Address: 0 Candun Drive	±1.21 ac	PC
5	0753-02-8181 Address: 0 Laura Duncan Road	±0.90 ac	PC
6	0753-01-9925 Address: 0 Laura Duncan Road	±0.90 ac	PC
7	0753-01-9769 Address: 0 North Salem Street	±0.91 ac	PC
8	0753-01-3228 Address: 0 North Salem Street	±1.00 ac	B1
9	0743-90-8968 Address: 0 North Salem Street	±1.54 ac	B1

county	jurisdiction	total land area
Wake	Apex	± 10.39 ac



SITE INFORMATION

TOTAL SITE AREA (APPROX.) :	8.93 AC
CURRENT ZONING :	PC & B1
PROPOSED ZONING :	PUD
FUTURE LAND USE :	HIGH DENSITY RESIDENTIAL

LEGEND

MULTIFAMILY

- (M1) 4 STORY (TYPE VA) WITH TUCK UNDER GARAGES — TOTAL : 62 UNITS
- (M2) 4 STORY (TYPE VA) WITH TUCK UNDER GARAGES — TOTAL : 76 UNITS
- (M3) 4 STORY (TYPE VA) WITH TUCK UNDER GARAGES — TOTAL : 60 UNITS

TOTAL UNITS : 200
AVG HEATED AREA - MF : 950 SF (APPROX.)
TOTAL PARKING : 300 SPACES (INCLUDING GARAGES)
PARKING RATIO PROVIDED : 1.5 SPACES/DU

AMENITIES

- (C1) MULTIFAMILY CLUB / LEASING — TOTAL : 5,000 SF
- (C2) MAINTENANCE / DOG PARK — TOTAL : 950 SF

GARAGES

- (G) TUCK UNDER GARAGES — TOTAL GARAGE PARKING : 18 SPACES

0 30' 60' 120'

CASTLE DEVELOPMENT PARTNERS

APEX MULTIFAMILY

APEX, NC

DENSITY STUDY • 10-01-2021

CST2021-02

DYNAMIK DESIGN

Owners Tenants within 300' of Property
Provided by Town of Apex

SITE_ADDRE	PIN_NUM	OWNER	ADDR1	ADDR2	ADDR3
219 LOST TREE LN	0753023349	ADOLFIE, ELIZABETH	219 LOST TREE LN	CARY NC 27513-5713	
505 SWEET LAUREL LN	0753018341	ALEXE, CATALIN ALEXE, GEORGIANA	505 SWEET LAUREL LN	APEX NC 27523-9303	
802 NEW DERBY LN	0743914024	ALLEN, DONALD WAYNE JR ALLEN, AMELIA ANN	802 NEW DERBY LN	APEX NC 27523-6409	
1038 MONMOUTH LOOP	0753121113	AMBROSECCHIA, DUSTIN AMBROSECCHIA, VANESA	1038 MONMOUTH LOOP	CARY NC 27513-4864	
104 CAROSTONE CT	0753120285	AMH 2014-3 BORROWER LLC	AMERICAN HOMES 4 RENT	30601 AGOURA RD STE 200	AGOURA HILLS CA 91301-2148
2166 N SALEM ST	0743903511	APEX BUSINESS CONDOMINIUM	YORK PROPERTIES INC	2108 CLARK AVE	RALEIGH NC 27605-1606
820 DOTSON WAY	0743917373	ARAVA, SRINIVAS ARAVA, NAGA VARALAKSHMI	820 DOTSON WAY	APEX NC 27523-7535	
1053 MONMOUTH LOOP	0753122041	BIAN, ZHENGKAI WU, DAN	1053 MONMOUTH LOOP	CARY NC 27513-4873	
1051 MONMOUTH LOOP	0753122033	BILLAKOTA, SRINIVAS BILLA, BABAMANIKYAM	171 WILDFELL TRL	CARY NC 27513-5503	
1064 MONMOUTH LOOP	0753111862	BILLAKOTA, SRINIVAS BILLA, BABAMANIKYAM	400 RAPPORT DR	CARY NC 27519-5586	
102 CAROSTONE CT	0753120215	BODE, CHRISTOPHER C BODE, AMY R	102 CAROSTONE CT	CARY NC 27513-5717	
1042 MONMOUTH LOOP	0753120088	BOWDEN, GEORGE KEVIN TRUSTEE BOWDEN, JOANNE DALY TRUSTEE	1042 MONMOUTH LOOP	CARY NC 27513-4864	
1011 MONMOUTH LOOP	0753113947	BREZNIK, DIANE BUCKLER	1011 MONMOUTH LOOP	CARY NC 27513-4873	
728 BLOSSOM BAY LN	0753003928	BRIDGERS, BRIAN BRIDGERS, SARAH	728 BLOSSOM BAY LN	APEX NC 27523-6801	
1061 MONMOUTH LOOP	0753112961	BROWN, BEVERLY M	1061 MONMOUTH LOOP	CARY NC 27513-4873	
720 BLOSSOM BAY LN	0753014015	CCMA INVESTMENTS LLC	106 SIR WALKER LN	CARY NC 27519-5500	
1008 DOTSON WAY	0753010466	CHAO, MENG-JUI CHEN, LAN-JU	1008 DOTSON WAY	APEX NC 27523-7519	
820 BAY BOUQUET LN	0743907534	CHAUDHARI, ABHIJEET N MAHAJAN, DEEPALI	820 BAY BOUQUET LN	APEX NC 27523-9316	
803 NEW DERBY LN	0743904819	CHHAYA, RAHUL HARSHAD TRUSTEE CHHAYA, MINAL RAHUL TRUSTEE	113 DUMBLEDORE CT	CARY NC 27519-7524	
227 LOST TREE LN	0753021500	COETZER, CHRIS T MARTEL, EMILIE	227 LOST TREE LN	CARY NC 27513-5713	
1120 DOTSON WAY	0753020176	COLE, EMMANUEL B COLE, WINSTONA D	1120 DOTSON WAY	APEX NC 27523-7525	
1048 MONMOUTH LOOP	0753121001	CONTE, DIANE	1048 MONMOUTH LOOP	CARY NC 27513-4864	
1100 DOTSON WAY	0753010888	COOKE, CHERYL B COOKE, QUINTON E	1100 DOTSON WAY	APEX NC 27523-7525	
0 CANDUN DR	0753026029	DAVID J & MARILYN B MARTIN IRREVOCABLE TRUST	1201 BUCK JONES RD	RALEIGH NC 27606-5635	
201 LOST TREE LN	0753028456	DIETZ, JAMES J DIETZ, AMY L	201 LOST TREE LN	CARY NC 27513-5713	
1015 MONMOUTH LOOP	0753123031	DONDAPATI, SURESH DONDAPATI, INDIRA	1015 MONMOUTH LOOP	CARY NC 27513-4873	
0 SWEET LAUREL LN	0753018240	ELLINGTON PLACE APEX HOA INC	C/O ELITE MANAGEMENT PROF	4112 BLUE RIDGE RD STE 100	RALEIGH NC 27612-4652
0 BAY BOUQUET LN	0743906502	ELLINGTON PLACE APEX HOA, INC	4112 BLUE RIDGE RD STE 100	RALEIGH NC 27612-4652	
756 BLOSSOM BAY LN	0753000753	ENGLISH, SCOTT	756 BLOSSOM BAY LN	APEX NC 27523-6801	
215 LOST TREE LN	0753024338	FANNEY, BRIAN HUNTER FANNEY, ALLISON	215 LOST TREE LN	CARY NC 27513-5713	
105 CAROSTONE CT	0753122441	FELICIANO, ISAAC GOMEZ RIVERA, JAYLENE RIOS	105 CAROSTONE CT	CARY NC 27513-5718	
764 BLOSSOM BAY LN	0753000622	FISCHER, KENNETH ALAN FISCHER, JEANNE MARIE	764 BLOSSOM BAY LN	APEX NC 27523-6801	
1050 MONMOUTH LOOP	0753111919	FULLER, NICHEY B	1050 MONMOUTH LOOP	CARY NC 27513-4864	
1052 MONMOUTH LOOP	0753111926	GARCIA, ALFREDO GARCIA, MYRIAM SUSANA	1052 MONMOUTH LOOP	CARY NC 27513-4864	
1116 DOTSON WAY	0753020180	GILREATH, MICHAEL WAYNE	1116 DOTSON WAY	APEX NC 27523-7525	
223 LOST TREE LN	0753022317	GORDON, JAY K GORDON, CYNTHIA G	223 LOST TREE LN	CARY NC 27513-5713	
1104 DOTSON WAY	0753010983	GROVES, SABA GROVES, ISAAC	1104 DOTSON WAY	APEX NC 27523-7525	
1012 DOTSON WAY	0753010583	GRUMET, SURAH AL-MUSSAWIR, HAYF	1012 DOTSON WAY	APEX NC 27523-7519	
0 LAURA DUNCAN RD	0753016421	HALEY FAMILY HSH REALTY LLC	1812 TRINITY RD	RALEIGH NC 27607-4922	
221 LOST TREE LN	0753022397	HEERING, JOHN R HEERING, CAROLYN D	221 LOST TREE LN	CARY NC 27513-5713	
808 BAY BOUQUET LN	0743908682	HOULIHAN, BRANDON FRANCIS HOULIHAN, JESSICA YURI	808 BAY BOUQUET LN	APEX NC 27523-9316	
760 BLOSSOM BAY LN	0753000638	HUNTER, DAMON KEITH HUNTER, SARAH BETH	760 BLOSSOM BAY LN	APEX NC 27523-6801	
106 CAROSTONE CT	0753121254	INGALLS, GREGORY EMERY, JEANETTE	106 CAROSTONE CT	CARY NC 27513-5717	
1058 MONMOUTH LOOP	0753111849	JEFFORDS, TYLER MAX	1058 MONMOUTH LOOP	CARY NC 27513-4864	
740 BLOSSOM BAY LN	0753001990	JENKINS, LESLIE JAYNEA	740 BLOSSOM BAY LN	APEX NC 27523-6801	
724 BLOSSOM BAY LN	0753013061	KABIR, MD ASHFANOOR MAHMUD, MARZANA MANTASHA	724 BLOSSOM BAY LN	APEX NC 27523-6801	
748 BLOSSOM BAY LN	0753001813	KEMPFER, HEATHER ANNE KEMPFER, CHRISTOPHER A	748 BLOSSOM BAY LN	APEX NC 27523-6801	
1605 SALEM CHURCH RD	0743913289	KING, TOMMY KING, NANCY	1605 SALEM CHURCH RD	APEX NC 27523-7566	
1005 MONMOUTH LOOP	0753113879	KIRKPATRICK, BRIAN	1005 MONMOUTH LOOP	CARY NC 27513-4873	
1065 MONMOUTH LOOP	0753112886	KITTRELL, JACQUES ANTHONY KITTRELL, CHARITY SUZETTE	1065 MONMOUTH LOOP	CARY NC 27513-4873	
1000 DOTSON WAY	0743919377	KRISHNAMURTHY, RAMESH RAMESH, SUMATHI	1000 DOTSON WAY	APEX NC 27523-7519	
1016 DOTSON WAY	0753010589	KRISHNAMURTHY, USHA MAHALINGAM, KRISHNAMURTHY	1016 DOTSON WAY	APEX NC 27523-7519	
0 OLD APEX RD	0753116723	LAUREL CROSSING TOWNHOMES ASSOCIATION, INC.	1210 TRINITY RD STE 102	CARY NC 27513-6245	
1027 MONMOUTH LOOP	0753122140	LAUREL CROSSING TOWNHOMES ASSOCIATION, INC.	C/O COMMUNITY ASSOCIATION MANAGEMEN	PO BOX 79032	CHARLOTTE NC 28271-0030
1062 MONMOUTH LOOP	0753111854	LEBETA, KALKIDAN HUNDE HAILEMARIAM, RAHEL ESHETU	1062 MONMOUTH LOOP	CARY NC 27513-4864	
0 SALEM CHURCH RD	0743917152	LEWTER, JOSEPHINE S	1513 TYONEK DR	DURHAM NC 27703-5639	
1021 MONMOUTH LOOP	0753123009	LIU, YAQIN TU, YA PING	306 ALLIANCE CIR	CARY NC 27519-5527	
810 DOTSON WAY	0743917311	LOVELL, CLINTON POWERS JR LOVELL, SANDRA SINISI	810 DOTSON WAY	APEX NC 27523-7535	
1057 MONMOUTH LOOP	0753112964	LUDWICZAK, JAMES A LUDWICZAK, KATHLEEN S	1057 MONMOUTH LOOP	CARY NC 27513-4873	
1112 DOTSON WAY	0753020085	MAMO, DANIEL MAMO, KERRI T	1112 DOTSON WAY	APEX NC 27523-7525	
712 BLOSSOM BAY LN	0753015028	MAYHEW, JONATHAN SCOTT MAYHEW, ROMINA ISABEL	712 BLOSSOM BAY LN	APEX NC 27523-6801	
209 LOST TREE LN	0753026229	MCCLUSKY, DOUGLAS RANDALL PERMANA, SOFIE HARUN	209 LOST TREE LN	CARY NC 27513-5713	
518 SWEET LAUREL LN	0753016173	MCKAY, MICHAEL REYNALDO BROOKS-MCKAY, EMMA	518 SWEET LAUREL LN	APEX NC 27523-9302	
1049 MONMOUTH LOOP	0753122026	MEHTA, NISHANT JASWANTBHAI MEHTA, MANALI NISHANT	1049 MONMOUTH LOOP	CARY NC 27513-4873	
816 BAY BOUQUET LN	0743907588	MILLER, DEAN MILLER, JENNIFER	816 BAY BOUQUET LN	APEX NC 27523-9316	
1028 DOTSON WAY	0753010786	MINSTER, KEITH E MINSTER, JOY B	1028 DOTSON WAY	APEX NC 27523-7519	
217 LOST TREE LN	0753023477	MOXLEY, WESLEY MOXLEY, ROZALINA	217 LOST TREE LN	CARY NC 27513-5713	
801 NEW DERBY LN	0743904849	MUDHAS, ANTONY AROGYA VIJAY SAGAR	801 NEW DERBY LN	APEX NC 27523-6409	
211 LOST TREE LN	0753025330	MUELLER, HORST TRUSTEE MUELLER-PHILIPPIDOU, EFFROSINI TRUSTEE	310 DAVIE LN	CHAPEL HILL NC 27514-5960	
110 CAROSTONE CT	0753123215	MULLER, RAFAEL J SANTIAGO, ANA C	110 CAROSTONE CT	CARY NC 27513-5717	
513 SWEET LAUREL LN	0753018148	NASH, ADAM HUNT NASH, CHRISTINA WALDO	513 SWEET LAUREL LN	APEX NC 27523-9303	

Owners Tenants within 300' of Property
Provided by Town of Apex

SITE_ADDRE	PIN_NUM	OWNER	ADDR1	ADDR2	ADDR3
213 LOST TREE LN	0753024384	NAUPAS, EVA LUZ TINEO	213 LOST TREE LN	CARY NC 27513-5713	
0 N SALEM ST	0753016444	NC DEPT OF TRANSPORTATION	1 S WILMINGTON ST	RALEIGH NC 27601-1429	
804 NEW DERBY LN	0743914004	NEUPANE, JHABINDRA NEUPANE, YAMUNA PANGENI	804 NEW DERBY LN	APEX NC 27523-6409	
732 BLOSSOM BAY LN	0753002976	PAI, HSIU CHU	11325 LEGACY TER	SAN DIEGO CA 92131-3552	
0 LAURA DUNCAN RD	0743928434	PARKWAY COMMUNITY ASSOCIATION INC	OMEGA ASSOCIATION MANAGEMENT INC	160 NE MAYNARD RD STE 210	CARY NC 27513-9676
105 SMOKEMONT DR	0753027534	PATEL, PIYUSH C PATEL, SULBHA P	2308 HANIMAN PARK DR	CARY NC 27513-8324	
1055 MONMOUTH LOOP	0753112958	PATEL, PRAGNESH PATEL, KRISHNA	1055 MONMOUTH LOOP	CARY NC 27513-4873	
812 BAY BOUQUET LN	0743908630	PATEL, RONAK DOLATBHAI PATEL, SUSHMABEN BHARATBHAI	812 BAY BOUQUET LN	APEX NC 27523-9316	
205 LOST TREE LN	0753027363	PAULOVITS, MIKLOS PAULOVITS, MARTA	205 LOST TREE LN	CARY NC 27513-5713	
207 LOST TREE LN	0753026299	PERMANA, SOFIE HARUN	209 LOST TREE LN	CARY NC 27513-5713	
824 BAY BOUQUET LN	0743906590	PETERSON, ERIC M MATHEW, SONI P	824 BAY BOUQUET LN	APEX NC 27523-9316	
2209 CANDUN DR	0753022017	PHOENIX DAWN LLC	2209 CANDUN DR	APEX NC 27523-6404	
514 SWEET LAUREL LN	0753016189	PROKIC, DJORDJE PROKIC, MILJA	514 SWEET LAUREL LN	APEX NC 27523-9302	
1017 MONMOUTH LOOP	0753123024	PULLURU, SANDEEP BAKKI, SHRUTHI	1017 MONMOUTH LOOP	CARY NC 27513-4873	
100 CAROSTONE CT	0753029361	RASAKULASURIAR, ROHINI	1927 MOSTYN LN	APEX NC 27502-6509	
108 CAROSTONE CT	0753122224	REDFORD, NATHAN PROBUS, AMANDA	108 CAROSTONE CT	CARY NC 27513-5717	
225 LOST TREE LN	0753021453	REED, RICHARD B REED, BRIARLY	225 LOST TREE LN	CARY NC 27513-5713	
1024 DOTSON WAY	0753010781	REICHERT, EWA REICHERT, ARTUR	1024 DOTSON WAY	APEX NC 27523-7519	
830 DOTSON WAY	0743918334	RICHARDSON, DONNOVAN KEITH RICHARDSON, CIJI	830 DOTSON WAY	APEX NC 27523-7535	
1032 DOTSON WAY	0753010882	ROBERTSON, GEORGE EDWARD JR ROBERTSON, AGNES HEMMERICH	1032 DOTSON WAY	APEX NC 27523-7519	
509 SWEET LAUREL LN	0753018253	ROBINSON, STEVEN D	509 SWEET LAUREL LN	APEX NC 27523-9303	
204 LOST TREE LN	0753025581	ROCHE, CHRISTOPHER J ROCHE, TIFFANY N	204 LOST TREE LN	CARY NC 27513-5712	
2205 CANDUN DR	0753012727	S & K PARTNERSHIP LLC	1000 DARRINGTON DR STE 105	CARY NC 27513-8134	
203 LOST TREE LN	0753028400	SAAVEDRA, CLAUDIA PATRICIA SMITH, ROBERT SPRUILL	203 LOST TREE LN	CARY NC 27513-5713	
522 SWEET LAUREL LN	0753016068	SALAMONE, JOHN SALAMONE, ABBIE S	522 SWEET LAUREL LN	APEX NC 27523-9302	
804 SALEM POINTE PL	0743903728	SALEM POINTE OWNERS ASSOCIATION INC	REALMANAGE	PO BOX 803555	DALLAS TX 75380-3555
0 NEW DERBY LN	0743819029	SALEM POINTE OWNERS ASSOCIATION INC	8480 HONEYCUTT RD STE 200	RALEIGH NC 27615-2261	
1007 MONMOUTH LOOP	0753113962	SCOTT, CHRISTOPHER	1007 MONMOUTH LOOP	CARY NC 27513-4873	
101 CAROSTONE CT	0753120477	SHI, RUI YANG, CHENMIN	101 CAROSTONE CT	CARY NC 27513-5718	
1004 DOTSON WAY	0753010421	SHIPWASH, ROBERT W SHIPWASH, TERRY F	1004 DOTSON WAY	APEX NC 27523-7519	
1019 MONMOUTH LOOP	0753123026	SHIVALINGAPPA, MAHESH GOWDA, ASHWINI VENKATESHA	1019 MONMOUTH LOOP	CARY NC 27513-4873	
800 DOTSON WAY	0743916332	SHUKLA, SAURABH LAAD, ANAMIKA	800 DOTSON WAY	APEX NC 27523-7535	
1009 MONMOUTH LOOP	0753113955	SKARKA, KRAIG E	1009 MONMOUTH LOOP	CARY NC 27513-4873	
736 BLOSSOM BAY LN	0753002933	SNARE, MICHAEL ALAN JR SNARE, JODI WRIGHT	736 BLOSSOM BAY LN	APEX NC 27523-6801	
206 LOST TREE LN	0753025524	SWIFT, PERCY	206 LOST TREE LN	CARY NC 27513-5712	
103 CAROSTONE CT	0753121453	TEW, COLEMAN A TEW, MARISSA A	103 CAROSTONE CT	CARY NC 27513-5718	
900 DOTSON WAY	0743919920	THE TRACE COMMUNITY ASSOCIATION, INC.	812 SALEM WOODS DR	RALEIGH NC 27615-3346	
805 NEW DERBY LN	0743903899	THIRUNAVUKKARASU, SENTHILNATHAN MURUGANANTHAM, SEETHA	805 NEW DERBY LN	APEX NC 27523-6409	
202 LOST TREE LN	0753026448	THOMPSON, JAMES RAY JR WILLIAMSON, STEPHANIE ANNE	107 ABBOTS GLEN CT	CARY NC 27511-5059	
1046 MONMOUTH LOOP	0753120094	TIRGRATH, MATTHEW R	1046 MONMOUTH LOOP	CARY NC 27513-4864	
0 SALEM CHURCH RD	0743917296	TRACE II HOMEOWNERS ASSOCIATION INC	1210 TRINITY RD STE 102	CARY NC 27513-6245	
1040 MONMOUTH LOOP	0753120191	TUCKER, MICHAEL J DEVITA-TUCKER, CYNTHIA L	1040 MONMOUTH LOOP	CARY NC 27513-4864	
1060 MONMOUTH LOOP	0753111847	VALLURY, APARNA	1060 MONMOUTH LOOP	CARY NC 27513-4864	
1108 DOTSON WAY	0753010989	VALLURY, APARNA KOCHUPARAMBIL, BEJOY J	1108 DOTSON WAY	APEX NC 27523-7525	
708 BLOSSOM BAY LN	0753015088	VENUGOPAL, MAGESH K KONDASWAMY NARAYANASWAMY, MANJU	708 BLOSSOM BAY LN	APEX NC 27523-6801	
1056 MONMOUTH LOOP	0753111932	VISAKOWITZ, SCOTT LINDSTADT, ROBYN	1056 MONMOUTH LOOP	CARY NC 27513-4864	
2450 LAURA DUNCAN RD	0753115217	WAKE CNTY BOARD OF EDUCATION	RE SERVICES DIRECTOR	1551 ROCK QUARRY RD	RALEIGH NC 27610-4145
1063 MONMOUTH LOOP	0753112879	WAN, CHUYANG	1063 MONMOUTH LOOP	CARY NC 27513-4873	
526 SWEET LAUREL LN	0753016053	WANG, JENG JIE WANG, SHU LI	1033 HOLTRIDGE DR	APEX NC 27523-3708	
1608 SALEM CHURCH RD	0743915064	WEAVER, TREVA WILLARD	1608 SALEM CHURCH RD	APEX NC 27523-7565	
1020 DOTSON WAY	0753010685	WOODS, ROBERT L WOODS, TERRI L	1020 DOTSON WAY	APEX NC 27523-7519	
744 BLOSSOM BAY LN	0753001857	YE, QING KANG, RUI	2012 KILLEARN MILL CT	CARY NC 27513-4293	
752 BLOSSOM BAY LN	0753000788	ZHANG, XIAO BING LIN, QING	752 BLOSSOM BAY LN	APEX NC 27523-6801	
716 BLOSSOM BAY LN	0753014068	ZHENG, JIAHUI	1517 CHAMPLAIN CREST WAY	CARY NC 27513-5810	

Owners Tenants within 300' of Property
Provided by Town of Apex

SITE_ADDRE	PIN_NUM	OWNER	ADDR1	ADDR2	ADDR3
		APEX TOWN OF	PO BOX 250	APEX NC 27502	
		Current Tenant	716 Blossom Bay LN	APEX NC 27523	
		Current Tenant	720 Blossom Bay LN	APEX NC 27523	
		Current Tenant	732 Blossom Bay LN	APEX NC 27523	
		Current Tenant	744 Blossom Bay LN	APEX NC 27523	
		Current Tenant	2201 Candun DR	APEX NC 27523	
		Current Tenant	2205 Candun DR	APEX NC 27523	
		Current Tenant	803 New Derby LN	APEX NC 27523	
		Current Tenant	2166 N Salem ST	APEX NC 27523	
		Current Tenant	2172 N Salem ST	APEX NC 27523	
		Current Tenant	2180 N Salem ST	APEX NC 27523	
		Current Tenant	2186 N Salem ST	APEX NC 27523	
		Current Tenant	2190 N Salem ST	APEX NC 27523	
		Current Tenant	526 Sweet Laurel LN	APEX NC 27523	

AFFIDAVIT OF CONDUCTING AN ELECTRONIC NEIGHBORHOOD MEETING 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, Ana Wadsworth, do hereby declare as follows:
Print Name

1. I have conducted an Electronic Neighborhood Meeting for the proposed Rezoning, Major Site Plan, Residential 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 Electronic Neighborhood Meeting.

3. The meeting was conducted via Teams Virtual Meeting (indicate format of meeting) on Oct. 26, 2021 (date) from 5:00pm (start time) to 7:00pm (end time).

4. I have included the mailing list, meeting invitation, attendance 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.

Nov. 30, 2021
Date

By: Ana Wadsworth

STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Elizabeth M. Lorscheider a Notary Public for the above State and County, on this the 30 day of November, 20 21.

SEAL

ELIZABETH M. LORSCHEIDER NOTARY PUBLIC WAKE COUNTY, NC

Elizabeth M. Lorscheider
Notary Public

Elizabeth M. Lorscheider
Print Name

My Commission Expires: May 15, 2025

ELECTRONIC NEIGHBORHOOD MEETING ATTENDANCE SHEET

North Salem Station Castle Development Partners

Date/Time of Meeting: 10/26/2021, 5 pm-7 pm

NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL
Jennifer Ashton			
Jess Achenbach			
Jeff Shiftlett			
Ana Wadsworth			
Drew Howe			
Michael Karpinski			
Brian Bridgers	728 Blossom Bay Lane, Apex NC 27523		
Daniel Jacobson	110 Mint Court, Cary NC 27513		
George Bowden	1042 Monmouth Loop, Cary NC 27513		
Nancy Schipon	202 Kellyridge Drive, Apex NC 27502		
Matthew Tirgrath	1046 Monmouth Loop, Cary NC 27513		
Mike & Diane Stypolkowski	1048 Monmouth Loop, Cary NC 27513		
Mike Stellpflug	117 White Sands Dr, Cary NC 27513		
Scott Meyers	104 Foscoe Lane, Cary NC 27513		
Cindy & Mike Tucker	1040 Monmouth Loop, Cary NC 27513		
Heather & Chris Kempfer			
Allyson Banas	107 Foscoe Lane, Cary NC 27513		
Scott & Robyn Visakowitz	1056 Monmouth Loop, Cary NC 27513		
Rozalina & Wesley Moxley	217 Lost Tree Lane, Cary NC 27513		
Ana Santiago	110 Carostone Court, Cary NC 27513		
Nichey Fuller	1050 Monmouth Loop, Cary NC 27513		
Ryan and Laurel Gordon	118 Carostone Court, Cary NC 27513		
Treva Weaver	1608 Salem Church Rd., Apex NC 27523		
Rafael Muller	110 Carostone Court, Cary NC 27513		
Paras Patel	823 Bay Bouquet Lane, Apex NC 27523		
Matt & Barb Conroy	216 Lost Tree Lane, Cary NC 27513		
Diane Mickelson	1804 Oak Street, Apex NC 27502		
Michael & Megan Berry	113 Lost Tree Lane, Cary NC 27513		

ELECTRONIC NEIGHBORHOOD MEETING ATTENDANCE SHEET

North Salem Station Castle Development Partners

Date/Time of Meeting: 10/26/2021, 5 pm-7 pm

NAME/ORGANIZATION	ADDRESS	PHONE #	EMAIL
Steve Barrett	111 Lock Lomond Circle, Cary NC 27511		
Tammie Cheek	414 Hilltop View St., Cary NC 27513		
Isaac Gomes & Jaylene Rios	105 Carostone Ct., Cary NC 27513		
Jodi & Mike Snare	736 Blossom Bay Lane, Apex NC 27523		
Bob Dascombe	2105 West Marilyn Circle, Cary NC 27523		
Jennifer Ashton			
April Johnson			
Robert Smith	203 Lost Tree Ln., Cary NC 27513		
Sarah Grumet			
Sijing Liu			
Mariea Estrada			
Brian & Lois Magee	237 Lost Tree Ln., Cary NC 27513		
David Moore	113 Smokemont Drive, Cary NC 27513		

SUMMARY OF DISCUSSION FROM THE ELECTRONIC NEIGHBORHOOD MEETING

North Salem Station

October 26, 2021 : 5 pm to 7 pm

Concern #1

<u>Traffic Impacts</u>

- **Most common concern among all residents.**
- **Community expressed traffic is already a major concern along adjacent spans of Laura Duncan Road, Salem Church Road, North Salem Street and Old Apex Road.**

Proposed Mitigation:

- A full Traffic Impact Analysis has been conducted and is part of this rezoning package.
- Based on the findings of that TIA, several improvements to the adjacent roads to accommodate future traffic conditions. See "Right-of-Way Improvements" section above as well as the full TIA attached.
- Additionally, a trip generation comparison was conducted to compare the site trips (traffic) associated with the allowable land uses under the current zoning (Planned Commercial) versus the site trips associated with the future land use (high-density residential) under the proposed re-zoning.
- Based on those preliminary results, the proposed zoning for all parcels north of N. Salem Street / Old Apex Road is expected to generate significantly fewer trips in comparison to the allowable land uses under the current zoning. The full comparison letter is attached to this submittal.
- Land dedication to the Town of Apex is proposed for future traffic circle.
- Parking has been reduced to 1.6 spaces/unit to promote public transit.
- Construction of bus stop to promote public transit.
- Proposed plan will meet Town of Apex's Transportation plan and will include the necessary right-of-way width to accommodate for future roadway improvements.

Concern #2

<u>Stormwater Runoff and Drainage</u>

- **Neighboring property owners expressed concern that the increased impervious area in the development would create water runoff that current drainage conditions are not equipped to handle, creating erosion and flooding issues.**

Proposed Mitigation:

- Design will consider existing drainage patterns and maintain current discharge points.
- Maximum built-upon area will be met (70% or less).
- All new stormwater runoff associated with development will be detained and treated per the Town's nutrient and peak flow requirements.
- All stormwater runoff will be reduced to pre-development conditions to ensure no net increase.
- Stormwater measures will consist of above and underground detention facilitates throughout the site.
- Erosion control devices will be installed per State and Town of Apex Requirements.

Concern #3

Proximity of Development to Neighboring Homes

- **Neighboring property owners to the east expressed concerns about proximity of their homes to the property line and the impact the new apartment buildings will have on their viewshed.**

Proposed Mitigation:

- Setbacks in these areas have been increased more than the 10 foot requirement where feasible.
- A voluntary 60 foot setback has been added to eastern side of the site to reduce the impact to these neighbors.
- Development will preserve existing trees on site to the greatest extent possible.
- A Type A Buffer has been proposed throughout the development for enhanced screening.
- All residential buildings will be a maximum of 4 stories, which has been reduced from the allowed 5-story construction.

Concern #4

Property Devaluation

- **Neighbors to the east expressed concern that the proximity of apartment buildings to their homes will devalue their property values.**

Proposed Mitigation:

- The subject properties were zoned for commercial uses (1986) prior to the development of the nearby subdivisions (Linville Ridge, 1993) (The Trace, 2007) (Laurel Crossing, 2014), and so any possible impact of the proximity

of surrounding neighborhoods to commercial properties has long been factored into the value of nearby residential properties.
- The proposed residential use will have less impact on adjoining/nearby properties than commercial uses permitted under current zoning
- The proposed rezoning will include voluntary building setbacks and increase buffer densities that ensure appropriate transitions to nearby residential uses

Concern #5

Impact on School Capacity

- **Community expressed concerns that the apartment dwellings will lead to more school age children in a school system that is already at or over capacity.**

Proposed Mitigation:
- The proposed residential unit mix will cap 3-bedroom units at 10% of the total unit count.
- Applicant's comparable properties average fewer than .06 school age children per unit.
- In similar projects (4-story, interior corridor) in the market developed by Castle Development Partners, the number of school-aged children is minimal.
- December 2019 (pre-pandemic levels) from applicable schools:
  - Laurel Park Elementary School had a capacity of 854 students and an enrollment of 888 students—operating at 104% of capacity
  - Salem Middle School had a capacity of 1,274 students and an enrollment of 1,027 students—operating at 80% of capacity.
  - Apex High School had a capacity of 2,222 students and an enrollment of 2,158 students—operating at 97% of capacity.
  - None of these three schools are subject to enrollment caps.

Concern #6

Pedestrian Safety

- **As part of the general traffic concern, residents expressed concerns around pedestrian safety resulting from the increased traffic—particularly due to the railroad track and nearby elementary school.**

Proposed Mitigation:

- Currently, sidewalks exist along the western side of Laura Duncan and along the North Salem Street frontage.
- A 10' side path will be added along the eastern side of Laura Duncan to connect with Town of Cary's side path.
- Additional sidewalks, ADA ramps and crosswalks will be added along the perimeter of all parcels to enhance pedestrian connectivity around the development.

Concern #7

Preservation of Existing Field and Open Space

- **The neighboring community has grown accustomed to and enjoys the open field condition of the site currently.**

Proposed Mitigation:

- Current site plan will dedicate 0.7 acres at the northwest corner of the site solely as greenspace. This will be used to count towards the RCA requirement as well as to provide a buffer between the neighboring property.
- 1.17 acres will also be dedicated RCA within the non-residential parcels.

Planned Unit Development

NORTH SALEM STATION DEVELOPMENT

Laura Duncan Road · Candun Drive · North Salem Street

Apex, North Carolina
PUD PLAN

May 03, 2022

CASTLE
DEVELOPMENT PARTNERS

DYNAMIK
DESIGN

Wooten

RKA

NORTH SALEM STATION

Planned Unit Development

Prepared for The Town of Apex, North Carolina

Developer

Castle Development Partners
230 Court Square, Suite 202
Charlottesville, VA 22902

Architect

Dynamik Design
5901 Peachtree Dunwoody Rd.
Building C, Suite 250
Atlanta, GA 30328

Civil Engineer

The Wooten Company
120 N. Boylan Ave.
Raleigh, NC 27603

Traffic Engineer

Ramey Kemp & Associates
120 N. Boylan Ave.
Raleigh, NC 27603

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Appendix

A. Building Elevations
B. Cover Sheet
C. Existing Conditions Sheet
D. Layout Sheet

VICINITY MAP

N

0 400 800 1600 ft

1 inch equals 800 feet

Disclaimer
Maps 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.

PARCEL INFORMATION

Tract 1:
PIN 0753015606
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.25 acres

Tract 2:
PIN 0753016795
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.25 acres

Tract 3:
PIN 0753024120
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.43 acres

PIN 0753026029
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.21 acres

Tract 5:
PIN 0753028181
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 0.90 acres

Tract 6:
PIN 0753019925
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 0.90 acres

Tract 7:
PIN 0753019769
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 0.91 acres

Tract 8:
PIN 0753013228
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.00 acres

Tract 9:
PIN 0743908968
Old Apex Associates LP
230 Court Square
Suite 202
Charlottesville, VA 22902
Area: 1.54 acres

PROJECT DATA

1. **Name of Project:** North Salem Station

2. **Applicant:** Castle Development Partners
   230 Court Square, Suite 202
   Charlottesville, VA 22902

3. **Prepared By:** The Wooten Company
   120 N. Boylan Ave.
   Raleigh, NC 27603

4. **Current Zoning:** PC – Planned Commercial (7 Parcels) and
   B1 - Neighborhood Business (2 Parcels)

5. **Proposed Zoning:** PUD–CZ: Planned Unit Development
   Conditional Zoning

6. **Current 2045 LUM: Designation** High-Density Residential, Apartments Only/
   Commercial Services (7 Tracts- North of N. Salem Street)
   High-Density Residential / Office Employment (2 Tracts- South of N. Salem Street)

7. **Area of Tract(s):** 10.39 Acres

8. **Areas Designated as Mixed Use on 2045 LUM:** 0 Acres

9. **Area of Mixed-Use Property Proposed as Non-Residential:** 0 Acres

10. **Percent of Mixed-Use Areas Proposed as Non-Residential:** 0%

PURPOSE STATEMENT

North Salem Station development site is comprised currently of nine (9) individual parcels. It is intended that some of these parcels be recombined, resulting in a total of six (6) parcels. Of these parcels, three (3) will be dedicated for residential uses, one (1) for non-residential uses, and two (2) for Resource Conservation Area.

The following information provides a brief summary of how the Development Parameters in the Planned Unit Development District (PUD-CZ) will be met:

The proposed uses designated above for each group of parcels, are permitted uses per *§4.2.2 Use Table* in the Town of Apex's UDO.

North Salem Station includes both residential and non-residential parcels. The residential development will consist of multi-family housing with a maximum of 239 units. The non-residential development will consist of a single building with a maximum area of 10,000 SF.

The proposed development has provided dimensional standards that either meet or exceed compliance with the Town of Apex's UDO. In addition, this development will follow all other requirements of the UDO, North Carolina Building Code and North Carolina Fire Code.

Public sidewalks (5') will be constructed along all right-of-way frontages associated with the development. Per the Town's Parks, Recreation, Greenways and Open Space Master Plan, a ten (10) foot side path will also be constructed along the eastern side of Laura Duncan Road. Internal sidewalks with associated crosswalks and ADA accessible ramps throughout the development will be provided to promote a walkable community for residents.

North Salem Station PUD-CZ is consistent with the High-Density Residential, Apartments only Land Use Designation that was adopted in the 2045 LUM in February 2021 and the proposed design is compatible with the uses and character of the surrounding properties.

North Salem Station will provide quality through enhanced materials and design features, as outlined in the Architectural Controls section below. Sample elevations found in this document illustrate a sample of the style of both residential and non-residential development will provide.

The following information provides a brief summary of how this development proposes site-specific standards and conditions consistent with all Conditional Zoning (CZ) District Standards found in the Town of Apex's UDO *§2.3.3 Conditional Zoning Districts*:

The proposed zoning district PUD-CZ is allowed within the High-Density Residential Use per the 2045 Town of Apex's Land Use Map. The development proposes a maximum density of 23 units per acre.

The proposed location of the development is compatible with the character of the surrounding land uses.

Supplemental standards pertaining to multi-family development, as well as the future use of the non-residential parcels will be incorporated into the final design.

Design will adhere to the Town of Apex's design standards to minimize adverse impacts to the surrounding land. Architectural guidelines and controls will ensure that an appropriate aesthetic is incorporated that is consistent with local architecture and maintains a high level of quality. The project will not create any significant or uncommon nuisances to the surrounding properties.

Design will minimize environmental impacts by adhering to all the Town of Apex's site planning requirements and necessary mitigation efforts. The project will designate 20% of the site as RCA and include additional conditions beneficial to environmental impacts such as solar panels, sanitary sewer pump station improvements (if required) and electric vehicle charging stations for residential uses.

The proposed PUD-CZ will not create any unique or uncommon impacts on public facilities. Any impacts to public facilities will be mitigated by public improvements at the property or fees in lieu, as required by the Town of Apex.

The proposed PUD-CZ will meet all applicable guidelines for health, safety, or welfare of the residents of the Town of Apex.

The proposed PUD-CZ is in compliance with the Town of Apex's recommended use for the Property, as determined in the 2045 Land Use Map. Proposed residential and office/flex uses are consistent with adjacent properties. Increased building setbacks have been incorporated on property lines near existing residences.

The proposed PUD-CZ will not create or constitute a nuisance or hazard. A TIA will be included with this application to recommend any traffic impact mitigation improvements necessary because of the CZ use. The project will comply with traffic mitigation improvements, as required by the Town of Apex.

The proposed PUD-CZ will comply with all standards imposed on it by all other applicable provision of this ordinance for use, layout, and general development characteristics.

PERMITTED 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.

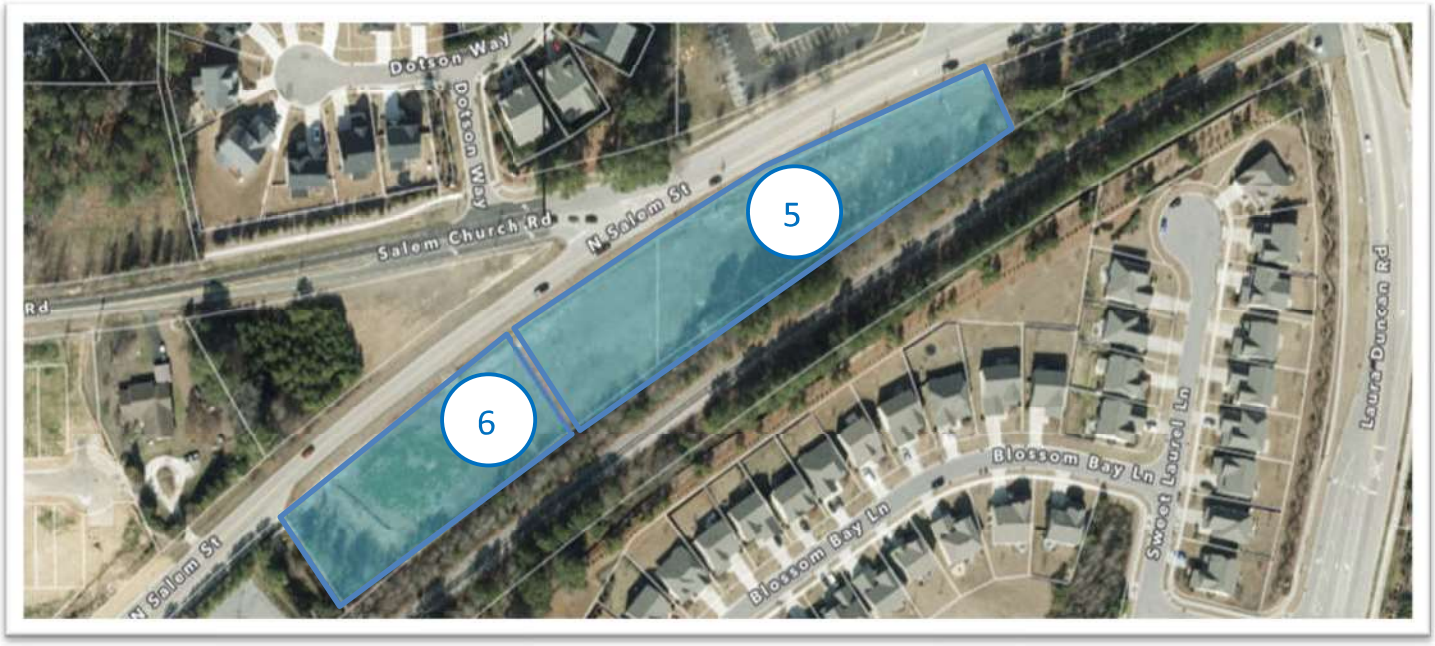
Permitted Residential Use Categories: Parcels 2, 3, and 4	
Multi-Family/Apartment	Utility minor
Condominium	Park, active
Park, passive	Private Recreation Facility

Permitted Non-Residential Use Categories: Parcel 6	
Recreational Uses:	**Food and Beverage Services:**
Park Active/Park Passive	Restaurant, General
Office and Research:	**Industrial Services:**
Medical or Dental Office or Clinic	Woodworking or cabinetmaking
Medical or Dental Laboratory	Manufacturing and processing, minor (S)
Office (Business or Professional)	Microbrewery
Research Facility	Micro Distillery
Retail Sales and Services:	
Artisan Studio	Barber and Beauty Shop
Book Store	Floral Shop
Financial Institution	Grocery, General
Grocery, Specialty	Health/fitness center or spa
Kennel	Printing and copying service
Real estate sales	Retail sales, general
Studio for art	Tailor shop
Upholstery shop	Pet services

SITE DESIGN CONTROLS

Total Site Acreage: 10.39 acres

Residential Use Parcels



1. **Maximum Overall Gross Density** – 23 Units/Acre
2. **Maximum Number of Units** - 239
3. **Maximum Building Height** – 60 feet (Maximum 4 Stories)
4. **Maximum Built Upon Area** –70% of Total Area
5. **Building Setbacks**

Parcel 1	
RCA- No Setbacks	
Parcel 2	
Front:	10 feet (South, Candun Drive)
Side:	20 feet (East, Laura Duncan Drive)
Side:	0 feet (West, Parcel 1)
Rear:	Required Buffer + 5 Feet (North)
Parcel 3	
Front:	50 feet (West, South of Candun Drive) 20 feet (West, North of Candun Drive)
Side:	50 feet (South, Old Apex Road)
Side:	Required Buffer + 5 Feet (North)
Rear:	60 feet (East)

Parcel 4	
Front:	50 feet (South, N. Salem Street)
Side:	50 feet (East, Laura Duncan Road)
Side:	10 feet (West, Candun Drive)
Rear:	10 feet (North, Candun Drive)

6. **Buffers**

Perimeter	
Northern Buffer	10 feet – Type A Buffer
Eastern Buffer	15 feet – Type A Buffer
North Salem Street	30 feet – Type A Buffer*
Western Buffer	0 feet
Laura Duncan Road	0 feet

*The overhead Duke Energy electric easement along North Salem Street shall be counted towards the required buffer standards as identified within various UDO sections. Vegetation planted under the buffer shall be chosen to be 20 feet or less tall, so as to avoid impacting the overhead utility lines.

Non-Residential Use Parcels

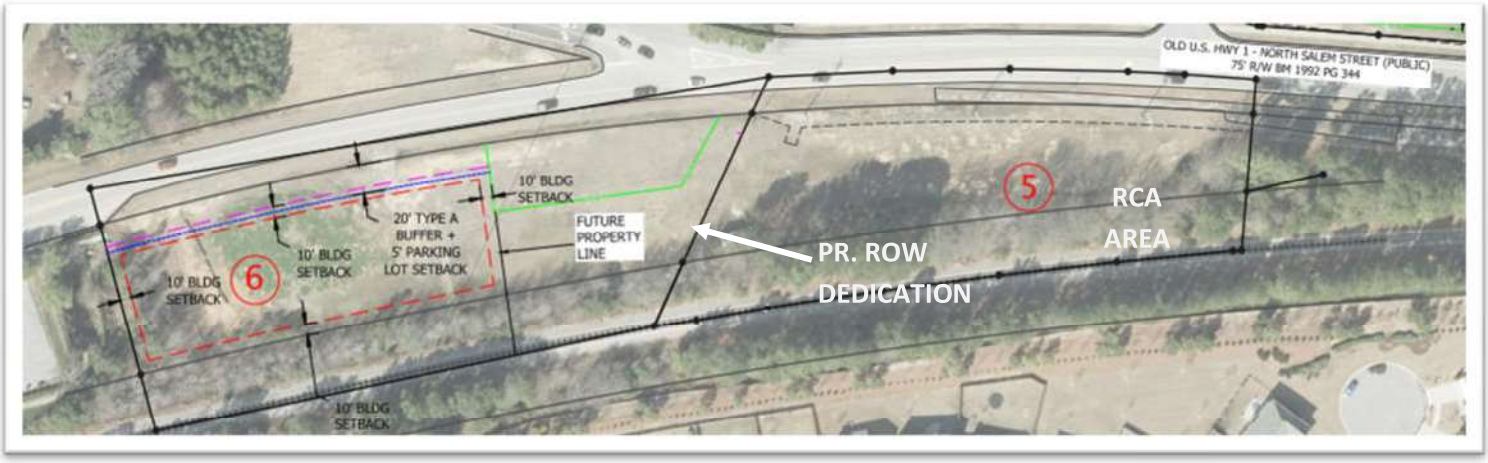
1. **Maximum Building Height** – 40 feet (Maximum 2 Stories)
2. **Maximum Built Upon Area** –70% of Total Area
3. **Maximum Square Footage**- 10,000 SF

4. **Building Setbacks**

Parcel 5	
RCA- No Setbacks	
Parcel 6	
Front:	Required Buffer + 10 feet (North, North Salem St.)
Side:	10 feet
Rear:	10 Feet (South, CSX Rail)

5. **Buffers**

Perimeter	
North Salem Street	20 feet – Type A Buffer
Eastern Buffer	0 feet
Southern Buffer	0 feet
Western Buffer	0 feet



ARCHITECTURAL DESIGN CONTROLS

The proposed development offers the following architectural controls to ensure a consistency of character throughout the development, while allowing for enough variety to create interest and avoid monotony. Elevations included are limited examples of multiple options available. Changes to the exterior materials, roof, windows, doors, process, trim, etc. are allowable with administrative approval at the staff level. Further details shall be provided at the time of Site Plan submittal.

<u>Residential (all product types):</u>

1. Proposed materials and styles will be of a similar palette to provide consistency of character along with visual interest. Exterior materials that may be incorporated into any of the residential buildings include:
    a. Cementitious siding

   b. Wood or synthetic wood siding
   c. Stone or synthetic stone
   d. Brick
   e. Additional building materials may be included with administrative staff approval. Substitute materials shall be allowed by staff approval if the Planning Director determine them to be adequately similar.
2. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
3. For multi-family/apartment buildings, the roofs may be pitched or flat. All other housing types shall have pitched roofs.
4. Siding materials shall be varied in type and/or color on 30% of each facade on each building.
5. Windows that are not recessed must be trimmed.
6. Rooflines cannot be a single mass; they must be varied with the use of gables or parapets.
7. Solar conduit will be provided on all buildings to accommodate the future installation of solar panels.
8. The proposed residential unit mix will cap 3-bedroom units at 10% of the total unit count.

<u>Non-Residential:</u>

1. Architectural treatments such as varying roof forms, façade articulation, breaks in roof, walls with texture materials and ornamental details as well as landscaping shall be incorporated to add visual interest. Large expanses of blank walls, greater than 20 feet in length or height, shall be broken up with windows or other architectural features to reduce visual impacts.
2. Roof features may include flat roofs with parapet, hip roofs or awnings with metal or canvas material.
3. Two (2) or more materials shall be used on each building.
4. Permitted materials include:
   a. Brick, stone, or synthetic stone masonry
   b. Decorative concrete block (integral color or textured)
   c. Stone accents
   d. Aluminum storefront windows/doors with anodized or pre-finished colors
   e. EIFS cornices and parapet trim
   f. EIFS or synthetic stucco shall not be used in the first four feet above grade and shall be limited to 25% of each building facade.
   g. Precast concrete
   h. Cementitious siding
5. Prohibited materials include:
   a. Vinyl siding is not permitted; however, vinyl windows, decorative elements and trim are permitted.
   b. Painted, smooth faced concrete block
   c. Metal Walls. Decorative metal accents and panels may be accepted.
6. Exterior lighting shall not exceed a color temperature of 3,500K and shall meet UDO requirements for full cut off lights.

PARKING AND LOADING

Parking calculations and dimensions for this PUD will comply with UDO Section 8.3 (Off-Street Parking and Loading) of the Town of Apex's Unified Development Ordinance unless otherwise stated in this document.

This development proposes a minimum of 1.3 spaces/residential unit and a maximum of 1.6 spaces/residential unit for all surface lot spaces serving the residential lots. This cap on the maximum parking count was incorporated after discussions with Town Council members and is intended to reduce the number of parking spaces from what the ordinance would require otherwise to maximize green space and promote the use of public transit. The parking count will be based on all unit types and not specify a requirement per number of bedrooms. No more than 10% of the total unit count shall be 3-bedroom units.

As a consideration for the number of residents this development will bring to the area, Castle Development aims to reduce the amount of traffic and promote the use of public transportation by reducing parking spaces on site. The residential development shall construct two bus stops along North Salem Street/Old Apex Road and coordinate the final location with the Town of Apex and Town of Cary in accordance with GoApex and Regional Transit requirements.

Parking associated with the non-residential use lots shall comply with UDO Section 8.3. Bicycle and ADA parking will be provided as required.

A minimum of 5% of the parking spaces shall be Electric Vehicle (EV) Charging spaces. EV charging spaces for the residential development shall be based on the number of parking spaces required by the UDO rather than the reduced parking ratio proposed by the PUD. EV charging spaces shall be provided in either surface or garage lots in accordance with UDO Sec. 8.3.11.

Boat, Boat Trailer, and Recreational Vehicle (RV) parking shall be prohibited on site.

Trash pick-up shall be contracted with a private company and limited to the hours of 7:00 AM to 7:00 PM, Monday through Saturday.

SIGNAGE COMPLIANCE

All signage for this PUD will comply with Section 8.7 (Signs) of the Town of Apex UDO.

NATURAL RESOURCE AND ENVIRONMENTAL DATA

1. **Primary or Secondary Watershed Protection Overlay District –**
   This project is located within the Cape Fear River Basin. Most of the proposed site (parcels north of N. Salem St.) is located within the Secondary Watershed Protection Overlay District as shown on the Town of Apex Watershed Protection Map. The two (2) parcels south of N. Salem St. are located within the Primary Watershed Protection Overlay District. This PUD will comply with section 6.1.7 of the UDO, High-Density Development Option.

2. **FEMA Designated 100 Year Floodplain –**

The proposed PUD site is not located in a designated current or future 100-year floodplain as shown on the Town of Apex FEMA map and FIRM Panels 3720074300J and 3720075300J, effective 5/02/06.

3. **Resource Conservation Area (RCA)**
The PUD will be subject to and meet the requirements of Sections 8.1.2 and 2.3.2 of the Town of Apex UDO. Since the site is located to the east of NC 540, a minimum 20% of the gross site acreage shall be designated as RCA.

RCA BREAKDOWN	
Total Site Area:	**10.39 acres/452,588 SF**
Total RCA Required (20%):	**2.08 acres/90,518 SF**
Total RCA Provided (20.8%):	**2.16 acres/93,944 SF**

Applicant intends to dedicate 0.7 acres of land **(Parcel 1)** at the northwest corner of the site solely for open space/RCA dedication. This land will prohibit construction of any kind. It is currently grassy and will be planted to meet the UDO's requirements for planted RCA.

In addition, approximately 1.17 acres of land located on the south side of North Salem Street **(Parcel 5)** will be dedicated as RCA. The proposed plan will also prohibit construction to occur within this area for the purposes of this development.

The RCA for Parcels 1 and 5 shall be planted and dedicated prior to the last Site Plan Final Plat for the residential portion of the development.

4. **Evidence of Historic Structure On-Site -**
Per the North Carolina State Historic Preservation Office National Historic Places, there are no historic structures present within the proposed project boundary.

STORMWATER MANAGEMENT

The proposed PUD shall meet all stormwater management quality and quantity requirements in accordance with 6.1.7 of the Town of Apex's Unified Development Ordinance.

- Post-development peak runoff shall not exceed pre-development peak runoff for the 24-hour, 1- and 10-year storm events.

- Treatment will be provided for the 1st inch of runoff and will provide a minimum of 85% removal of total suspended solids.

Due to site constraints, stormwater control measures may include, but not be limited to, underground detention systems with NCDEQ approved Storm Filter and Filterra Systems for treatment and bioretention areas and/or construction stormwater wetlands in and around parking lots. If elevation change is feasible, an above ground stormwater detention pond may be added to a portion of the lot on the south side of N. Salem Street. All stormwater control measures shall be approved and designed according to the NCDEQ Design Manual as well as the Town of Apex's UDO.

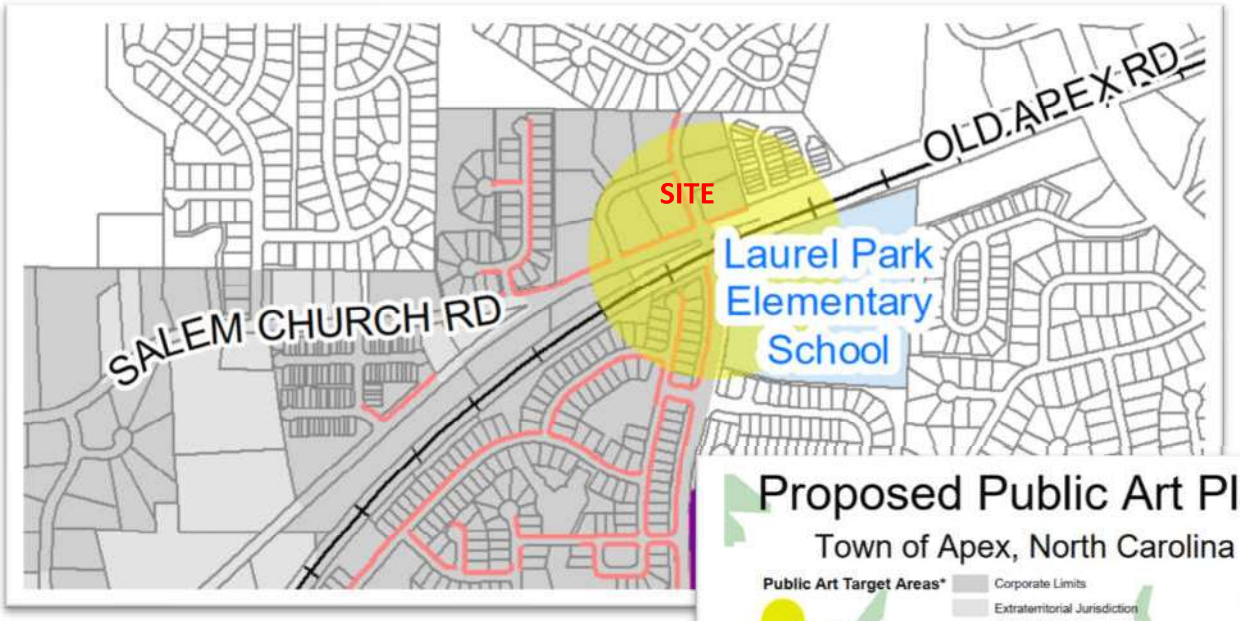
PARKS, RECREATION AND CULTURAL RESOURCES

This PUD proposes a fee-in-lieu of dedication. The rate is based on the time of PUD and PRCR Advisory Commission Approval.

$2,226.05 per multi-family unit

However, per the Town of Apex's Parks, Recreation, Greenways and Open Space Master Plan, a new 'Greenway Trail' is proposed along the Northern Property Boundary (Along Proposed Parcels 1 and 2) and a 'Sidepath' is proposed along the Eastern side of Laura Duncan Drive.

The Parks, Recreation and Cultural Resources Advisory Commission reviewed the project on February 23, 2022. They unanimously recommended a fee-in-lieu of dedication for 240 multi-family units and with credit for construction of greenway trail against fees owed. The timing for the completion of the greenway should be tied to the approval of the final plat. The rate of the fee-in-lieu will be set at the time of Town Council approval. The current 2022 rate of $2226.05 multiplied by the maximum multi-family unit total would result in $534,252.00 of fees deposited with the Town at the time the building permit is approved for issue with greenway construction credit applied first.



<u>Proposed Public Art</u>

The Town of Apex's Public Art Plan designates the area around the intersection of Laura Duncan and North Salem as a "Major Gateway" into Apex. To help promote the Town's Public Art Plan, the Applicant proposes to dedicate an easement for the installation of public art. Location of the art installation will be agreed upon and determined during site plan review.

Application proposes to donate $10,000 to the Citizens for Apex Parks to be allocated towards an art installation to be erected within this development area.

PUBLIC FACILITIES

The proposed PUD shall meet all public facilities requirements in accordance with the Town of Apex's UDO, Advance Apex: The 2045 Transportation Plan, and Standard Specifications and Details.

Roadway Infrastructure

See Right-of-Way Improvements Section of this document for a summary of how proposed roadway infrastructure and right-of-way dedications will be consistent with the Town of Apex's UDO and Transportation Plan.

Pedestrian Connectivity

All sidewalks installed per the Right of Way Improvements section herein shall be a minimum five (5) feet wide to enhance pedestrian connectivity and safety. All sidewalks will include ADA accessible ramps, detectable warning strips and crosswalks where necessary.

A ten (10) foot wide side path along the eastern side of Laura Duncan Road will be constructed in accordance with the Town of Apex's Parks, Recreation, Greenways and Open Space Master Plan.

Water and Sanitary Sewer

All lots within the project will be served by the Town of Apex for water and sanitary sewer. The proposed design will meet the Town's current standard details and specifications for all connections to the public system.

A capacity study is in progress that analyzes existing and proposed wastewater flows. A final report and analysis will be provided to the Town of Apex to determine if any improvements are required. Any upgrades required to the system will be a condition of site plan approval.

A fire flow test will be conducted to analyze current static and residual pressures around the site.

PROJECT PHASING

Phasing for the project shall be determined during site plan or master subdivision plan review and coordinated with the Technical Review Committee.

CONSISTENCY WITH LAND USE PLAN

The proposed land use is consistent with the Advance Apex: 2045 Land Use Map Update.

The 2045 Land Use Map designates the subject parcels to the North of N. Salem St. (2-4) as High-Density Residential, Apartments Only and Commercial Services. The proposed land use for these parcels is High-Density Residential, which is consistent with the Land Use Map designation.

The 2045 LUM designates the subject parcels to the South of N. Salem St. as High-Density Residential and Office Employment. The proposed land uses designated for parcel 6 are consistent with those listed in the zoning districts under Office Employment. Those uses are consistent with the 2045 Land Use Map designation.

COMPLIANCE WITH UNIFIED DEVELOPMENT ORDINANCE

The proposed PUD-CZ and associated development is consistent with all applicable requirements of the Town's Unified Development Ordinance.

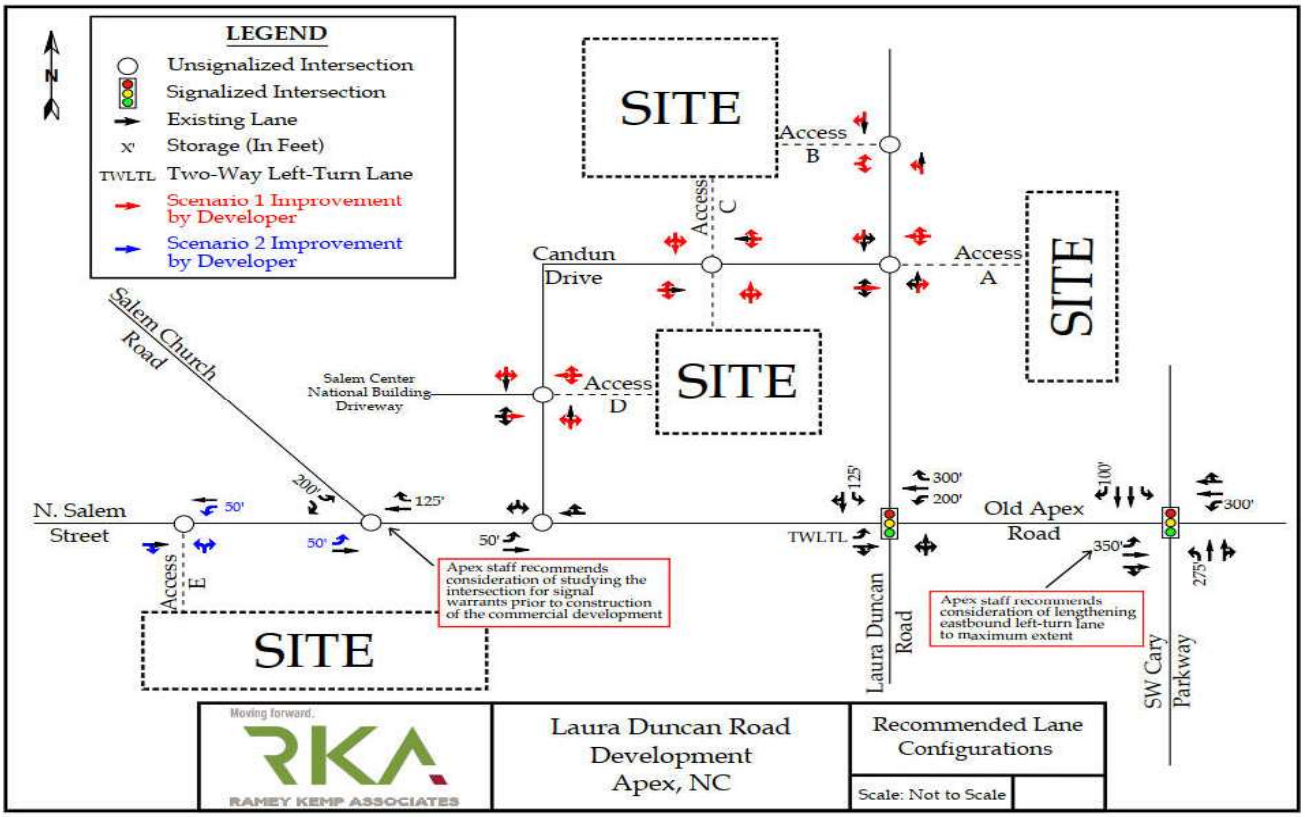
RIGHT-OF-WAY IMPROVEMENTS

The following recommendations were provided as part of the Traffic Impact Analysis (TIA) prepared by Ramey Kemp and Associates in November of 2021. Refer to the figure below for an illustration of the recommended lane configuration. The full TIA is provided as an attachment to the PUD re-zoning submittal.

1. **Laura Duncan Road and Candun Drive/Access A:**
    a. Construct the westbound approach with one ingress and one egress lane.
    b. Provide stop control for the westbound approach.
2. **Laura Duncan Road and Access B:**
    a. Construct the eastbound approach with one ingress and one egress lane.
    b. Provide Stop control for the eastbound approach.
3. **Laura Duncan Road and Access C:**
    a. Construct the northbound and southbound approaches with one ingress and one egress lane.
    b. Provide Stop control for the northbound and southbound approaches.
4. **Laura Duncan Road and Access D:**
    a. Align access D with existing driveway on Candun Drive.
    b. Construct the westbound approach with one ingress and one egress lane.
    c. Provide Stop control for the westbound approach.
5. **North Salem Street and Access E (Will Complete for the Development of the Non-Residential Lots):**
    a. Provide an exclusive westbound left-turn lane with a minimum of a 50' storage lane and appropriate deceleration and taper on North Salem Street.
    b. Construct the northbound approach with one ingress and one egress lane.
    c. Provide stop control for the northbound approach.
6. **North Salem Street and Salem Church Road (Will Complete for the Development of the Non-Residential Lots):**
    a. Construct an exclusive eastbound left turn lane with a minimum of a 50' storage lane and appropriate deceleration and taper on North Salem Street.
7. **Old Apex Road and SW Cary Parkway**
    a. The Town of Apex staff recommends consideration of lengthening eastbound left-turn lane to maximum extent. Developer will consider these improvements only if NCDOT requires only grinding of existing paint lines, not mill and overlay of full roadway width.

8. **<u>North Salem Street and Laura Duncan Road (Will Complete for the Development of the Non-Residential Lots):</u>**

   a. Provide an exclusive eastbound right-turn lane along North Salem Street approaching Laura Duncan Road per NCDOT request, along with the associated signal modification / revised signal plan.



TRANSPORTATION ZONING CONDITIONS

1. All proposed driveway access and improvements on state-maintained roadways are subject to NCDOT review and approval.
2. All development frontage improvements along North Salem Street shall be based on a minimum 41’ back-to-back 3-lane roadway on 80’ right-of-way. As part of the non- residential site plan, a maximum of one (1) access point shall be proposed on North Salem Street, to be located west of Salem Church Road and serving the south parcel.
3. All development frontage along Laura Duncan Road shall include a 5’ sidewalk on the west side and 10’ Side Path on the east side. A maximum of two (2) access points shall be proposed, one located north of Candun Drive serving the west side and one across from Candun Drive serving the east side.
4. All development frontage along both sides of Candun Drive shall include a 5’ sidewalk. A maximum of three (3) access points shall be proposed, two located across from each other west of Laura Duncan Road serving the north and south side and one north of North Salem Street serving the east side.

5. Developer shall provide a 50’ building setback along Laura Duncan Road from North Salem Street to Candun Drive and along the entire development frontage of North Salem Street in consideration of the planned grade separation of Laura Duncan Road at the railroad tracks.
6. Developer shall perform a warrant study for the intersection of Salem Church Road at North Salem Street if directed by Apex staff prior to site plan approval of the non-residential parcel south of North Salem Street and install a traffic signal if determined by warrant study and required by NCDOT. If not required at that time, developer shall have no future responsibility for a traffic signal.
7. Developer will dedicate a maximum of 0.24 acres of additional right of way as shown on the Site Layout based on a conceptual future single-lane roundabout at the intersection of North Salem Street and Salem Church Road.
8. At the time of constructing driveway access to the non-residential parcel located south of North Salem Street, developer shall widen North Salem Street to provide a two-way left-turn lane (TWLTL) between the driveway access and Salem Church Road serving left turns at both intersections.
9. Prior to the first Site Plan Final Plat for the residential parcels, Developer shall lengthen the eastbound left turn lane on Old Apex Road approaching Cary Parkway to the maximum extent possible by restriping the existing painted median island for additional storage length only if NCDOT allows this work to be done without milling and asphalt overlay. If NCDOT requires milling and asphalt overlay then this work shall not be required of the Developer.
10. Developer shall construct two bus stops per Town of Apex standards with amenity pad, bench, bicycle parking, and trash receptacle. Bus stops shall be constructed to accommodate a shelter, but shelters shall not be provided by the applicant. The bus stops shall be paired, to serve both sides of North Salem Street, the final location to be determined by Apex staff during site plan review. If needed, a Transit Access Easement shall be provided for public access to the bus stops.

ADDITIONAL RIGHT-OF-WAY IMPROVEMENTS

Currently, sidewalks exist along the western side of Laura Duncan and along the North Salem Street frontage. A 10’ side path will be built along the eastern side of Laura Duncan to connect with Town of Cary’s side path. During construction of the residential development, the developer shall ensure that a safe, paved pedestrian route shall be maintained from Linville Ridge Subdivision to Laurel Park Elementary School.

Prior to the residential final plat, additional sidewalks, ADA ramps and crosswalks will be added along the street frontage of all residential parcels to enhance pedestrian connectivity around the development. A sidewalk along the south side of North Salem Street will be constructed from the intersection of Laura Duncan Road westward to the proposed bus stop located on the south side of North Salem Street. If approval of the bus stop and/or sidewalk on the south side of North Salem Street is not permitted by CSX Railroad, NCDOT and/or the Town of Cary, installation of this sidewalk will not be a condition of this rezoning and will not prohibit or delay any approvals or permits of the residential development.

Prior to the non-residential final plat, a sidewalk will be constructed along the property frontage of Lots 5 and 6, continuing eastward to the proposed bus stop located on the south side of North Salem

Street. If approval of the bus stop and/or sidewalk on the south side of North Salem Street is not permitted by CSX Railroad, NCDOT and/or the Town of Cary, installation of this sidewalk will not be a condition of this rezoning and will not prohibit or delay any approvals or permits of the non-residential development.

At the intersection of Laura Duncan Road and North Salem Street, applicant shall install remaining two legs of the crosswalk with construction of the residential parcels. If approval of both (two) legs of the crosswalk are not permitted by CSX Railroad, NCDOT and/or Town of Cary, applicant will attempt approval of a single leg of crosswalk; if approval of a single leg of the crosswalk is not permitted by CSX Railroad, NCDOT and/or Town of Cary, installation of crosswalks at the intersection of Laura Duncan Road and North Salem Street will no longer be a condition of this rezoning and will not prohibit or delay any approvals or permits of the residential or non-residential developments.

Future right-of-way and/or easement dedication (Developer is flexible on locations) is provided as a part of this proposal for the following:

- Two Bus Stop Locations to promote public transportation (Along N. Salem St.)
- Future Traffic Circle near the N. Salem St. and Salem Church Rd. intersection. (This will be dedicated prior to non-residential final plat).
- Public Art Installation

ENVIRONMENTAL ADVISORY BOARD RECOMMENDATIONS

The following environmental commitments were discussed and approved by the Apex Environmental Board on August 19, 2021. This summary describes each concern and how the applicant plans to address these recommendations.

#1: Project shall apply for sustainable building certification.
Response: The residential parcels shall apply for the National Green Building Standard Certification at the Bronze level and will be designed and constructed to meet those standards. The application process would begin at the start of architectural design for the residential buildings). The Certification would be obtained within 1 year of the building Certificate of Occupancy. A third-party energy management consultant will be contracted as a part of the design team to ensure that the standards are met.
#2: Pet waste stations shall be installed throughout the neighborhood.
Response: Pet waste stations shall be installed at 3 or more locations throughout the development.
#3: Site shall include electric vehicle charging stations.
Response: A minimum of 5% of the parking spaces shall be Electric Vehicle (EV) Charging spaces. EV charging spaces for the residential development shall be based on the number of parking spaces required by the UDO rather than the reduced parking ratio proposed by the PUD. EV charging spaces shall be provided in either surface or garage lots in accordance with UDO Sec. 8.3.11.
#4: Follow the International Dark Sky Association compliance standards.
Response: International Dark Sky Association Compliance Standards is already intended for this project, as this is a standard practice at all Castle Development sites. a. Outdoor lighting shall be shielded in a way that focuses lighting to the ground.

b. Lighting that minimizes the emission of blue light to reduce glare shall be used.
c. Lighting with a color temperature of 3000K or less shall be used for outside installations.

#5: Reserve pervious surface areas for residents with pets.

Response: Since the EAB has reviewed the conceptual site plan, additional green space has been added to designate a dog park within the community.

#6: Recommendation of decreasing housing density to accommodate the following:

- **Double the set-back from N. Salem Street/Old Raleigh to accommodate a minimum 30-foot-wide "A" type buffer.**
- **Provide an "A" type buffer around the remainder of the development.**
- **Use canopy trees in the parking lot and add six trees internal to the lot.**
- **Add a retention pond that will serve a 25-year storm with maximum residual volume allowed for the pond surface area.**

Response:

- All setbacks and buffers have been adjusted to provide an appropriate width and screening for surrounding streets and properties. A 30' wide Type A Buffer and a 50' Building Setback have been added along the street frontage of N. Salem Street.
- Type A Buffers have been added to the remainder of the development.
- If site design allows, applicant agrees to install additional trees where appropriate.
- Due to site constraints, an underground detention system with other surface stormwater control measures will be proposed to detain and treat runoff from the 1- and 10- year/24-hour storm events.

#7: Install solar PV systems on the south facing rooftops of a minimum size that will support the common electrical energy requirements. This includes the recreational room and pool. If there is additional rooftop available, install solar energy PV systems that provide electricity to individual apartments.

Response:

- Applicant will install Solar PV System (minimum 4KW DC Solar PV System). to power community clubhouse building in residential area.
- Solar conduits will be installed in all residential buildings for future PV systems.

TOWN OF APEX'S SUGGESTED CONDITIONS

In previous meetings, the Town Council has expressed several areas of concern. Below is a summary of how the applicant plans to address some of these concerns.

Concern #1: Affordable Housing

Response:
To support the need for affordable housing within the Town of Apex, the Developer proposes that for a minimum affordability period of five (5) years from the issuance of the first residential certificate of occupancy (the "Affordability Period), at least eight (8) residential dwelling units built on the Property shall be designated as affordable low-income restricted rental units (the "Affordable Dwelling Units"). The Affordable Dwelling Units shall be rented to and occupied by low-income households during the Affordability Period at maximum rent limits per bedroom size and income limits adjusted for family size, no greater than sixty percent (60%) of the Raleigh, NC Metropolitan Statistical Area (MSA) Area Median Income

(AMI) as most recently published by the U.S. Department of Housing and Urban Development (HUD) and stipulated by the most recently published North Carolina Housing Finance Agency (NCHFA) Low-Income Housing Tax Credit (LIHTC) Multifamily Tax Subsidy Program (MTSP) income and rent limits for the Wake Metropolitan area. Allocation of the Affordable Dwelling Units between 1, 2 and 3-bedroom units will be at the discretion of the Developer, so long as a minimum of eight (8) of the Project's total residential dwelling units are maintained as Affordable Dwelling Units. During the Affordability Period, the Developer shall be responsible for performing all property management and administration duties for the Affordable Dwelling Units. Following completion of the Affordability Period, this affordable housing condition shall expire, the Developer shall be relieved of all obligations set forth in this affordable housing condition, and the Affordable Dwelling Units may be freely marketed and leased at market-rate rents. A restrictive covenant (i.e. affordable housing agreement) between the Town and Applicant shall be recorded against the property prior to the first Certificate of Occupancy to memorialize the affordable housing terms and conditions of the approved zoning condition.

Concern #2: Tree Preservation

Response:
The existing site is mostly clear. However, areas around the perimeter include natural vegetation. A tree survey will be conducted to ensure the species and size of trees surrounding the site. Areas within a portion of the landscape buffers will be used for RCA. Any cleared areas designated as RCA shall be planted to the standards listed in the UDO.
A Type A Buffer is also proposed for all landscape buffers throughout the site. Although not anticipated, any existing trees greater than 18" in diameter that are removed by site development shall be replaced by planting a 1.5" caliper native tree from the Town of Apex Design and Development Manual either on-site or at an alternative location approved by Town Planning Staff, beyond standard UDO requirements.
Landscape will follow the Town's UDO to provide the required plantings on site throughout the development, as well.

Concern #3: Solar Energy

Response:

- Lots 2-4: The residential clubhouse building will incorporate a solar PV system (minimum 4KW DC Solar PV System). Solar conduits will be included in all residential buildings for potential future installations. All solar installation required by this condition shall be completed or under construction prior to the final building Certificate of Occupancy.
- Lot 6: No solar PV system requirement included.

NEIGHBORHOOD CONCERNS

Concern #1: Traffic Impacts
Most common concern among all residents.
Community expressed traffic is already a major concern along adjacent spans of Laura Duncan Road, Salem Church Road, North Salem Street and Old Apex Road.

Response/Proposed Mitigation:

- A full Traffic Impact Analysis has been conducted and is part of this rezoning package.
- Based on the findings of that TIA, multiple improvements are proposed accommodate future traffic conditions. See "Right-of-Way Improvements" section above as well as the full TIA attached.
- Additionally, a separate TIA was conducted to compare the traffic impact of multiple by-right scenarios (office/commercial) to the proposed rezoned use (high-density residential).

- Based on the TIA findings, the proposed high-density residential development will generate significantly less traffic impact than if the properties were to be developed per the in-place, By-Right zoning designations. See full finding of traffic engineer's study attached to this submittal.

- Land shall be dedicated to the Town of Apex for a future traffic circle at Salem Church Road and North Salem St.
- Parking has been reduced to a minimum of 1.3 spaces per unit and a maximum of 1.6 spaces/unit to promote public transit.
- The project shall construct two bus stops to promote public transit.
- The proposed plan shall meet Town of Apex's Transportation plan and will include the necessary right-of-way width to accommodate for future roadway improvements.

Concern #2: Stormwater Runoff and Drainage
Neighboring property owners expressed concern that the increased impervious area in the development would create water runoff that current drainage conditions are not equipped to manage, creating erosion and flooding issues.

Response/Proposed Mitigation:

All Stormwater Control Measures and Erosion Control Measures will be designed to comply with the following:

- NC DEQ and Town of Apex standards and requirements
- Design will consider existing drainage patterns and maintain current discharge points.
- Maximum built-upon area will be 70% or less.
- All new stormwater runoff associated with development will be detained and treated per the Town's nutrient and peak flow requirements.
- All stormwater runoff will be reduced to pre-development conditions to ensure no net increase.
- May consist of above and underground detention facilities throughout the site. The best SCM will be chosen once design has begun.
- By-Right development of the site would have an equal or greater amount of impervious area.

Concern #3: Proximity of Development to Neighboring Homes
Neighboring property owners to the east expressed concerns about proximity of their homes to the property line and the impact the new apartment buildings will have on their viewshed.

Response/Proposed Mitigation:

- Setbacks in these areas have been increased more than the 10-foot requirement where feasible.
- A voluntary 60-foot building setback has been added to eastern side of the site to reduce the impact to these neighbors.
- Development will preserve existing trees and plant additional trees on site to the greatest extent possible.
- All buffer types have been upgraded to a Type A Buffer surrounding the development for enhanced screening.
- All residential buildings will be a maximum of 4 stories, which has been reduced from the allowed 5-story construction.

Concern #4: Property Devaluation

Neighbors to the east expressed concern that the proximity of apartment buildings to their homes will devalue their property values.

Response/Proposed Mitigation:

- The subject properties were zoned for commercial uses in 1986, prior to the development of the nearby subdivisions (Linville Ridge, 1993) (The Trace, 2007) (Laurel Crossing, 2014)—therefore, development of these properties has been anticipated for as long as any of the homes have existed.
- The home devaluation concern reflects comparing the current home values (with an undeveloped field) to future home values (developed with apartments).
    - Future home values inclusive of a By-Right development should also be considered—By-Right development could include strip malls, gas stations, fast food drive-throughs, car washes, auto service stations and other businesses that are typically regarded as more obtrusive than apartments.
- The proposed rezoning will include voluntary building setbacks and increased buffer densities that ensure appropriate transitions to nearby residential uses.

Concern #5: Impact on School Capacity
Community expressed concerns that the apartment dwellings will lead to more school age children in a school system that is already at or over capacity.

Response/Proposed Mitigation:

- The proposed residential unit mix will cap 3-bedroom units at 10% of the total unit count.
- Applicant's comparable properties average fewer than .06 school age children per unit, which would yield 10-14 school age children at the proposed community.
- In similar projects (4-story, interior corridor) in the market, the number of school-aged children is further reduced.
- December 2019 (pre-pandemic levels) from applicable schools:
    - Laurel Park Elementary School had a capacity of 854 students and an enrollment of 888 students—operating at 104% of capacity
    - Salem Middle School had a capacity of 1,274 students and an enrollment of 1,027 students—operating at 80% of capacity.
    - Apex High School had a capacity of 2,222 students and an enrollment of 2,158 students—operating at 97% of capacity.
    - None of these three schools are subject to enrollment caps.
- **Wake County Public School System has reviewed the proposed rezoning application through the Wake County Residential Development Notification Database and has confirmed that schools at all grade levels with the current assignment area for the proposed rezoning/development are anticipated to have sufficient capacity for future students.**

Concern #6: Pedestrian Safety
As part of the general traffic concern, residents expressed concerns around pedestrian safety resulting from the increased traffic—particularly due to the railroad track and nearby elementary school.

Response/Proposed Mitigation:

- Currently, sidewalks exist along the western side of Laura Duncan and along the north side of North Salem Street.
- During construction of the residential development, the developer shall ensure that a safe, paved pedestrian route shall be maintained from Linville Ridge Subdivision to Laurel Park Elementary School.
- A 10' side path will be added along the eastern side of Laura Duncan to connect with Town of Cary's side path.
- At the time of the development of the residential parcels, additional sidewalks (5'), ADA ramps and crosswalks will be added along the street frontage of all residential parcels to enhance pedestrian connectivity around the development. A sidewalk along the south side of North Salem Street will be constructed from the intersection of Laura Duncan Road westward to the proposed bus stop located on the south side of North Salem Street. If permission is not granted by CSX Railroad, installation of this sidewalk will not be a condition of this rezoning.
- Prior to non-residential final plat, a sidewalk will be constructed along the property frontage of Lots 5 and 6, continuing eastward to the proposed bus stop located on the south side of North Salem Street.
- At the intersection of Laura Duncan Road and North Salem Street, applicant shall install remaining 2 legs of the crosswalk with construction of the residential parcels. Additional crosswalks shall only be constructed if permitted by CSX Railroad, NCDOT and Town of Cary. Applicant recognizes that access to bus stop south of North Salem Street is critical and willing to install only one leg if both are not approved by governing parties.
- TIA analysis shows that By-Right development of the site would generate a higher traffic count and therefore greater potential impact on pedestrian safety.
- Site will be designed and constructed in full compliance with the traffic impact analysis, the Town of Apex and NCDOT's review and requirements.

Concern #7: Preservation of Existing Field and Open Space

The neighboring community has grown accustomed to and enjoys the open field condition of the site currently.

Response/Proposed Mitigation:

- Proposed site plan will dedicate 0.7 acres at the northwest corner of the site (Parcel 1) solely as greenspace. This will be used to count towards the RCA requirement as well as to provide a buffer between the neighboring property.
- 1.17 acres will also be dedicated RCA within the non-residential parcels (Parcel 5).The subject properties have been zoned for development since 1986, in one of the fastest growing MSAs in America—development of these properties, By-Right or otherwise, is unavoidable.

APPENDIX

REVISIONS

PROGRESS DRAWING
DO NOT USE FOR CONSTRUCTION

CASTLE DEVELOPMENT PARTNERS

APEX, NORTH CAROLINA

NORTH SALEM STATION

MARCH 2022

PROJECT DATA TABLE:

NAME OF PROJECT: NORTH SALEM STATION

PREPARED BY: THE WOOTEN COMPANY
919-828-0531
120 N BOYLAN AVE
RALEIGH, NC

OWNER: OLD APEX ASSOCIATES LP
230 COURT SQUARE SUITE 202
CHARLOTTESVILLE, VA 22902

PURCHASER: CASTLE DEVELOPMENT PARTNERS
230 COURT SQUARE, SUITE 202
CHARLOTTESVILLE, VA 22902

CURRENT 2045 LAND USE:	HIGH DENSITY RESIDENTIAL
PROPOSED 2045 LAND USE:	HIGH DENSITY RESIDENTIAL
AREA OF TRACT(S):	10.39 AC
AREA DESIGNATED AS MIXED USE OF 2045 LUM:	0 SF/0%
AREA OF MIXED USE PROPERTY PROPOSED AS NON-RESIDENTIAL DEVELOPMENT:	0 SF
PERCENT OF MIXED USE AREA PROPOSED AS NON-RESIDENTIAL DEVELOPMENT:	0%
EXISTING AND PROPOSED GROSS SQUARE FOOTAGE OF BUILDINGS:	EX.: 0 SF
PROPOSED GROSS SQUARE FOOTAGE BY FLOOR AREA:	MULTIFAMILY: APPROX. 275,000 SF (TOTAL, 4 STORIES) COMMERCIAL/OFFICE: APPROX. 10,000 SF (TOTAL)
PROPOSED HEIGHT OF THE BUILDING AND NUMBER OF STORIES:	60' & MAX OF 4 STORIES (RESIDENTIAL) 40' & MAX OF 2 STORIES (NON-RESIDENTIAL)
MAXIMUM OVERALL GROSS DENSITY:	23 UNITS/ACRE
NUMBER OF PARKING SPACES REQUIRED:	MAXIMUM 1.6 SPACES PER UNIT (239 UNITS) = 382 MINIMUM 1.3 SPACES PER UNIT (239 UNITS) = 311
REQUIRED FRONT, SIDE, AND REAR YARD SETBACKS:	SEE SETBACKS TABLE
PRIMARY OR SECONDARY WATERSHED PROTECTION OVERLAY DISTRICT:	PRIMARY & SECONDARY
INDICATE IF THE SITE CONTAINS A HISTORIC STRUCTURE:	NO
RECOMMENDATION FROM THE PARKS AND RECREATION ADVISORY BOARD:	FEE IN LIEU w/ REDUCTION OF FEE FOR CONSTRUCTION OF 10' SIDE PATH

CASTLE DEVELOPMENT PARTNERS

SETBACK TABLE:

PARCEL #1:
NONE (RCA)

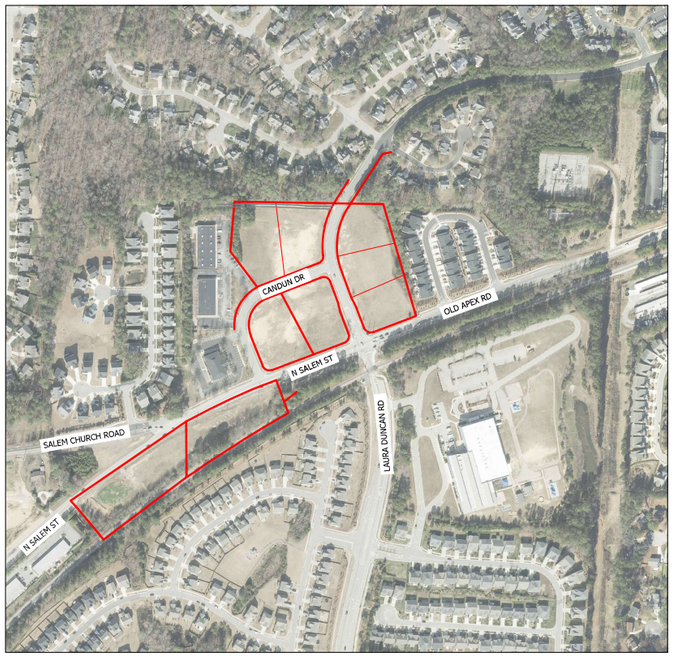
PARCEL #2:
REAR (N) - 5'
SIDE (E) - 20'
SIDE (W) - 0'
FRONT (S) - 10'

PARCEL #3:
REAR (E) - 60'
SIDE (N) - 5'
SIDE (S) - 50'
FRONT (W) - 50' & 20'

PARCEL #4:
REAR (N) - 10'
SIDE (E) - 50'
SIDE (W) - 10'
FRONT (S) - 50'

PARCEL #5:
NONE (RCA)

PARCEL #6:
REAR (S) - 10'
SIDE (E/W) - 10'
FRONT (N) - 10'



VICINITY MAP
1" = 300'

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(919) 828-0531 • thewootencompany.com
License Number : F-0115

DYNAMIK DESIGN

RKA
RAMEY KEMP ASSOCIATES

SHEET INDEX

C-0.01	COVER SHEET
C-1.00	EXISTING CONDITIONS SHEET
C-1.01	LAYOUT SHEET

PROJECT AREA MAP
1" = 200'

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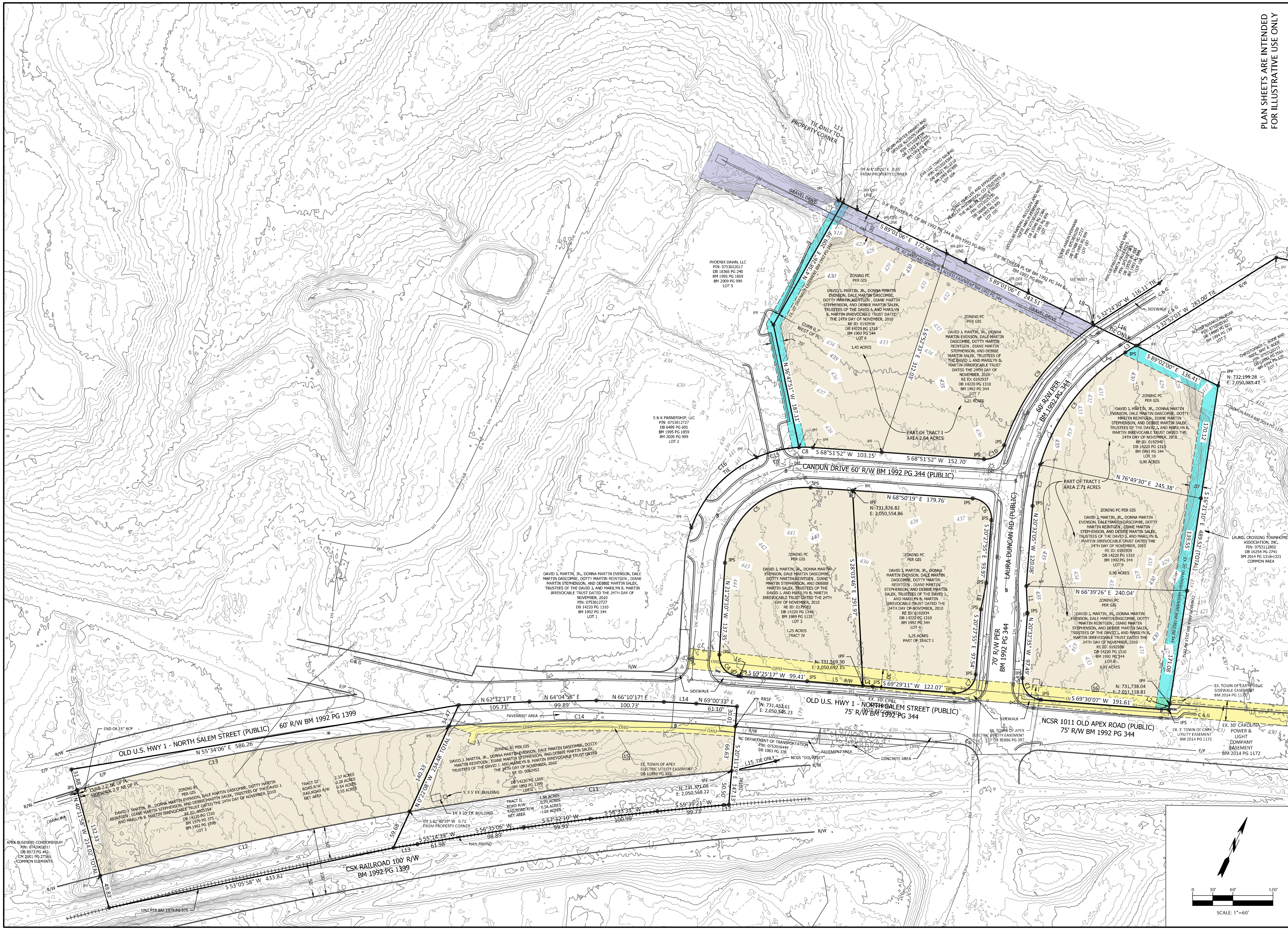

PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY

REVISIONS

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(919) 828-0531 • thewootencompany.com
License Number : F-0115

CASTLE DEVELOPMENT PARTNERS
APEX NORTH CAROLINA
NORTH SALEM STATION
EXISTING CONDITIONS SHEET

DESIGNED BY:	AMW
DRAWN BY:	DAH
CHECKED BY:	AMW
PROJECT NO.:	3376 - B
DATE:	NOV 2021
SCALE:	AS NOTED

0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

C-1.00

GENERAL NOTES

1) REQUESTING FULL TOWN SERVICE. NO PROPOSED PRIVATE SEWAGE.
2) REFER TO PUD DOCUMENT FOR COMPLETE LIST OF ALLOWABLE USES FOR EACH TRACT OR DEVELOPMENT AREA.
3) NO SIGNS ARE APPROVED AS PART OF THE PUD-CZ PLAN APPROVAL. A SEPARATE SIGN PERMIT MUST BE OBTAINED. SIGNAGE WILL COMPLY WITH APEX'S UDO.
4) EXACT ACCESS AND STUB LOCATIONS TO BE FINALIZED AT SUBDIVISION PLAN PHASE.
5) EXACT LOCATION OF RESOURCE CONSERVATION AREA TO BE FINALIZED AT SUBDIVISION PLAN PHASE.
6) ALL PARKING STANDARDS WITHIN THE PUD WILL COMPLY WITH THE TOWN OF APEX'S UDO.
7) PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY.

LEGEND

- RESIDENTIAL DEVELOPMENT BLOCK (TOTAL 5.67 AC)
- STORMWATER MANAGEMENT CONCEPTUAL DEVELOPMENT ENVELOPE
- NON-RESIDENTIAL DEVELOPMENT (0.85 AC)
- RESOURCE CONSERVATION AREA (2.16 AC)***
- PASSIVE OPEN SPACE/PERIMETER BUFFER
- CONCEPTUAL PUBLIC VEHICULAR ACCESS
- CONCEPTUAL PUBLIC GREENWAY PER PRGOS MASTER PLAN

* SETBACK PROVIDED IS GREATER THAN WHAT IS REQUIRED BY TOWN OF APEX'S UDO

**ADJUSTMENTS TO EASEMENT WIDTHS MAY BE REQUIRED DEPENDING ON MODIFICATIONS TO CURRENT UTILITIES

***THE RCA FOR PARCELS 1 AND 5 SHALL BE PLANTED AND DEDICATED PIROR TO THE LAST SITE PLAN FINAL PLAT FOR THE RESIDENTIAL PORTION OF THE DEVELOPMENT.

PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY

45' UTILITY, ACCESS & GREENWAY EASEMENT**

PR. DOG PARK LOCATION FINAL LOCATION TO BE VERIFIED

PROPOSED DEDICATED RCA 3,106 SF/0.07 AC

PROPOSED DEDICATED RCA 23,455 SF/0.54 AC

FUTURE PROPERTY LINE

10' TYPE A BUFFER

5' BLDG SETBACK

10' TYPE A BUFFER + 5' PARKING LOT SETBACK

PROPOSED RESIDENTIAL USE

*20' BLDG SETBACK

CONCEPTUAL STORMWATER LOCATION

10' BLDG SETBACK

60' R/W PER BM 1992 PG 344

CANDUN DRIVE 60' R/W BM 1992 PG 344 (PUBLIC)

60' R/W

*50' BLDG SETBACK

30' TYPE A BUFFER + 5' PARKING LOT SETBACK

70' R/W

70' R/W PER BM 1992 PG 344 LAURA DUNCAN RD (PUBLIC)

15' TYPE A BUFFER + 5' PARKING LOT SETBACK

10' SIDEPATH

CONCEPTUAL STORMWATER LOCATION

PROPOSED DEDICATED RCA 11,844 SF/0.27 AC

FUTURE ROUNDABOUT PER TOWN OF APEX'S THOROUGHFARE AND COLLECTOR STREET PLAN

MAXIMUM OF 10,587 SF/0.24 ACRES TO BE DEDICATED TO TOWN OF APEX AS RIGHT-OF-WAY

Ø180'

PROPOSED DEDICATED RCA 4,664 SF/0.11 AC

OLD U.S. HWY 1 - NORTH SALEM STREET (PUBLIC) 75' R/W BM 1992 PG 344

EX. 30' CP&L EASEMENT (NOT RECORDED)

85' PR. R/W

EX. TOWN OF APEX ELECTRIC UTILITY EASEMENT DB 31886 PG 397

EX. 3' TOWN OF CARY UTILITY EASEMENT BM 2014 PG 1172

EX. 30' CAROLINA POWER & LIGHT COMPANY EASEMENT BM 2014 PG 1172

EX. TOWN OF CARY PUBLIC SIDEWALK EASEMENT BM 2014 PG 1172

TWO (2) PR. BUS STOPS FINAL LOCATION TO BE COORDINATED

NCSR 1011 OLD APEX ROAD (PUBLIC) 75' R/W BM 1992 PG 344

PROPOSED NON-RESIDENTIAL USE

10' BLDG SETBACK

20' TYPE A BUFFER + 5' PARKING LOT SETBACK

FUTURE PROPERTY LINE

PROPOSED DEDICATED RCA 50,875 SF/1.17 AC

EX. TOWN OF APEX ELECTRIC UTILITY EASEMENT DB 11886 PG 323

SCALE: 1"=60'

REVISIONS

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License Number - F-0115

CASTLE DEVELOPMENT PARTNERS
NORTH CAROLINA
NORTH SALEM STATION
APEX

LAYOUT SHEET

DESIGNED BY: AMW
DRAWN BY: DAH
CHECKED BY: AMW
PROJECT NO.: 3376 - B
DATE: NOV 2021
SCALE: AS NOTED

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

C-1.01

CASTLE
DEVELOPMENT PARTNERS

APEX MULTIFAMILY

APEX, NORTH CAROLINA
EXAMPLE IMAGERY

CSP2021-02

DYNAMIK
DESIGN

CASTLE
DEVELOPMENT PARTNERS

APEX NON-RESIDENTIAL

APEX, NORTH CAROLINA

EXAMPLE IMAGERY

CASTLE
DEVELOPMENT PARTNERS

RAMEY KEMP ASSOCIATES

TOGETHER WE ARE LIMITLESS

Laura Duncan Road Development

Traffic Impact Analysis

Apex, North Carolina

rameykemp.com

TRAFFIC IMPACT ANALYSIS

FOR

LAURA DUNCAN ROAD DEVELOPMENT

LOCATED

IN

APEX, NC

Prepared For:
CASTLE DEVELOPMENT PARTNERS
230 Court Square, Suite 202
Charlottesville, VA

Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

November 2021

RKA Project No. 21599

Prepared By: AI

Reviewed By: MK

TRAFFIC IMPACT ANALYSIS
LAURA DUNCAN ROAD DEVELOPMENT
APEX, NORTH CAROLINA

EXECUTIVE SUMMARY

1. Development Overview

A Traffic Impact Analysis (TIA) was conducted for the proposed Laura Duncan Road Development in accordance with the Town of Apex (Town) Unified Development Ordinance (UDO) and North Carolina Department of Transportation (NCDOT) capacity analysis guidelines. The proposed development is to be located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan Road in Apex, North Carolina. The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 240 apartment units and a commercial outparcel south of the intersection of N. Salem Street and Salem Church Road. Based on a review of the commercial outparcel and the setback requirements from N. Salem Street and the CSX Rail Line, the commercial outparcel will realistically only have one (1) acre of developable land. The remaining ~1.5 acres will be dedicated as resource conservation area (RCA) or as right-of-way/land for the future roundabout at the intersection of N. Salem Street and Salem Church Road per the Town's Comprehensive Transportation Plan (CTP). It should be noted that the commercial outparcel land use(s) and intensity are unknown at this time. Therefore, 10,000 square feet of general retail space per acre of developable land [1 acre in total] was assumed for the commercial outparcel.

Access to the residential portion of the site is proposed via two (2) full movement access points along Laura Duncan Road and two (2) full movement access points along Candun Drive. Access to the commercial outparcel is proposed via one (1) full movement access point along N. Salem Street

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios to provide analysis with and without the commercial outparcel upon build-out of the proposed development:

- 2021 Existing Traffic Conditions

- 2024 No-Build Traffic Conditions
- 2024 Build Traffic Conditions – Scenario 1 [Residential]
- 2024 Build Traffic Conditions – Scenario 2 [Residential + Commercial]

2. Existing Traffic Conditions

The study area for the TIA was determined through coordination with the North Carolina Department of Transportation (NCDOT), the Town of Apex (Town), and the Town of Cary and consists of the following existing intersections:

- N. Salem Street / Old Apex Road and Laura Duncan Road
- Laura Duncan Road and Candun Drive
- N. Salem Street and Candun Drive
- N. Salem Street and Salem Church Road
- Old Apex Road and Cary Parkway

Existing peak hour traffic volumes were determined based on traffic counts conducted at all of the study intersections listed above in September of 2021 by RKA during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods expect the intersection of Old Apex Road and Cary Parkway. Traffic counts at the intersection of Old Apex Road and Cary Parkway from the Town of Cary (21-TAR-460), previously collected in August of 2021, were utilized for analysis purposes. All COVID factor adjustment methodology from 21-TAR-460 was utilized for the existing peak hour traffic volumes at this intersection. Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. This methodology was reviewed and approved by NCDOT and Town staff. Refer to Section 2.1 of this report for a more detailed explanation of the existing peak hour traffic volume development methodology.

3. Site 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*, 10th Edition. Tables E-1 and E-2 provide a summary of the trip generation potential for Scenario 1 and Scenario 2, respectively. It should be noted that Scenario 1 consists of 240 apartment units and Scenario 2 consists of 240 apartment units and the commercial outparcel.

Table E-1: Site Trip Generation - Scenario 1 [Residential]

LAND USE (ITE Code)	INTENSITY	DAILY TRIPS (VPD)	WEEKDAY AM PEAK HOUR (VPH)		WEEKDAY PM PEAK HOUR (VPH)	
			Enter	Exit	Enter	Exit
Multifamily Housing (Low-Rise) (220)	240 units	1,774	25	85	81	48

Table E-2: Site Trip Generation – Scenario 2 [Residential + Commercial]

LAND USE (ITE Code)	INTENSITY	DAILY TRIPS (VPD)	WEEKDAY AM PEAK HOUR (VPH)		WEEKDAY PM PEAK HOUR (VPH)	
			Enter	Exit	ENTER	EXIT
Multifamily Housing (Low-Rise) (220)	240 units	1,774	25	85	81	48
Retail (820)	10,000* SF	1,256	6^	3^	48	51
Total Trips		**3,030**	**31**	**88**	**129**	**99**
Pass-By Trips: Retail (LUC 820) [0% AM, 34% PM]			*-0*	*-0*	*-17*	*-17*
Total External Trips			**31**	**88**	**112**	**82**

*Since the commercial outparcel land use is unknown at this time, 10,000 SF of general retail space per acre of developable land [1 acre in total] was assumed for this land use.
^Rates were used instead of equations for generating AM peak hour trips

4. Future Traffic Conditions

Based on coordination with the NCDOT and the Town, it was determined there were no adjacent developments to consider with this study and it was determined there were no future roadway improvements to consider with this study.

5. Capacity Analysis Summary

The analysis considered weekday AM and PM peak hour traffic for 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] traffic conditions. Refer to Section 7 of the TIA for the capacity analysis summary performed at each study intersection.

6. Recommendations

Based on the findings of this study, specific geometric and traffic control improvements have been identified at study intersections. The improvements are summarized below and are illustrated in Figure E-1.

Recommended Improvements by Developer – Scenario 1 [Residential]

Laura Duncan Road and Candun Drive/Access A

- Construct the westbound approach with one ingress and one egress lane.
- Provide stop control for the westbound approach.

Laura Duncan Road and Access B

- Construct the eastbound approach with one ingress and one egress lane.
- Provide stop control for the eastbound approach.

Candun Drive and Access C

- Construct the northbound and southbound approaches with one ingress and one egress lane.
- Provide stop control for the northbound and southbound approaches.

Candun Drive and Access D

- Construct the westbound approach with one ingress and one egress lane.
- Provide stop control for the westbound approach.

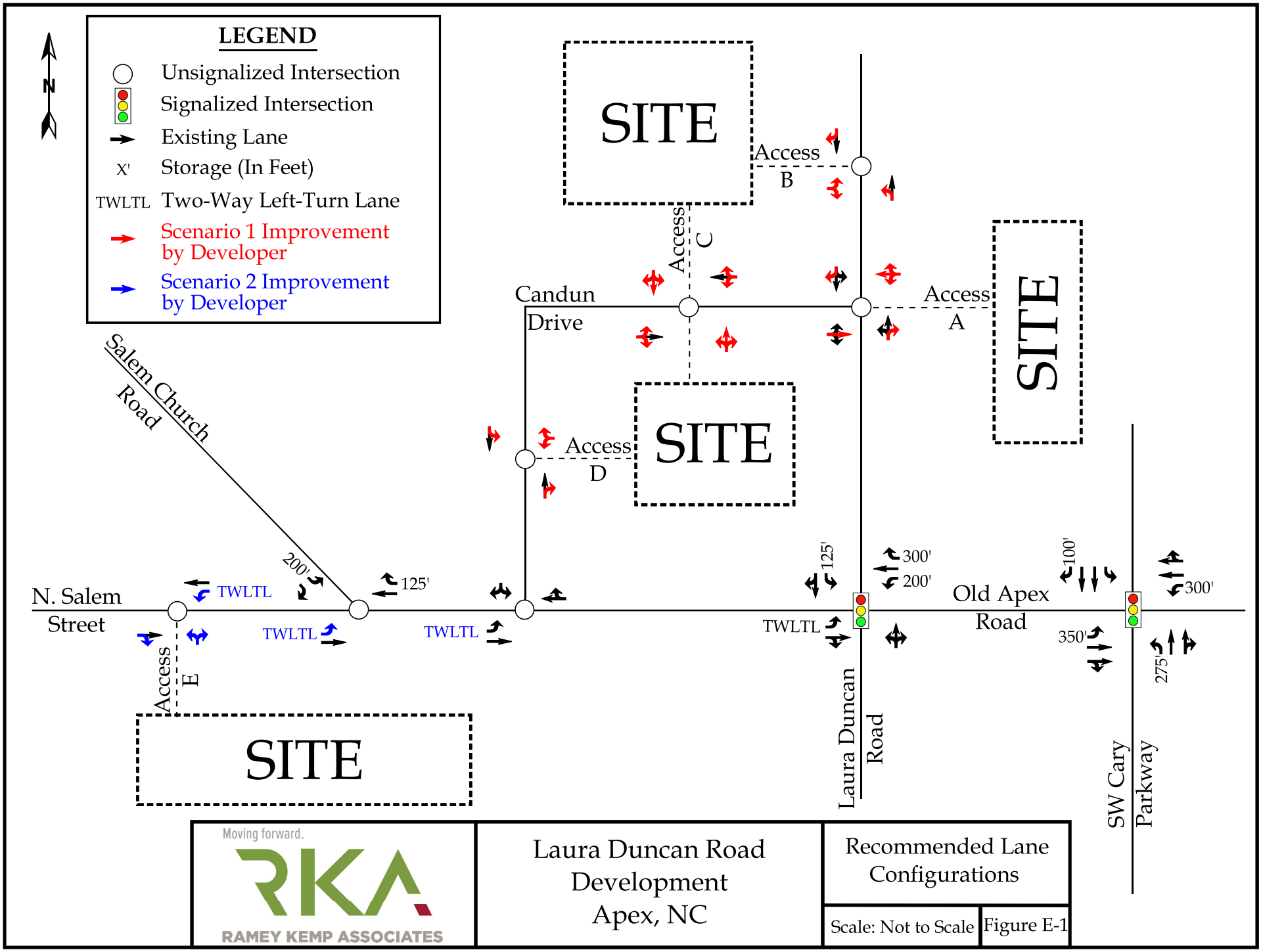
Recommended Improvements by Developer – Scenario 2 [Residential + Commercial]

N. Salem Street

- Widen N. Salem Street to a three-lane cross-section providing a continuation of the existing two-way left-turn lane on either side of its intersection with Salem Church Road.

N. Salem Street and Access E

- Provide an exclusive westbound left-turn lane on N. Salem Street [two-way left-turn lane].
- Construct the northbound approach with one ingress and one egress lane.
- Provide stop control for the northbound approach.


LEGEND
Unsignalized Intersection
Signalized Intersection
Existing Lane
X' Storage (In Feet)
TWLTL Two-Way Left-Turn Lane
Scenario 1 Improvement by Developer
Scenario 2 Improvement by Developer
N
SITE
SITE
SITE
SITE
Access B
Access C
Access A
Access D
Access E
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
TWLTL
TWLTL
TWLTL
TWLTL
200'
125'
125'
300'
200'
100'
300'
350'
275'
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development Apex, NC
Recommended Lane Configurations
Scale: Not to Scale
Figure E-1

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TRAFFIC IMPACT ANALYSIS
LAURA DUNCAN ROAD DEVELOPMENT
APEX, NORTH CAROLINA

1. INTRODUCTION

The contents of this report present the findings of the Traffic Impact Analysis (TIA) conducted for the proposed Laura Duncan Road Development to be located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan 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.

The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 240 apartment units and a commercial outparcel south of the intersection of N. Salem Street and Salem Church Road. Based on a review of the commercial outparcel and the setback requirements from N. Salem Street and the CSX Rail Line, the commercial outparcel will realistically only have one (1) acre of developable land. The remaining ~1.5 acres will be dedicated as resource conservation area (RCA) or as right-of-way/land for the future roundabout at the intersection of N. Salem Street and Salem Church Road per the Town's Comprehensive Transportation Plan (CTP). It should be noted that the commercial outparcel land use(s) and intensity are unknown at this time. Therefore, 10,000 square feet of general retail space per acre of developable land [1 acre in total] was assumed for the commercial outparcel.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios to provide analysis with and without the commercial outparcel upon build-out of the proposed development:

- 2021 Existing Traffic Conditions
- 2024 No-Build Traffic Conditions
- 2024 Build Traffic Conditions – Scenario 1 [Residential]
- 2024 Build Traffic Conditions – Scenario 2 [Residential + Commercial]

1.1. Site Location and Study Area

The proposed development is located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan 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), the Town of Apex (Town), and the Town of Cary and consists of the following existing intersections:

- N. Salem Street / Old Apex Road and Laura Duncan Road
- Laura Duncan Road and Candun Drive
- N. Salem Street and Candun Drive
- N. Salem Street and Salem Church Road
- Old Apex Road and Cary Parkway

Refer to Appendix A for the approved memorandum of understanding.

1.2. Proposed Land Use and Site Access

The site is located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan Road. The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 240 apartment units and a commercial outparcel south of the intersection of N. Salem Street and Salem Church Road. It should be noted that the commercial outparcel land use(s) and intensity are unknown at this time. Therefore, 10,000 square feet of general retail space per acre of developable land [1 acre in total] was assumed for the commercial outparcel.

Access to the residential portion of the site is proposed via two (2) full movement access points along Laura Duncan Road and two (2) full movement access points along Candun Drive. Access to the commercial outparcel is proposed via one (1) full movement access point along N. Salem Street. Refer to Figure 2 for a copy of the preliminary site plan.

1.3. Adjacent Land Uses

The proposed development is located in an area consisting primarily of undeveloped land and residential development. The Laurel Park Elementary School is located east of Laura Duncan Road and south of Old Apex Road. The CSX Railroad runs parallel to N. Salem Street/Old Apex Road and crosses Laura Duncan Road just south of its intersection with N. Salem Street/Old Apex Road within the study area.

1.4. Existing Roadways

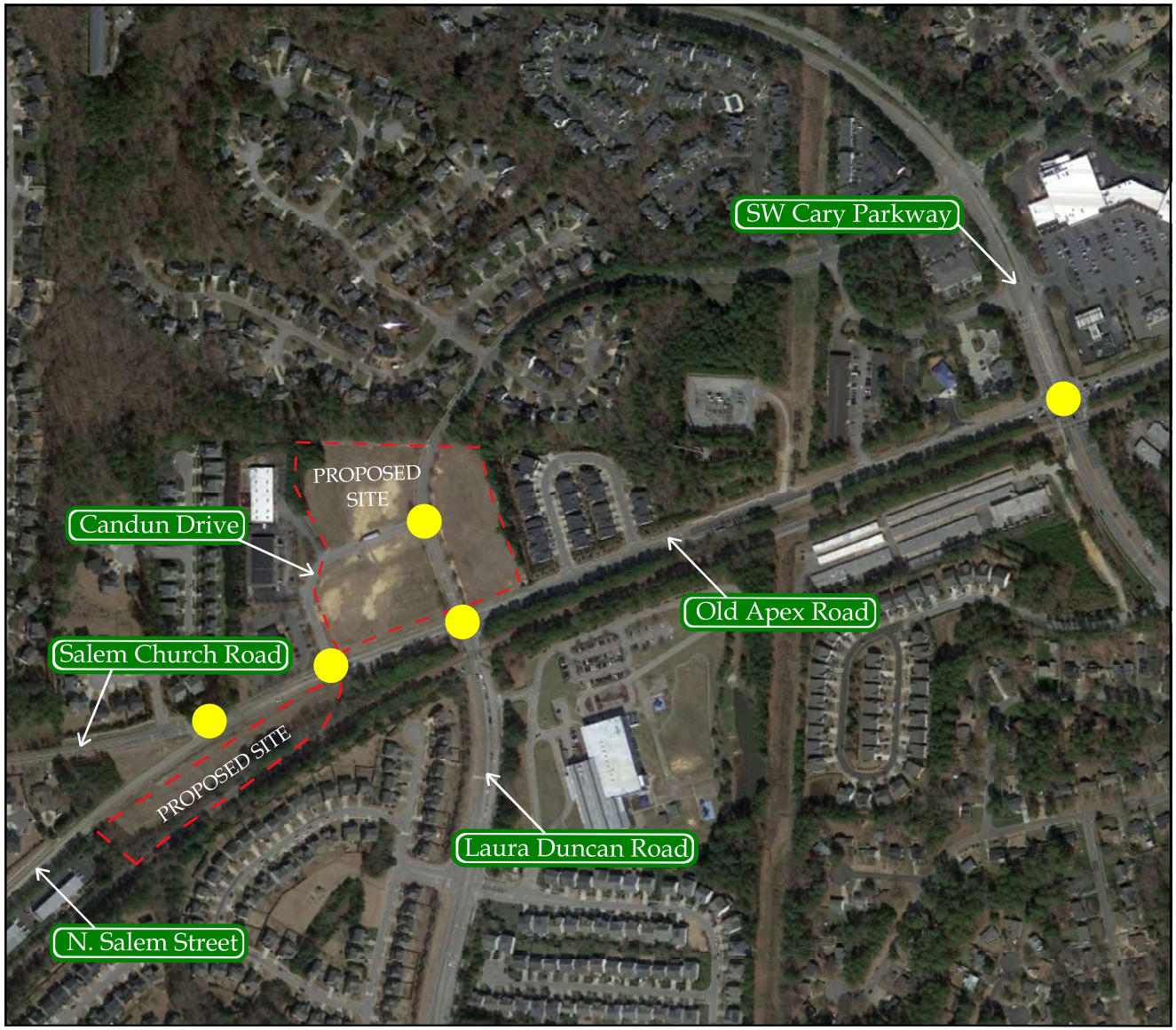
Existing lane configurations (number of traffic lanes on each intersection approach), lane widths, storage capacities, and other intersection and roadway information within the study area are shown in Figure 3. Table 1 provides a summary of this information, as well.

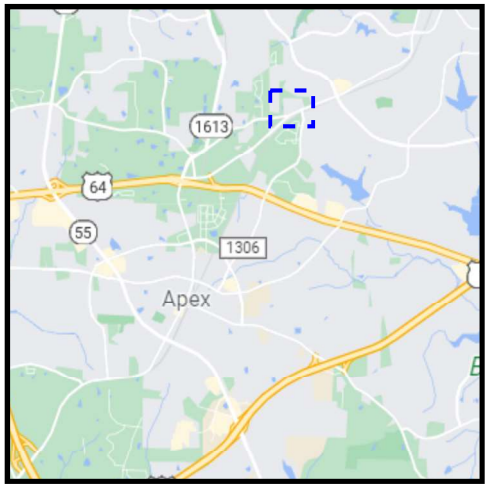
Table 1: Existing Roadway Inventory

ROAD NAME	ROUTE NUMBER	TYPICAL CROSS SECTION	SPEED LIMIT	MAINTAINED BY	2019 AADT (VPD)
N. Salem Street	SR 1011	2-lane undivided	45 mph	NCDOT	10,000
Old Apex Road	SR 1011	3-lane undivided	45 mph	NCDOT	15,000
Laura Duncan Road	SR 1308	2-lane undivided	45 mph	NCDOT	11,000[1] / 1,920*[2]
Candun Drive	N/A	2-lane undivided	25 mph	Local	360*
Salem Church Road	SR 1614	2-lane undivided	35 mph	NCDOT	3,000
Cary Parkway	SR 3977	4-lane Divided	45 mph	NCDOT	25,000

1. Laura Duncan Road AADT south of N. Salem Street
2. Laura Duncan Road AADT north of N. Salem Street

*ADT based on the traffic counts from 2021 and assuming the weekday PM peak hour volume is 10% of the average daily traffic.





LEGEND

- Proposed Site Location
- Study Intersection
- Study Area

Moving forward.
RKA
RAMEY KEMP ASSOCIATES

Laura Duncan Road Development
Apex, NC

Site Location Map

Scale: Not to Scale | Figure 1

N

GENERAL NOTES

1) REQUESTING FULL TOWN SERVICE. NO PROPOSED PRIVATE SEWAGE.
2) REFER TO PUD DOCUMENT FOR COMPLETE LIST OF ALLOWABLE USES FOR EACH TRACT OR DEVELOPMENT AREA.
3) NO SIGNS ARE APPROVED AS PART OF THE PUD-CZ PLAN APPROVAL. A SEPARATE SIGN PERMIT MUST BE OBTAINED. SIGNAGE WILL COMPLY WITH APEX'S UDO.
4) EXACT ACCESS AND STUB LOCATIONS TO BE FINALIZED AT SUBDIVISION PLAN PHASE.
5) EXACT LOCATION OF RESOURCE CONSERVATION AREA TO BE FINALIZED AT SUBDIVISION PLAN PHASE.
6) ALL PARKING STANDARDS WITHIN THE PUD WILL COMPLY WITH THE TOWN OF APEX'S UDO.
7) PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY.

LEGEND

- RESIDENTIAL DEVELOPMENT BLOCK (TOTAL 4.92 AC)
- PASSIVE OPEN SPACE/ PERIMETER BUFFERS (TOTAL 0.50 AC)
- STORMWATER MANAGEMENT CONCEPTUAL DEVELOPMENT ENVELOPE
- NON-RESIDENTIAL DEVELOPMENT (0.85 AC)
- RESOURCE CONSERVATION AREA (2.04 AC)
- CONCEPTUAL PUBLIC VEHICULAR ACCESS
- CONCEPTUAL 10' SIDEPATH

PLAN SHEETS ARE INTENDED FOR ILLUSTRATIVE USE ONLY

PR. DOG PARK LOCATION FINAL LOCATION TO BE VERIFIED

PROPOSED DEDICATED RCA 3,166 SF/0.07 AC

PROPOSED DEDICATED RCA 24,482 SF/0.56 AC

FUTURE PROPERTY LINE

10' TYPE A BUFFER + 5' PARKING LOT SETBACK

5' BLDG SETBACK

10' TYPE A BUFFER + 5' PARKING LOT SETBACK

PROPOSED RESIDENTIAL USE

20' BLDG SETBACK *VOLUNTARY*

CONCEPTUAL STORMWATER LOCATION

10' BLDG SETBACK

5' BLDG SETBACK

20' BLDG SETBACK *VOLUNTARY*

CANDUN DRIVE 60' R/W BM 1992 PG 344 (PUBLIC)

LAURA DUNCAN RD (PUBLIC)

60' R/W PER BM 1992 PG 344

60' BLDG SETBACK VOLUNTARY

10' BLDG SETBACK

50' BLDG SETBACK *VOLUNTARY*

PROPOSED RESIDENTIAL USE

30' TYPE A BUFFER + 5' PARKING LOT SETBACK

CONCEPTUAL STORMWATER LOCATION

70' PR. R/W

60' R/W

15' TYPE A BUFFER + 5' PARKING LOT SETBACK

50' BLDG SETBACK *VOLUNTARY*

70' R/W PER BM 1992 PG 344

PROPOSED DEDICATED RCA 10,155 SF/0.23 AC

FUTURE ROUNDABOUT PER TOWN OF APEX'S THOROUGHFARE AND COLLECTOR STREET PLAN

10,587 SF/0.24 ACRES TO BE DEDICATED TO TOWN OF APEX AS RIGHT-OF-WAY

Ø180'

20' TYPE B BUFFER + 5' PARKING LOT SETBACK

OLD U.S. HWY 1 - NORTH SALEM STREET (PUBLIC) 75' R/W BM 1992 PG 344

10' BLDG SETBACK

PROPOSED DEDICATED RCA 50,955 SF/1.17 AC

EX. TOWN OF APEX ELECTRIC UTILITY EASEMENT DB 11886 PG 393

PR. BUS STOP FINAL LOCATION TO BE VERIFIED

85' PR. R/W

EX. TOWN OF APEX ELECTRIC UTILITY EASEMENT DB 11886 PG 393

30' TYPE B BUFFER + 5' PARKING LOT SETBACK

EX. 3' TOWN OF CARY UTILITY EASEMENT BM 2014 PG 1172

EX. 30' CAROLINA POWER & LIGHT COMPANY EASEMENT BM 2014 PG 1172

NCSR 1011 OLD APEX ROAD (PUBLIC) 75' R/W BM 1992 PG 344

10' BLDG SETBACK

PROPOSED NON-RESIDENTIAL USE

20' TYPE A BUFFER + 5' PARKING LOT SETBACK

10' BLDG SETBACK

IPF S 82°40'39" W 0.71' FROM PROPERTY CORNER

NAIL FOUND

SCALE: 1"=60'

REVISIONS

Wooten

120 North Boylan Avenue • Raleigh, NC 27603-1423
(919) 828-0531 • thewootencompany.com
License Number - F-0115

CASTLE DEVELOPMENT PARTNERS NORTH CAROLINA

NORTH SALEM STATION

APEX

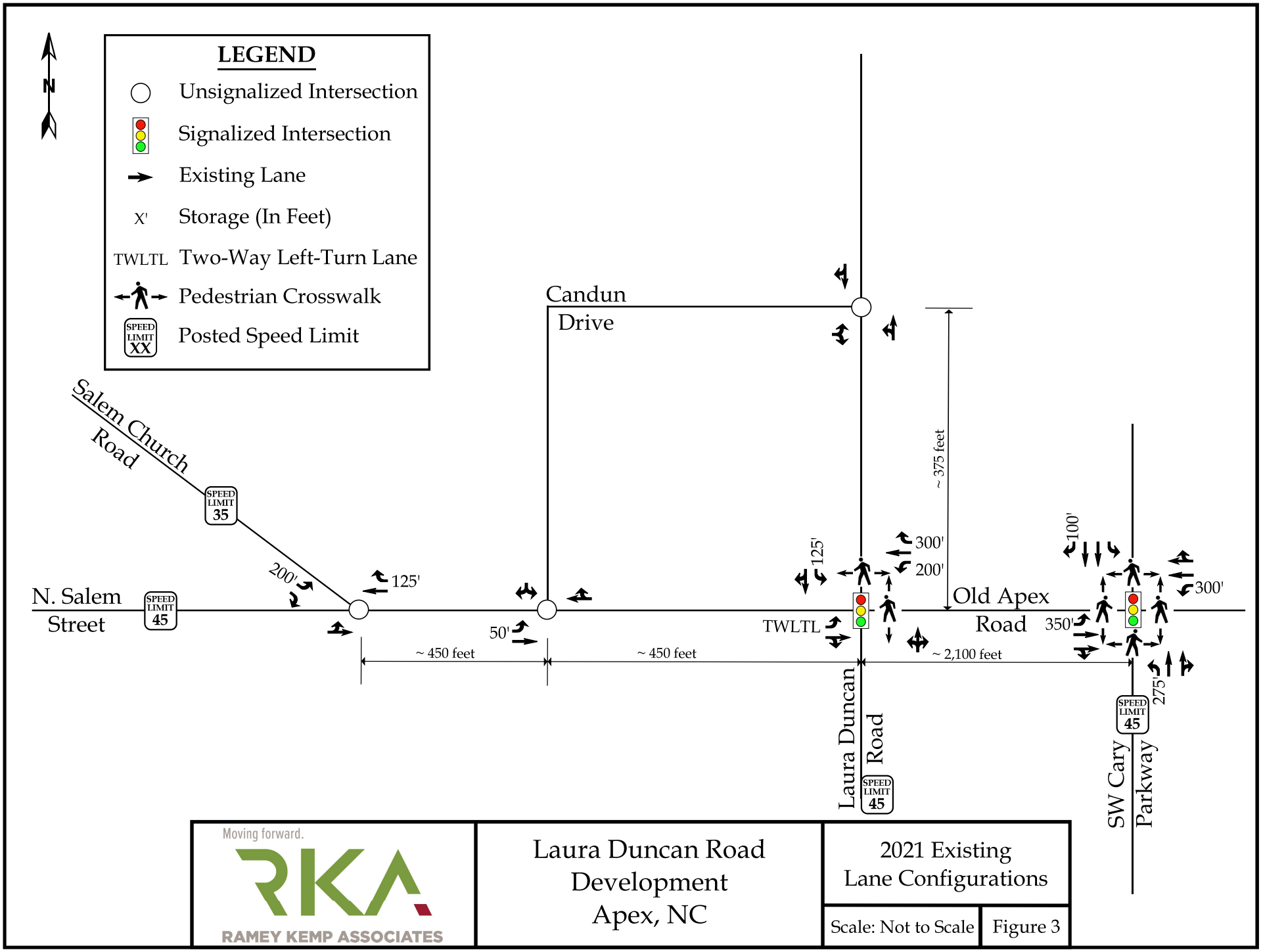
LAYOUT SHEET

DESIGNED BY: AMW
DRAWN BY: DAH
CHECKED BY: AMW
PROJECT NO.: 3376 - B
DATE: NOV 2021
SCALE: AS NOTED

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

C-1.01

T:\Projects\Castle_Development_Partners-3376\B-North_Salem_Station_CADD\DrawingSets\Rezoning Exhibits\3376-B-SHTS.dwg AWADSWORTH 11/23/2021 1:31 PM



Moving forward. RKA RAMEY KEMP ASSOCIATES

Laura Duncan Road Development Apex, NC	2021 Existing Lane Configurations	
	Scale: Not to Scale	Figure 3

2. 2021 EXISTING PEAK HOUR CONDITIONS

2.1. 2021 Existing Peak Hour Traffic Volumes

Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in September of 2021 by Burns Service, Inc. during typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods:

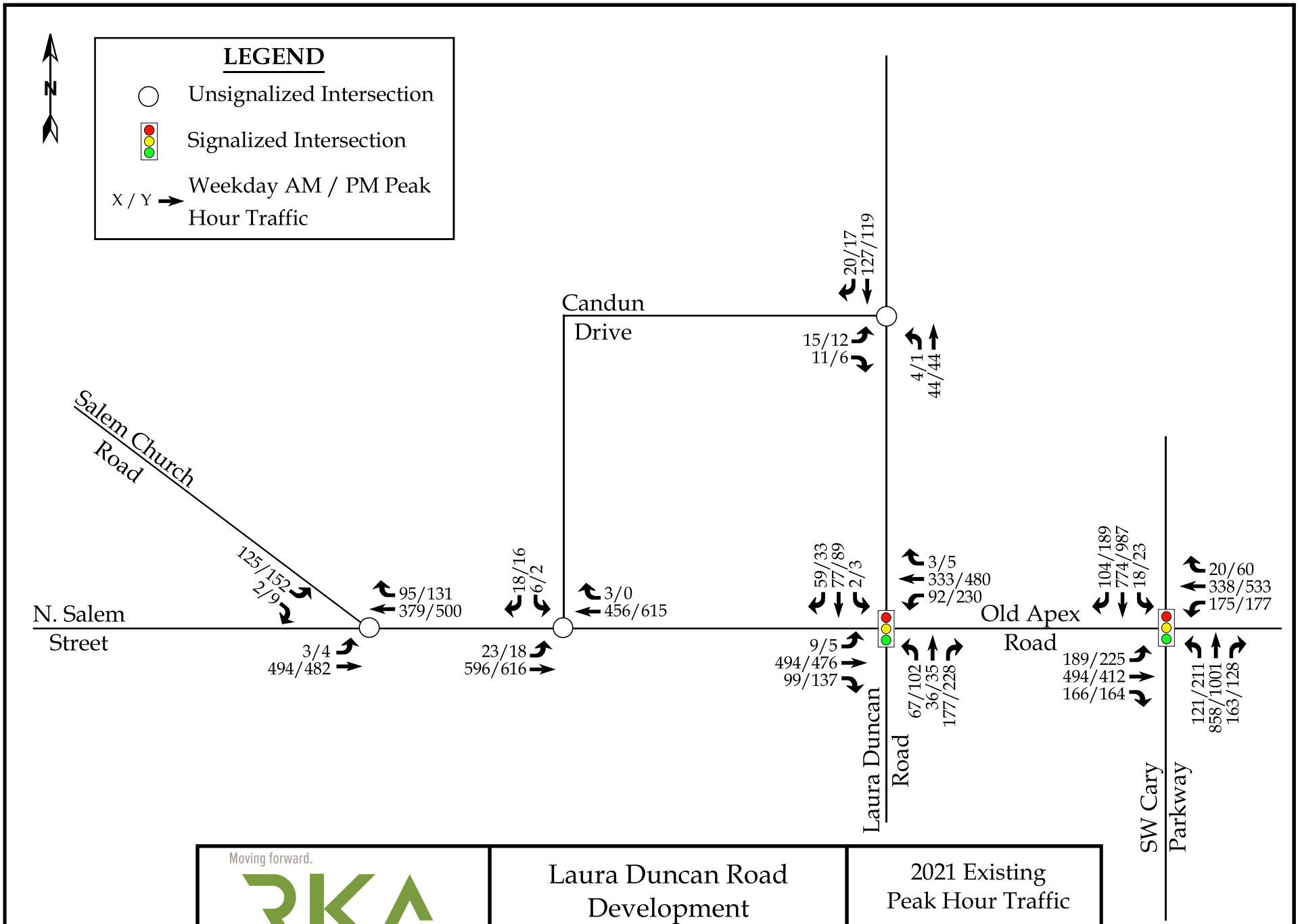
- N. Salem Street / Old Apex Road and Laura Duncan Road
- Laura Duncan Road and Candun Drive
- N. Salem Street and Candun Drive
- N. Salem Street and Salem Church Road

Traffic counts at the intersection of Old Apex Road and Cary Parkway from the Town of Cary (21-TAR-460) were utilized for analysis purposes. All COVID factor adjustment methodology from 21-TAR-460 was utilized for the existing peak hour traffic volumes at this intersection. Traffic counts were collected in August of 2021 while schools were not in session and during the effects of the COVID-19 pandemic. Traffic counts from May of 2019 at this intersection were available from the Town of Cary which were collected when schools were in session. Based on a comparison of grown 2021 counts (May 2019 counts grown to 2021 using a 1% growth rate) and the August 2021 counts, adjustment factors of 1.25 and 1.33 were calculated and applied [to the August 2021 traffic counts] to determine the new weekday AM and PM peak hour traffic volumes, respectively. This methodology was reviewed and approved by NCDOT and Town staff.

Weekday AM and PM traffic volumes were balanced between study intersections, where appropriate. Additionally, it was confirmed that schools within the vicinity of the proposed development were in session and operating under typical operations at the time traffic counts were conducted with one exception at the intersection of Old Apex Road and Cary Parkway noted above. Refer to Figure 4 for 2021 existing 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 2021 Existing Peak Hour Traffic Conditions

The 2021 existing 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 the Town of Cary and is included in Appendix C. The results of the analysis are presented in Section 7 of this report.



Moving forward. RKA RAMEY KEMP ASSOCIATES

Laura Duncan Road Development Apex, NC

2021 Existing Peak Hour Traffic

Scale: Not to Scale | Figure 4

3. 2024 NO-BUILD PEAK HOUR CONDITIONS

In order to account for growth of traffic and subsequent traffic conditions at a future year, no-build traffic projections are needed. No-build 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. No-build 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 annual growth rate of 3% would be used to generate 2024 projected weekday AM and PM peak hour traffic volumes.

3.2. Adjacent Development Traffic

Based on coordination with the NCDOT and the Town, it was determined there were no adjacent developments to consider with this study.

3.3. Future Roadway Improvements

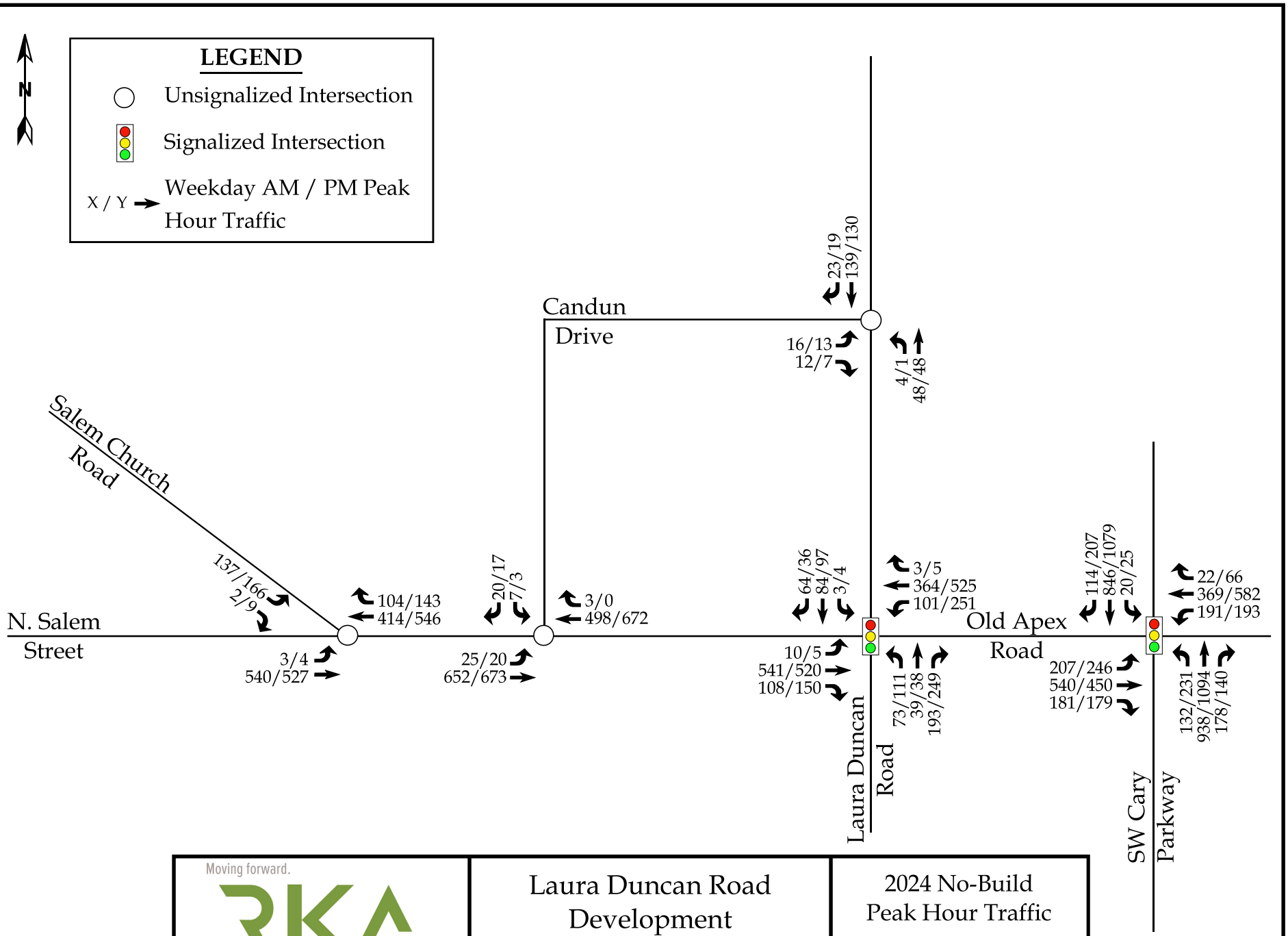
Based on coordination with the NCDOT and the Town, it was determined there were no future roadway improvements to consider with this study.

3.4. 2024 No-Build Peak Hour Traffic Volumes

The 2024 no-build traffic volumes were determined by projecting the 2021 existing peak hour traffic to the year 2024. Refer to Figure 5 for an illustration of the 2024 no-build peak hour traffic volumes at the study intersections.

3.5. Analysis of 2024 No-Build Peak Hour Traffic Conditions

The 2024 no-build AM and PM peak hour traffic volumes at the study intersections were analyzed with existing geometric roadway conditions and traffic control. The analysis results are presented in Section 7 of this report.



Moving forward.
RKA
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Laura Duncan Road Development
Apex, NC

2024 No-Build Peak Hour Traffic

Scale: Not to Scale | Figure 5

4. SITE TRIP GENERATION AND DISTRIBUTION

4.1. Trip Generation

The proposed development is assumed to consist of 240 apartment units and a commercial outparcel. It should be noted that the commercial outparcel land use(s) and intensity are unknown at this time. Therefore, 10,000 square feet of general retail space per acre of developable land [1 acre in total] was assumed for the commercial outparcel. Due to the uncertainty of the commercial outparcel, analysis was provided for two (2) scenarios with and without the commercial outparcel upon build-out of the proposed development: Scenario 1 (Residential) and Scenario 2 (Residential + Commercial).

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. Tables 2 and 3 provide a summary of the trip generation potential for Scenario 1 and Scenario 2, respectively. It should be noted that Scenario 1 consists of 240 apartment units and Scenario 2 consists of 240 apartment units and the commercial outparcel.

Table 2: Trip Generation Summary – Scenario 1 [Residential]

LAND USE (ITE CODE)	INTENSITY	DAILY TRAFFIC (VPD)	AM PEAK HOUR TRIPS (VPH)		PM PEAK HOUR TRIPS (VPH)	
			ENTER	EXIT	ENTER	EXIT
Multifamily Housing (Low-Rise) (220)	240 units	1,774	25	85	81	48

For Scenario 1 [Residential], it is estimated that the proposed development will generate approximately 1,774 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 110 trips (25 entering and 85 exiting) will occur during the weekday AM peak hour and 129 trips (81 entering and 48 exiting) will occur during the weekday PM peak hour.

Table 3: Trip Generation Summary – Scenario 2 [Residential + Commercial]

LAND USE (ITE CODE)	INTENSITY	DAILY TRAFFIC (VPD)	AM PEAK HOUR TRIPS (VPH)		PM PEAK HOUR TRIPS (VPH)	
			ENTER	EXIT	ENTER	EXIT
Multifamily Housing (Low-Rise) (220)	240 units	1,774	25	85	81	48
Retail (820)	10,000* SF	1,256	6^	3^	48	51
Total Trips		**3,030**	**31**	**88**	**129**	**99**
Pass-By Trips: Retail (LUC 820) [0% AM, 34% PM]			*-0*	*-0*	*-17*	*-17*
Total External Trips			**31**	**88**	**112**	**82**

*Since the commercial outparcel land use is unknown at this time, 10,000 SF of general retail space per acre of developable land [1 acre in total] was assumed for this land use.
^Rates were used instead of equations for generating AM peak hour trips

For Scenario 2 [Residential + Commercial], it is estimated that the proposed development will generate approximately 3,030 total site trips on the roadway network during a typical 24-hour weekday period. It is anticipated that 119 trips (31 entering and 88 exiting) will occur during the weekday AM peak hour and 228 trips (129 entering and 99 exiting) will occur during the weekday PM peak hour.

Internal capture of trips between the residential and commercial uses was not considered in this study. Internal capture is the consideration for trips that will be made within the site between different land uses, so the vehicle technically never leaves the internal site but can still be considered as a trip to that specific land use. However, since the commercial outparcel is not connected to the residential portion of the development, no internal capture was applied to provide for a conservative analysis.

Pass-by trips were also taken into consideration in this study. Pass-by trips are made by the traffic already using the adjacent roadway, entering the site as an intermediate stop on their way to another destination. Pass-by percentages are applied to site trips after adjustments for internal capture. Pass-by trips are expected to account for approximately 34 trips (17 entering

and 17 exiting) during the weekday PM peak hour. It should be noted that the pass-by trips were balanced, as it is likely that these trips would enter and exit in the same hour.

The total primary site trips are the calculated site trips after the reduction for pass-by trips. Primary site trips are expected to generate approximately 119 trips (31 entering and 88 exiting) during the weekday AM peak hour and 194 trips (112 entering and 94 exiting) during the weekday PM peak hour.

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.

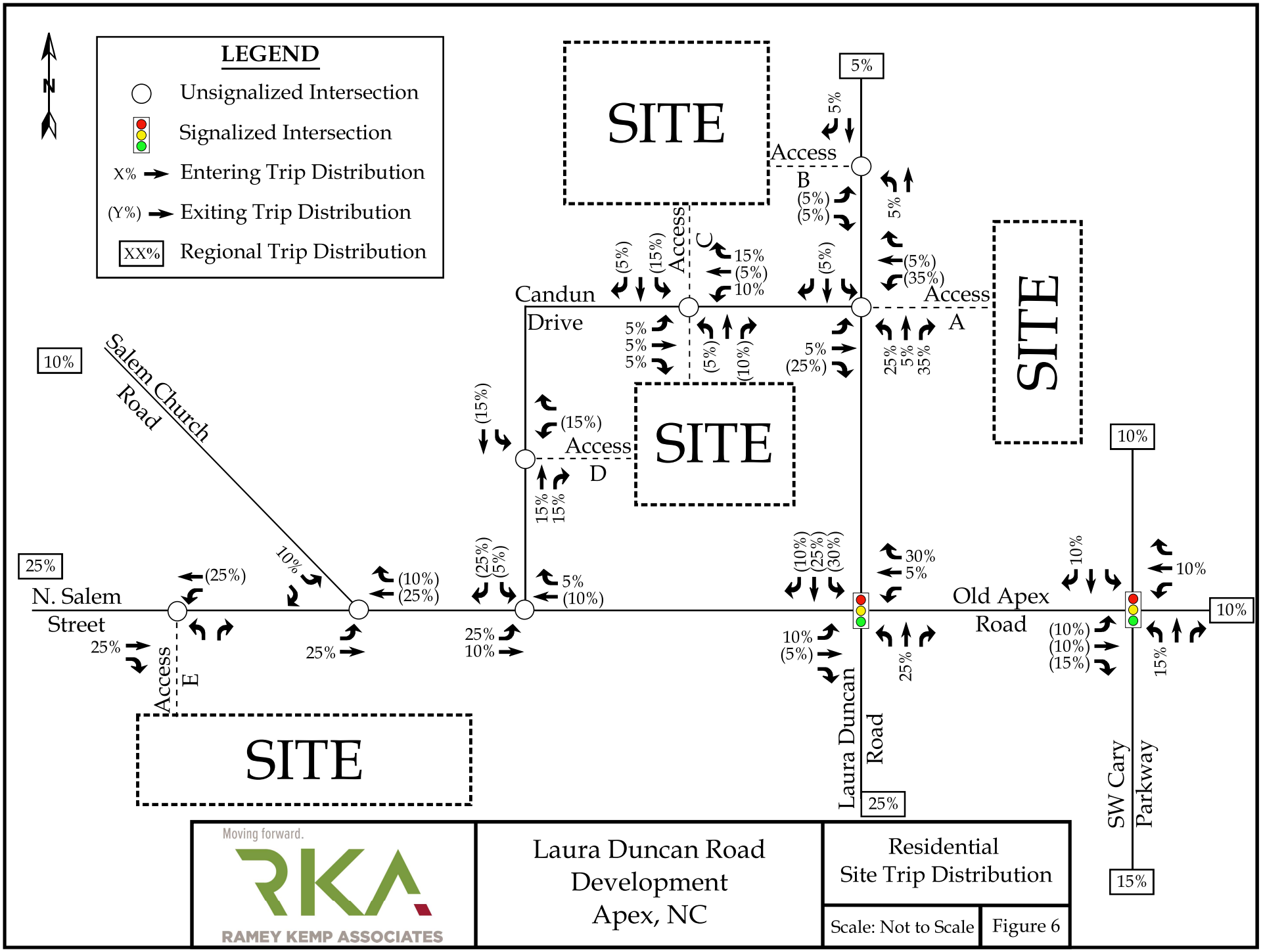
It is estimated that the site trips will be regionally distributed as follows:

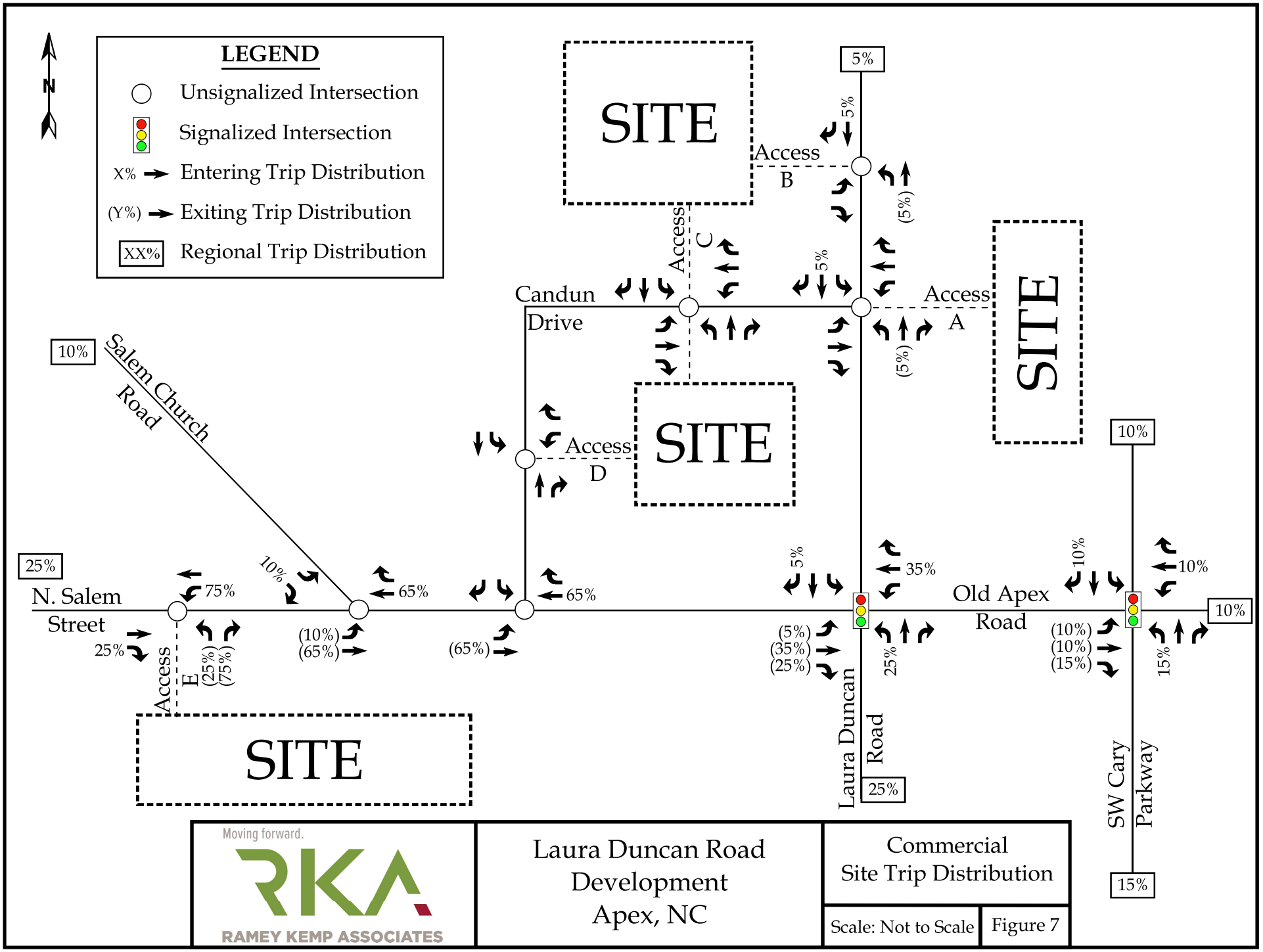
- 25% to/from the south via Laura Duncan Road
- 5% to/from the north via Laura Duncan Road
- 25% to/from the west via N. Salem Street
- 10% to/from the east via Old Apex Road
- 10% to/from the west via Salem Church Road
- 10% to/from the north via Cary Parkway
- 15% to/from the south via Cary Parkway

The residential site trip distribution is shown in Figure 6 and the commercial site trip distribution is shown in Figure 7. Refer to Figure 8 for the residential site trip assignment and Figure 9 for the commercial site trip assignment.

The pass-by site trips were distributed based on existing traffic patterns with consideration given to the proposed driveway access and site layout. Refer to Figure 10 for the pass-by site trip distribution. Pass-by site trips are shown in Figure 11.

The total site trips for Scenario 2 [Residential + Commercial] were determined by adding the residential site trips (Figure 8), commercial site trips (Figure 9), and the pass-by site trips (Figure 11). Refer to Figure 12 for the total peak hour site trips at the study intersections.


LEGEND
Unsignalized Intersection
Signalized Intersection
X% Entering Trip Distribution
(Y%) Exiting Trip Distribution
XX% Regional Trip Distribution
N
SITE
SITE
SITE
SITE
Access B
Access C
Access D
Access E
Access A
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
5%
10%
25%
15%
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development
Apex, NC
Residential Site Trip Distribution
Scale: Not to Scale
Figure 6

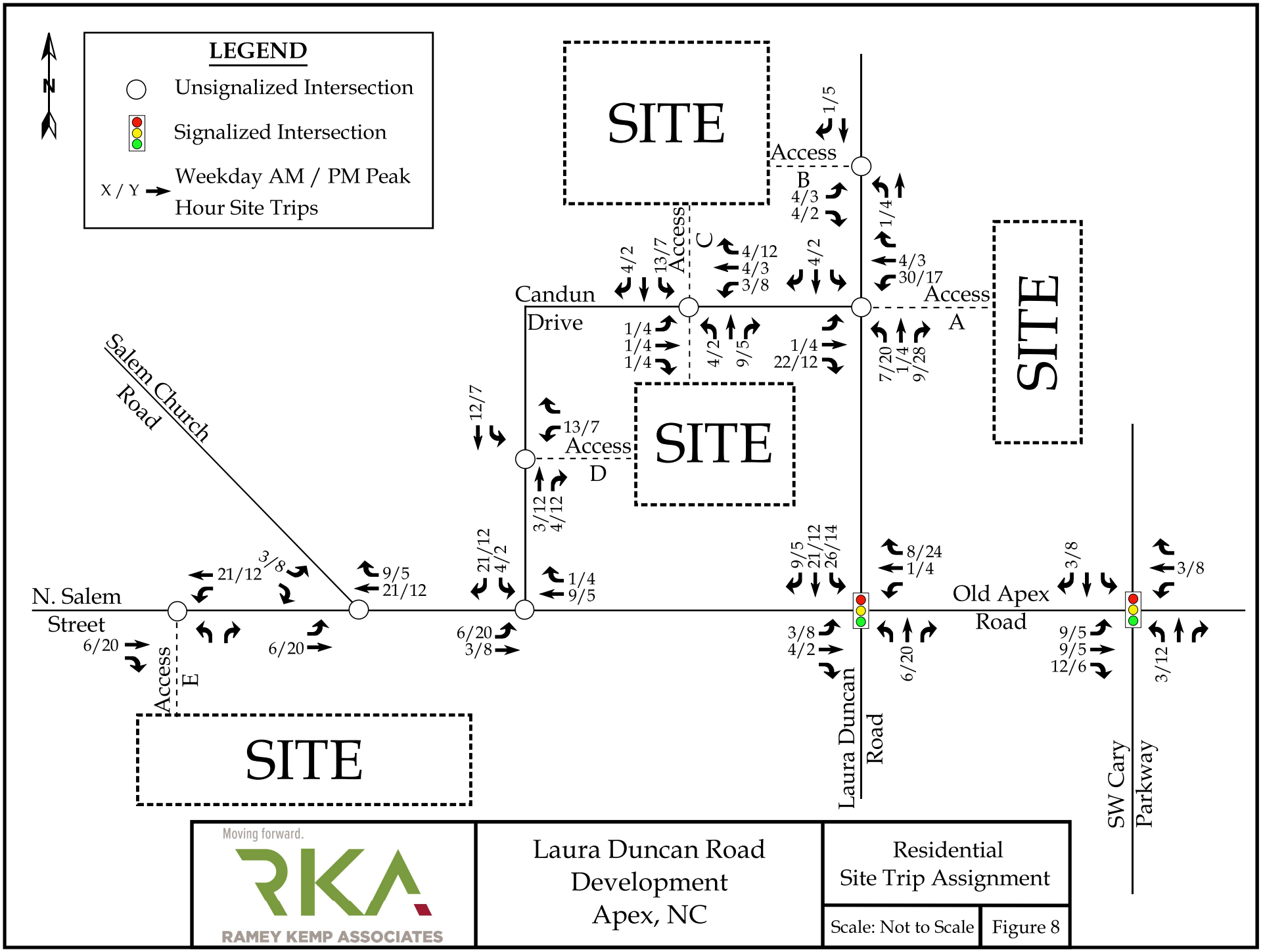


Moving forward.
RKA
RAMEY KEMP ASSOCIATES

Laura Duncan Road
Development
Apex, NC

Commercial
Site Trip Distribution

Scale: Not to Scale | Figure 7



Moving forward.
RKA
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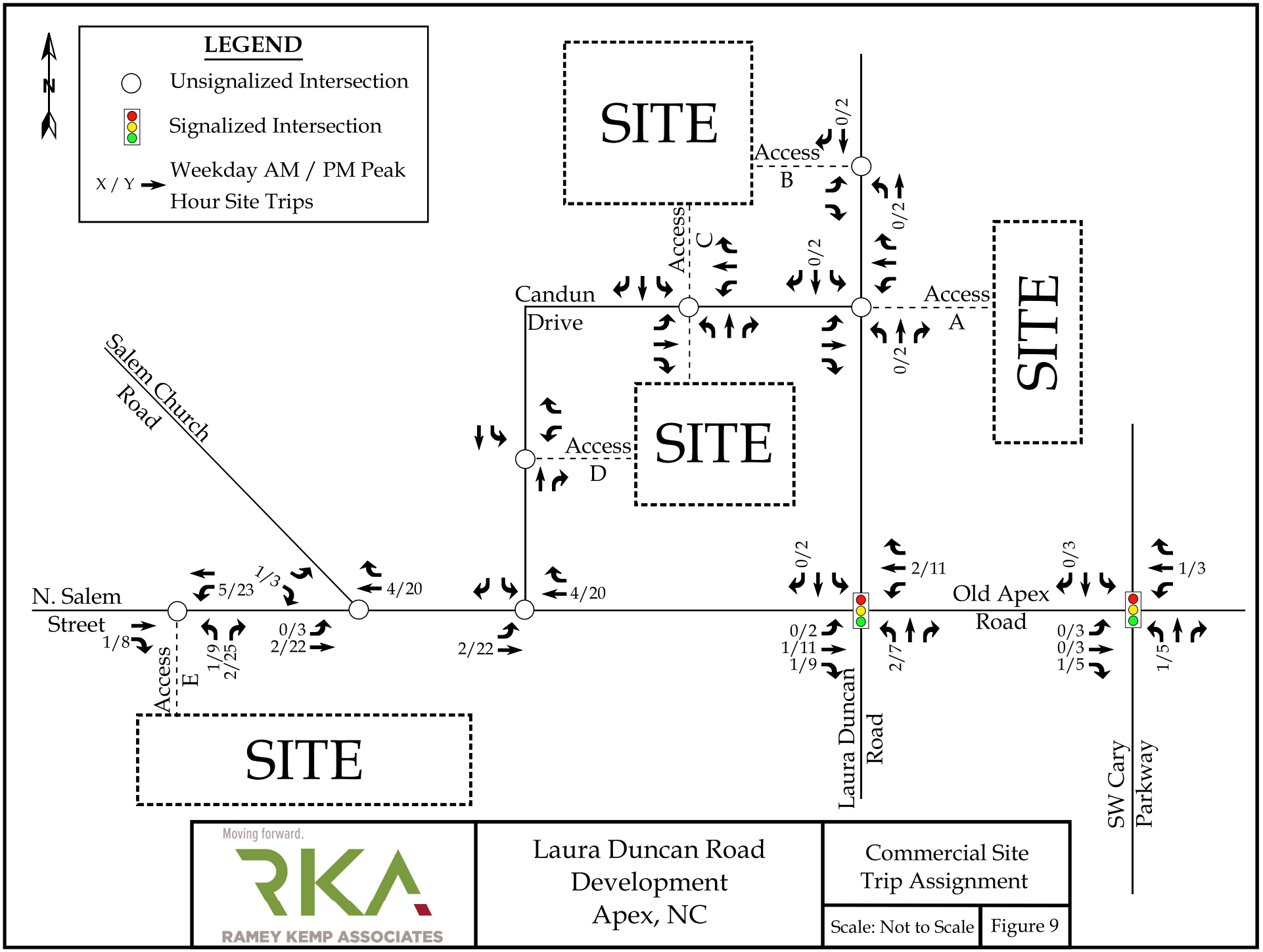
Laura Duncan Road
Development
Apex, NC

Residential
Site Trip Assignment

Scale: Not to Scale | Figure 8



Moving forward.
RKA
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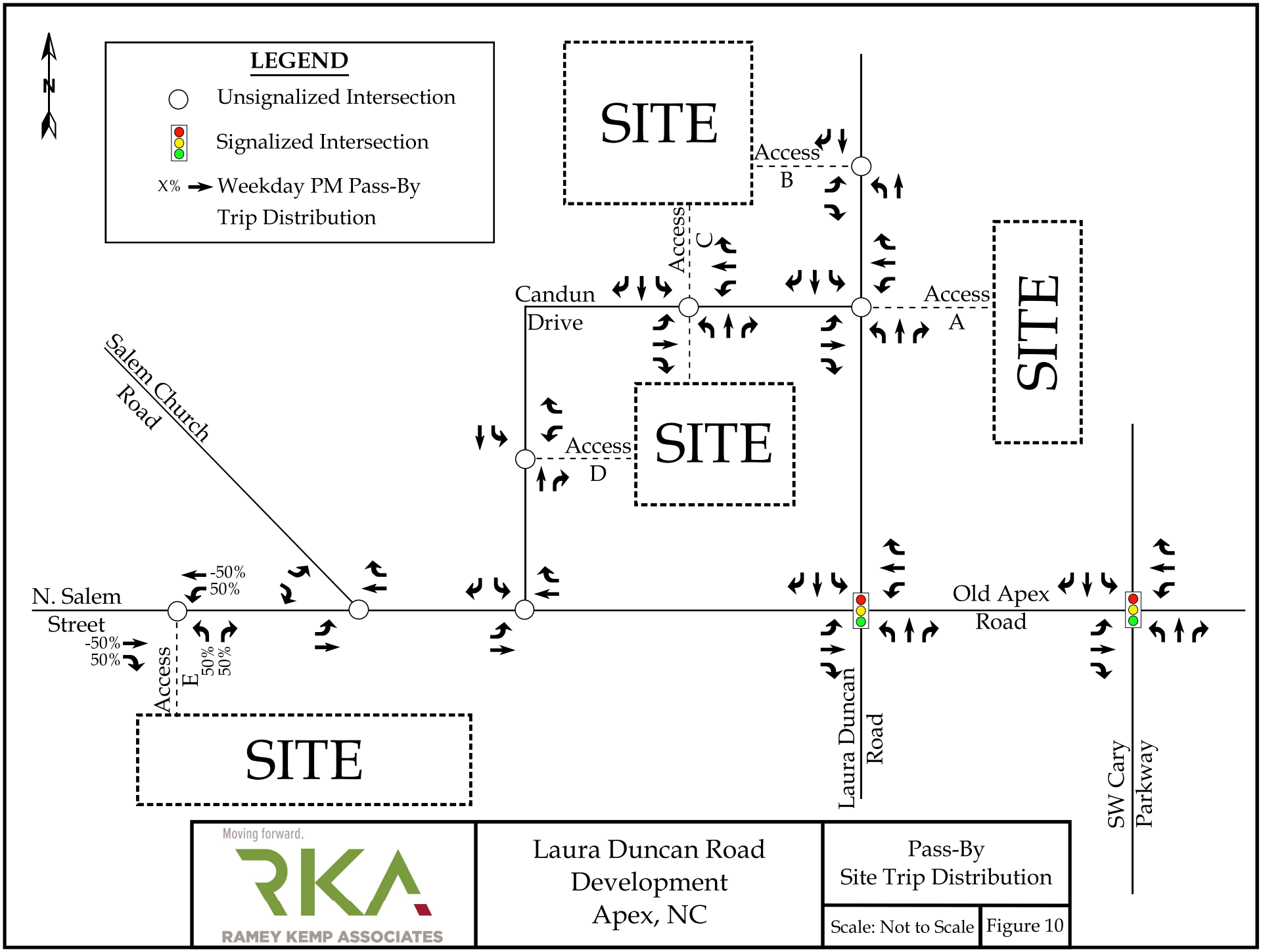
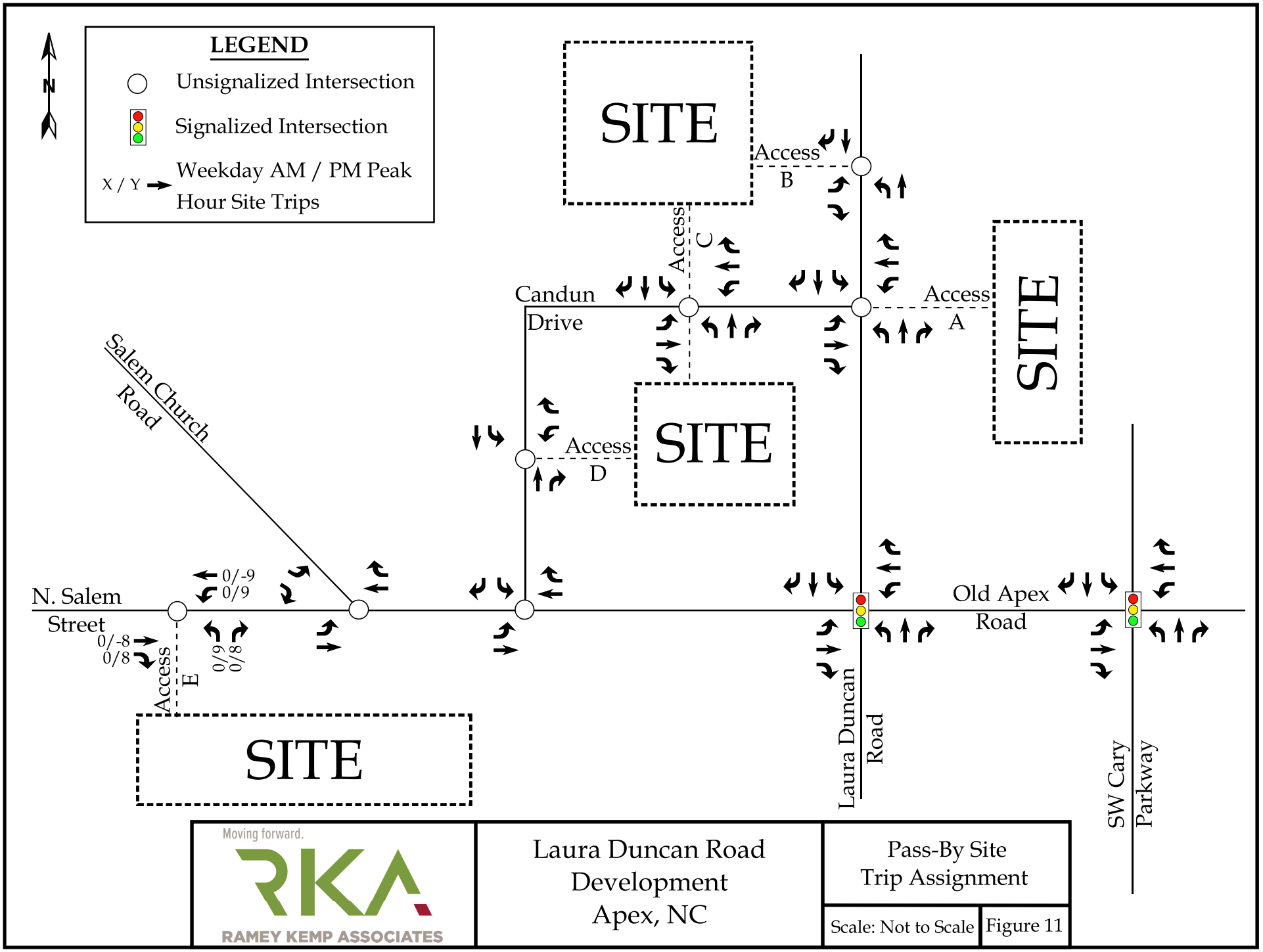
Laura Duncan Road Development
Apex, NC

Commercial Site Trip Assignment

Scale: Not to Scale | Figure 9


LEGEND
Unsignalized Intersection
Signalized Intersection
X% Weekday PM Pass-By Trip Distribution
N
SITE
SITE
SITE
SITE
Access B
Access C
Access A
Access D
Access E
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
-50%
50%
-50%
50%
50%
50%
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development
Apex, NC
Pass-By Site Trip Distribution
Scale: Not to Scale
Figure 10

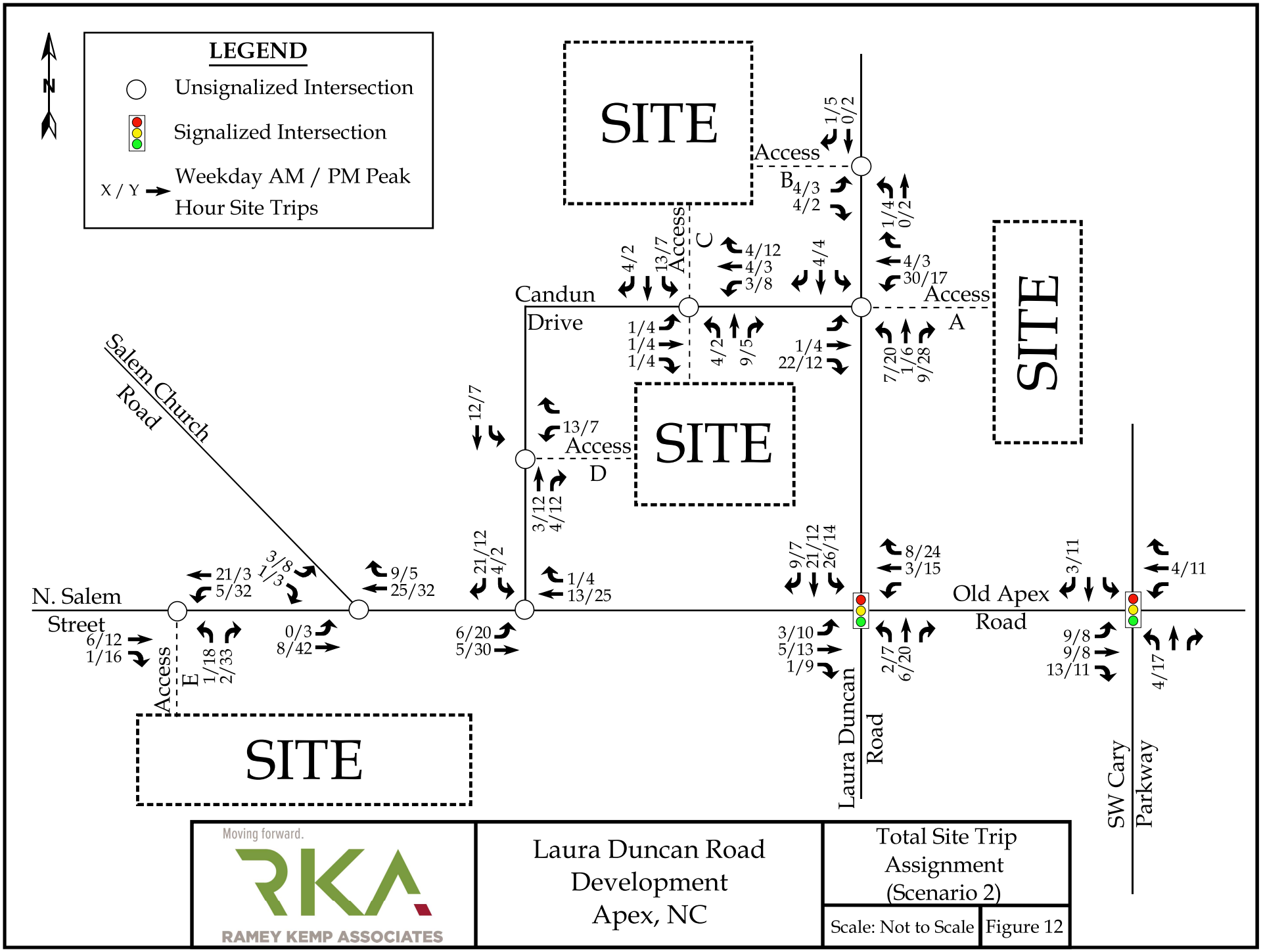


Moving forward.
RKA
RAMEY KEMP ASSOCIATES

Laura Duncan Road
Development
Apex, NC

Pass-By Site
Trip Assignment

Scale: Not to Scale | Figure 11



Moving forward.
RKA
RAMEY KEMP ASSOCIATES

Laura Duncan Road Development
Apex, NC

Total Site Trip Assignment (Scenario 2)

Scale: Not to Scale | Figure 12

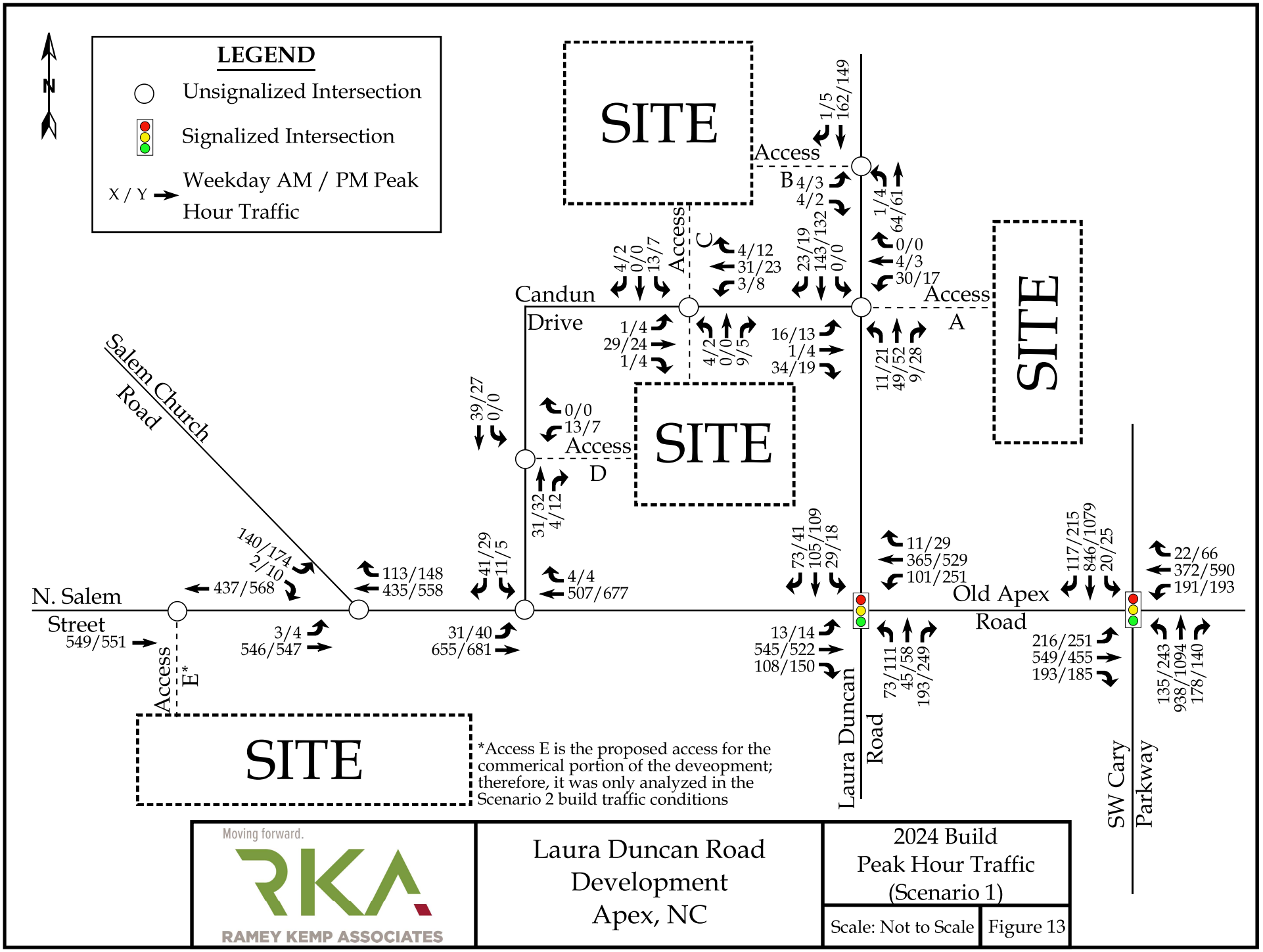
5. 2024 BUILD TRAFFIC CONDITIONS

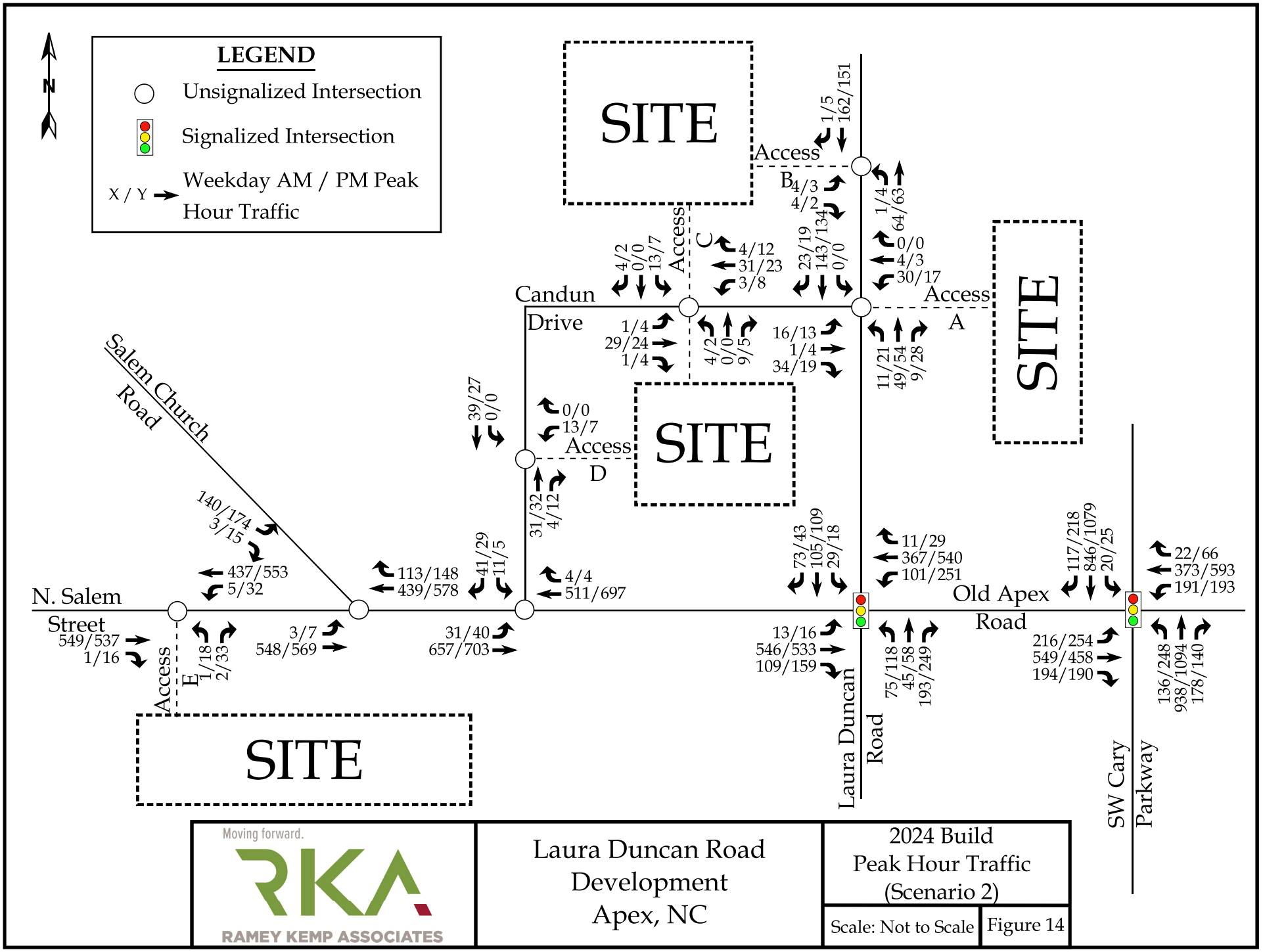
5.1. 2024 Build Peak Hour Traffic Volumes

To estimate traffic conditions with the site built out, the residential site trips (Figure 8) were added to the 2024 no-build traffic volumes (Figure 5) to determine the 2024 build traffic volumes (Scenario 1) and the total site trips (Figure 12) were added to the 2024 no-build traffic volumes (Figure 5) to determine the 2024 build traffic volumes (Scenario 2). Refer to Figures 13 and 14 for an illustration of the 2024 build peak hour traffic volumes for Scenario 1 (Residential) and Scenario 2 (Residential + Commercial), respectively.

5.2. Analysis of 2024 Build Peak Hour Traffic Conditions

Study intersections were analyzed with the 2024 build traffic volumes using the same methodology previously discussed for existing and no-build 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
N
SITE
SITE
SITE
Access B
Access C
Access A
Access D
Access E*
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
1/5 162/149
4/3 4/2
1/4 64/61
4/2 0/0 13/7
4/12 31/23 3/8
23/19 143/132 0/0
0/0 4/3 30/17
1/4 29/24 1/4
4/2 0/0 9/5
16/13 1/4 34/19
11/21 49/52 9/28
39/27 0/0
0/0 13/7
31/32 4/12
140/174 2/10 437/568
113/148 435/558
41/29 11/5
4/4 507/677
73/41 105/109 29/18
11/29 365/529 101/251
117/215 846/1079 20/25
22/66 372/590 191/193
549/551
3/4 546/547
31/40 655/681
13/14 545/522 108/150
73/111 45/58 193/249
216/251 549/455 193/185
135/243 938/1094 178/140
*Access E is the proposed access for the commerical portion of the deveopment; therefore, it was only analyzed in the Scenario 2 build traffic conditions
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development Apex, NC
2024 Build Peak Hour Traffic (Scenario 1)
Scale: Not to Scale
Figure 13



Moving forward.
RKA
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Laura Duncan Road Development
Apex, NC

2024 Build Peak Hour Traffic (Scenario 2)

Scale: Not to Scale | Figure 14

6. TRAFFIC ANALYSIS PROCEDURE

Study intersections were analyzed using the methodology outlined in the *Highway Capacity Manual* (HCM), 6th 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 Congestions Management Guidelines with one exception. The signalized intersections of N.

Salem Street / Old Apex Road & Laura Duncan Road and Old Apex Road & Cary Parkway were analyzed with right-turn-on-red (RTOR) operation under all analysis scenarios. NCDOT Congestion Management Guidelines indicate that RTOR operation should not be included for analysis of existing or future operations; however, RTOR was considered at this intersection to replicate field conditions where this movement is currently permitted.

7. CAPACITY ANALYSIS

7.1. N. Salem Street/Old Apex Road and Laura Duncan Road

The existing signalized intersection of N. Salem Street/Old Apex Road and Laura Duncan Road was analyzed under 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] traffic conditions with the lane configurations and traffic control shown in Table 5. Refer to Table 5 for a summary of the analysis results. Refer to Appendix D for the Synchro capacity analysis reports.

Table 5: Analysis Summary of N. Salem Street/Old Apex Road and Laura Duncan Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2021 Existing	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C A C B	B (20)	D B F D	D (39)
2024 No-Build	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C A C C	C (22)	E C E D	D (48)
2024 Build – Scenario 1 [Residential]	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C B D C	C (24)	E C E D	D (51)
2024 Build – Scenario 2 [Residential + Commercial]	EB WB NB SB	1 LT, 1 TH-RT 1 LT, 1 TH, 1 RT 1 LT-TH-RT 1 LT, 1 TH-RT	C B D C	C (26)	F C E C	E (57)

Capacity analysis indicates that this intersection currently operates at an overall LOS B during the weekday AM peak hour and an overall LOS D during the weekday PM peak hour. Under 2024 no-build and 2024 build traffic conditions (Scenario 1), this intersection is expected to operate at an overall LOS C during the weekday AM peak hour and continue operating at an overall LOS D during the weekday PM peak hour. Under 2024 build traffic conditions (Scenario 2), this intersection is expected to continue operating at an overall LOS C during the weekday AM peak hour and operate at an overall LOS E during the weekday PM

peak hour. It should be noted that this intersection is expected to operate near capacity, with moderate delays and queuing, during the weekday PM peak hour under future traffic conditions regardless of whether or not the proposed development is constructed. During the weekday PM peak hour, the proposed development is expected to account for less than 5% of the overall traffic at this intersection under 2024 build traffic conditions (Scenario 1) and less than 7% of the overall traffic under 2024 build traffic conditions (Scenario 2). Additionally, this intersection is expected to operate near the LOS D/E threshold (55 seconds) during the weekday PM peak hour under future traffic conditions whether or not the proposed development is constructed.

Signal timing modifications were considered at this intersection during the weekday PM peak hour to mitigate the increase in overall intersection delay under 2024 build traffic conditions (Scenario 2); however, this intersection is a part of the Town of Cary's coordinated signal system and any signal timing modifications at one (1) intersection should be discussed with Town of Cary staff to ensure any modifications will not have adverse impacts on the day-to-day signal operations along the corridor. Due to the reasons outlined above, no improvements are recommended at this intersection.

7.2. Laura Duncan Road and Candun Drive/Access A

The existing unsignalized intersection of Laura Duncan Road and Candun Drive was analyzed under 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] traffic conditions with the lane configurations and traffic control shown in Table 6. Access A is expected to align with Candun Drive under 2024 build conditions (Scenario 1 and Scenario 2), creating a 4th leg at this intersection. Refer to Table 6 for a summary of the analysis results. Refer to Appendix E for the Synchro capacity analysis reports.

Table 6: Analysis Summary of Laura Duncan Road and Candun Drive/Access A

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2021 Existing	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A[2] A[1] --	N/A	A[2] A[1] --	N/A
2024 No-Build	EB NB SB	1 LT-RT 1 LT-TH 1 TH-RT	A[2] A[1] --	N/A	A[2] A[1] --	N/A
2024 Build – Scenario 1 [Residential]	EB **WB** NB SB	1 LT-**TH**-RT **1 LT-TH-RT** 1 LT-TH-**RT** 1 **LT**-TH-RT	B[2] B[2] A[1] A[1]	N/A	B[2] B[2] A[1] A[1]	N/A
2024 Build – Scenario 2 [Residential + Commercial]	EB **WB** NB SB	1 LT-**TH**-RT **1 LT-TH-RT** 1 LT-TH-**RT** 1 **LT**-TH-RT	B[2] B[2] A[1] A[1]	N/A	B[2] B[2] A[1] A[1]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Improvements to lane configurations are shown in bold.

Capacity analysis indicates that the major-street left turn movement and the minor-street approach at this intersection are expected to operate at LOS A during the weekday AM and PM peak hours under 2021 existing and 2024 no-build traffic conditions.

Under 2024 build conditions (Scenario 1 and Scenario 2), the minor-street approaches are expected to operate at LOS B during the weekday AM and PM peak hours while the major-

street left-turn movements are expected to operate at LOS A during the weekday AM and PM peak hours. Exclusive turn lanes were considered at this intersection based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*; however, given the relatively low projected traffic volumes on Laura Duncan Road and Candun Drive under 2024 build conditions (Scenario 1 and Scenario 2), no turn lanes are recommended at this intersection. Refer to Appendix M for a copy of the turn lane warrants.

7.3. N. Salem Street and Candun Drive

The existing unsignalized intersection of N. Salem Street and Candun Drive was analyzed under 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] 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 F for the Synchro capacity analysis reports.

Table 7: Analysis Summary of N. Salem Street and Candun Drive

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2021 Existing	EB WB SB	1 LT, 1 TH 1 TH-RT 1 LT-RT	A[1] -- B[2]	N/A	A[1] -- B[2]	N/A
2024 No-Build	EB WB SB	1 LT, 1 TH 1 TH-RT 1 LT-RT	A[1] -- B[2]	N/A	A[1] -- C[2]	N/A
2024 Build – Scenario 1 [Residential]	EB WB SB	1 LT, 1 TH 1 TH-RT 1 LT-RT	A[1] -- B[2]	N/A	A[1] -- C[2]	N/A
2024 Build – Scenario 2 [Residential + Commercial]	EB WB SB	1 LT, 1 TH 1 TH-RT 1 LT-RT	A[1] -- B[2]	N/A	A[1] -- C[2]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates that the major street left-turn movement at this intersection is expected to operate at LOS A during the weekday AM and PM peak hours under all traffic conditions. The minor-street approach is expected to operate at LOS B during the weekday AM peak hour and LOS C or better during the weekday PM peak hour for all traffic conditions.

7.4. N. Salem Street and Salem Church Road

The existing unsignalized intersection of N. Salem Street and Salem Church Road was analyzed under 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] 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 G for the Synchro capacity analysis reports.

Table 8: Analysis Summary of N. Salem Street and Salem Church Road

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2021 Existing	EB WB SB	1 LT-TH 1 TH, 1 RT 1 LT, 1 RT	A[1] -- D[2]	N/A	A[1] -- E[2]	N/A
2024 No-Build	EB WB SB	1 LT-TH 1 TH, 1 RT 1 LT, 1 RT	A[1] -- E[2]	N/A	A[1] -- F[2]	N/A
2024 Build – Scenario 1 [Residential]	EB WB SB	1 LT-TH 1 TH, 1 RT 1 LT, 1 RT	A[1] -- E[2]	N/A	A[1] -- F[2]	N/A
2024 Build – Scenario 2 [Residential + Commercial]	EB WB SB	**1 LT**, 1 TH 1 TH, 1 RT 1 LT, 1 RT	A[1] -- C[2]	N/A	A[1] -- D[2]	N/A

1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Improvements to lane configurations are shown in bold.

Capacity analysis indicates that the major street left-turn movement at this intersection is expected to operate at LOS A during the weekday AM and PM peak hours under all traffic conditions. Under 2024 no-build traffic conditions, the minor-street approach is expected to operate at LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour.

Under 2024 build traffic conditions (Scenario 1) the minor-street approach is expected to continue operating at LOS E during the weekday AM peak hour and LOS F during the

weekday PM peak hour. Under 2024 build traffic conditions (Scenario 2), it is recommended the developer widen N. Salem Street to a three-lane cross section to provide an exclusive left-turn at the intersection of N. Salem Street and Access E resulting in a continuation of the existing two-way left-turn lane on either side of this intersection. With the addition of an eastbound left-turn lane at this intersection under 2024 build traffic conditions (Scenario 2), the minor street approach is expected to operate at LOS D or better during the weekday AM and PM peak hours.

It should be noted that these levels of service are not uncommon from stop-controlled minor street approaches with heavy mainline traffic volumes. The peak hour signal warrant from the *Manual on Uniform Traffic Control Devices* (MUTCD) was considered and this intersection meets the peak hour warrants for both the weekday AM and PM peak hours under 2021 existing traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour and 4-hour warrants, which NCDOT favors for installation of a traffic signal. These longer period warrants are not typically met for residential area due to the distinct peak hour traffic periods for this type of development. According to the Town's 2045 Thoroughfare and Collector Street Plan, this intersection is identified as a future roundabout; however, based on coordination with Town staff, this improvement is not currently funded and was therefore not considered in the analysis of future traffic conditions.

7.5. Old Apex Road and Cary Parkway

The existing signalized intersection of Old Apex Road and Cary Parkway was analyzed under 2021 existing, 2024 no-build, 2024 build Scenario 1 [residential] and 2024 build Scenario 2 [residential + commercial] 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 H for the Synchro capacity analysis reports.

Table 9: Analysis Summary of Old Apex Road and Cary Parkway

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2021 Existing	EB WB NB SB	1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 2 TH, 1 RT	E E D D	D (47)	F E D D	E (56)
2024 No-Build	EB WB NB SB	1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 2 TH, 1 RT	E E D D	D (50)	F E D D	E (62)
2024 Build – Scenario 1 [Residential]	EB WB NB SB	1 LT1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 2 TH, 1 RT	E E D D	D (50)	F E D D	E (63)
2024 Build – Scenario 2 [Residential + Commercial]	EB WB NB SB	1 LT1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 1 TH, 1 TH-RT 1 LT, 2 TH, 1 RT	E E D D	D (50)	F E D D	E (63)

Capacity analysis of indicates the intersection of Old Apex Road and Cary Parkway is expected to operate at an overall LOS D during the weekday AM peak hour and an overall LOS E during the weekday PM peak hour under all traffic conditions. Due the minimal impacts site traffic is expected to have when comparing 2024 no-build traffic conditions to 2024 build traffic conditions (Scenario 1 and Scenario 2), no improvements are recommended at this intersection.

7.6. Laura Duncan Road and Access B

The proposed unsignalized intersection of Laura Duncan Road and Access B was analyzed under 2024 build traffic conditions (Scenario 1 and Scenario 2) with the lane configurations and traffic control shown in Table 10. Refer to Table 10 for a summary of the analysis results. Refer to Appendix I for the Synchro capacity analysis reports.

Table 10: Analysis Summary of Laura Duncan Road and Access B

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2024 Build – Scenario 1 [Residential]	**EB** NB SB	**1 LT-RT** **1 LT-**TH 1 TH-**RT**	A[2] A[1] --	N/A	A[2] A[1] --	N/A
2024 Build – Scenario 2 [Residential + Commercial]	**EB** NB SB	**1 LT-RT** **1 LT-**TH 1 TH-**RT**	A[2] A[1] --	N/A	A[2] A[1] --	N/A

Improvements to lane configurations are shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates that the major-street left-turn movement and minor-street approach at this intersection are expected to operate at LOS A during the weekday AM and PM peak hours under 2024 build traffic conditions (Scenario 1 and Scenario 2).

Exclusive turn lanes were considered at this intersection based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*; however, given the relatively low projected traffic volumes on Laura Duncan Road under 2024 build conditions (Scenario 1 and Scenario 2), no turn lanes are recommended at this intersection. Refer to Appendix M for a copy of the turn lane warrants.

7.7. Candun Drive and Access C

The proposed unsignalized intersection of Candun Drive and Access C was analyzed under 2024 build traffic conditions (Scenario 1 and Scenario 2) with the lane configurations and traffic control shown in Table 11. Refer to Table 11 for a summary of the analysis results. Refer to Appendix J for the Synchro capacity analysis reports.

Table 11: Analysis Summary of Candun Drive and Access C

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2024 Build – Scenario 1 [Residential]	EB	1 **LT**-TH-**RT**	A[1]	N/A	A[1]	N/A
	WB	1 **LT**-TH-**RT**	A[1]		A[1]	
	NB	**1 LT-TH-RT**	A[2]		A[2]	
	SB	**1 LT-TH-RT**	A[2]		A[2]	
2024 Build – Scenario 2 [Residential + Commercial]	EB	1 **LT**-TH-**RT**	A[1]	N/A	A[1]	N/A
	WB	1 **LT**-TH-**RT**	A[1]		A[1]	
	NB	**1 LT-TH-RT**	A[2]		A[2]	
	SB	**1 LT-TH-RT**	A[2]		A[2]	

Improvements to lane configurations are shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates that all major-street left-turn movements and minor-street approaches at this intersection are expected to operate at LOS A during the weekday AM and PM peak hours under 2024 build traffic conditions (Scenario 1 and Scenario 2).

Exclusive turn lanes were considered at this intersection based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*; however, given the relatively low projected traffic volumes on Candun Drive under 2024 build conditions (Scenario 1 and Scenario 2), no turn lanes are recommended at this intersection. Refer to Appendix M for a copy of the turn lane warrants.

7.8. Candun Drive and Access D

The proposed unsignalized intersection of Candun Drive and Access D was analyzed under 2024 build traffic conditions (Scenario 1 and Scenario 2) with the lane configurations and traffic control shown in Table 12. Refer to Table 12 for a summary of the analysis results. Refer to Appendix K for the Synchro capacity analysis reports.

Table 12: Analysis Summary of Candun Drive and Access D

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2024 Build – Scenario 1 [Residential]	**WB** NB SB	**1 LT-RT** 1 TH-**RT** 1 **LT**-TH	A[2] -- A[1]	N/A	A[2] -- A[1]	N/A
2024 Build – Scenario 2 [Residential + Commercial]	**WB** NB SB	**1 LT-RT** 1 TH-**RT** 1 **LT**-TH	A[2] -- A[1]	N/A	A[2] -- A[1]	N/A

Improvements to lane configurations are shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates that the major-street left-turn movement and minor-street approach at this intersection are expected to operate at LOS A during the weekday AM and PM peak hours under 2024 build traffic conditions (Scenario 1 and Scenario 2).

Exclusive turn lanes were considered at this intersection based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*; however, given the relatively low projected traffic volumes on Candun Drive under 2024 build conditions (Scenario 1 and Scenario 2), no turn lanes are recommended at this intersection. Refer to Appendix M for a copy of the turn lane warrants.

7.9. N. Salem Street and Access E

The proposed unsignalized intersection of N. Salem Street and Access E was analyzed under 2024 build traffic conditions (Scenario 2) with the lane configurations and traffic control shown in Table 13. Refer to Table 13 for a summary of the analysis results. Refer to Appendix L for the Synchro capacity analysis reports.

Table 13: Analysis Summary of N. Salem Street and Access E

ANALYSIS SCENARIO	APPROACH	LANE CONFIGURATIONS	WEEKDAY AM PEAK HOUR LEVEL OF SERVICE		WEEKDAY PM PEAK HOUR LEVEL OF SERVICE	
			Approach	Overall (seconds)	Approach	Overall (seconds)
2024 Build – Scenario 2 [Residential + Commercial]	EB WB **NB**	1 TH-**RT** 1 **LT**, 1 TH **1 LT-RT**	-- A[1] B[2]	N/A	-- A[1] C[2]	N/A

Improvements to lane configurations are shown in bold.
1. Level of service for major-street left-turn movement.
2. Level of service for minor-street approach.

Capacity analysis indicates the major-street left-turn movement at this intersection is expected to operate at LOS A during the weekday AM and PM peak hours under 2024 build traffic conditions (Scenario 2). The minor-street approach is expected to operate at LOS C or better during the weekday AM and PM peak hours under 2024 build traffic conditions (Scenario 2).

It is recommended that the developer widen N. Salem Street to a three-lane cross section to provide an exclusive left-turn lane at this intersection resulting in a continuation of the existing two-way left-turn lane on N. Salem Street on either of its intersection with Salem Church Road. Therefore, an exclusive westbound left-turn lane was analyzed. An exclusive right-turn lane was considered at this intersection based on the NCDOT *Policy on Street and Driveway Access to North Carolina Highways*; however, given the minimal right turn projected site traffic under 2024 build conditions (Scenario 2), an exclusive right-turn lane is not recommended at this intersection. Refer to Appendix M for a copy of the turn lane warrants.

8. CONCLUSIONS

This Traffic Impact Analysis was conducted to determine the potential traffic impacts of the proposed Laura Duncan Road Development, located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan Road in Apex, North Carolina. The proposed development, anticipated to be completed in 2024, is assumed to consist of approximately 240 apartment units and a commercial outparcel south of the intersection of N. Salem Street and Salem Church Road. Based on a review of the commercial outparcel and the setback requirements from N. Salem Street and the CSX Rail Line, the commercial outparcel will realistically only have one (1) acre of developable land. The remaining ~1.5 acres will be dedicated as resource conservation area (RCA) or as right-of-way/land for the future roundabout at the intersection of N. Salem Street and Salem Church Road per the Town's Comprehensive Transportation Plan (CTP). It should be noted that the commercial outparcel land use(s) and intensity are unknown at this time. Therefore, 10,000 square feet of general retail space per acre of developable land [1 acre in total] was assumed for the commercial outparcel.

Access to the residential portion of the site is proposed via two (2) full movement access points along Laura Duncan Road and two (2) full movement access points along Candun Drive. Access to the commercial outparcel is proposed via one (1) full movement access point along N. Salem Street.

The study analyzes traffic conditions during the weekday AM and PM peak hours for the following scenarios to provide analysis with and without the commercial outparcel upon build-out of the proposed development:

- 2021 Existing Traffic Conditions
- 2024 No-Build Traffic Conditions
- 2024 Build Traffic Conditions – Scenario 1 [Residential]
- 2024 Build Traffic Conditions – Scenario 2 [Residential + Commercial]

Trip Generation

For Scenario 1 [Residential], it is estimated that the proposed development will generate approximately 1,774 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 110 trips (25 entering and 85 exiting) will occur during the weekday AM peak hour and 129 trips (81 entering and 48 exiting) will occur during the weekday PM peak hour.

For Scenario 2 [Residential + Commercial], it is estimated that the proposed development will generate approximately 3,030 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic volume, it is anticipated that 119 trips (31 entering and 88 exiting) will occur during the weekday AM peak hour and 194 trips (112 entering and 94 exiting) will occur during the weekday PM peak hour after the reduction for pass-by trips.

Adjustments to Analysis Guidelines

Capacity analysis at all study intersections was completed according to 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:

N. Salem Street/Old Apex Road and Laura Duncan Road

Under 2024 build traffic conditions (Scenario 2), this intersection is expected to operate at an overall LOS C during the weekday AM peak hour and an overall LOS E during the weekday PM peak hour. It should be noted that this intersection is expected to operate near capacity, with moderate delays and queuing, during the weekday PM peak hour under future traffic conditions regardless of whether or not the proposed development is constructed. During the weekday PM peak hour, the proposed development is expected to account for less than 5% of

the overall traffic at this intersection under 2024 build traffic conditions (Scenario 1) and less than 7% of the overall traffic under 2024 build traffic conditions (Scenario 2). Additionally, this intersection is expected to operate near the LOS D/E threshold (55 seconds) during the weekday PM peak hour under future traffic conditions whether or not the proposed development is constructed.

Signal timing modifications were considered at this intersection during the weekday PM peak hour to mitigate the increase in overall intersection delay under 2024 build traffic conditions (Scenario 2); however, this intersection is a part of the Town of Cary's coordinated signal system and any signal timing modifications at one (1) intersection should be discussed with Town of Cary staff to ensure any modifications will not have adverse impacts on the day-to-day signal operations along the corridor. Due to the reasons outlined above, no improvements are recommended at this intersection.

N. Salem Street and Salem Church Road

Under 2024 no-build and 2024 build traffic conditions (Scenario 1), the minor-street approach is expected to operate at LOS E during the weekday AM peak hour and LOS F during the weekday PM peak hour. Under 2024 build traffic conditions (Scenario 2), it is recommended the developer widen N. Salem Street to a three-lane cross section to provide an exclusive left-turn at the intersection of N. Salem Street and Access E resulting in a continuation of the existing two-way left-turn lane on either side of this intersection. With the addition of an eastbound left-turn lane at this intersection under 2024 build traffic conditions (Scenario 2), the southbound minor street approach is expected to operate at LOS D or better during the weekday AM and PM peak hours.

It should be noted that these levels of service are not uncommon from stop-controlled minor street approaches with heavy mainline traffic volumes. The peak hour signal warrant from the *Manual on Uniform Traffic Control Devices* (MUTCD) was considered and this intersection meets the peak hour warrants for both the weekday AM and PM peak hours under 2021 existing traffic conditions. It is not expected that this intersection would satisfy the MUTCD 8-hour and 4-hour warrants, which NCDOT favors for installation of a traffic signal. These

longer period warrants are not typically met for residential area due to the distinct peak hour traffic periods for this type of development. According to the Town's 2045 Thoroughfare and Collector Street Plan, this intersection is identified as a future roundabout; however, based on coordination with Town staff, this improvement is not currently funded and was therefore not considered in the analysis of future traffic conditions.

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 15 for an illustration of the recommended lane configuration for the proposed development.

Recommended Improvements by Developer – Scenario 1 [Residential]

Laura Duncan Road and Candun Drive/Access A

- Construct the westbound approach with one ingress and one egress lane.
- Provide stop control for the westbound approach.

Laura Duncan Road and Access B

- Construct the eastbound approach with one ingress and one egress lane.
- Provide stop control for the eastbound approach.

Candun Drive and Access C

- Construct the northbound and southbound approaches with one ingress and one egress lane.
- Provide stop control for the northbound and southbound approaches.

Candun Drive and Access D

- Construct the westbound approach with one ingress and one egress lane.
- Provide stop control for the westbound approach.

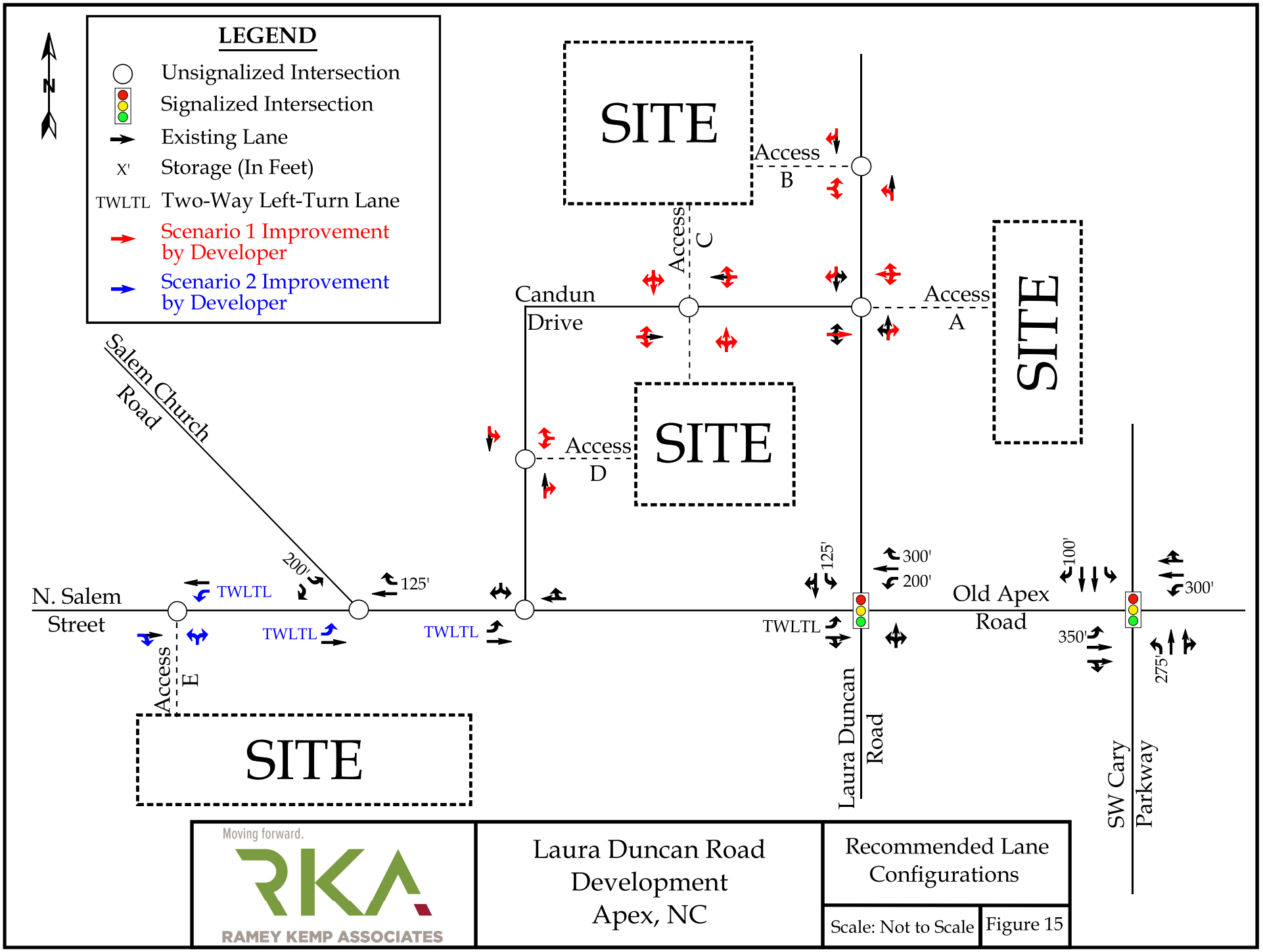
Recommended Improvements by Developer – Scenario 2 [Residential + Commercial]

N. Salem Street

- Widen N. Salem Street to a three-lane cross-section providing a continuation of the existing two-way left-turn lane on either of its intersection with Salem Church Road

N. Salem Street and Access E

- Provide an exclusive westbound left-turn lane on N. Salem Street [two-way left-turn lane].
- Construct the northbound approach with one ingress and one egress lane.
- Provide stop control for the northbound approach.


LEGEND
Unsignalized Intersection
Signalized Intersection
Existing Lane
X' Storage (In Feet)
TWLTL Two-Way Left-Turn Lane
Scenario 1 Improvement by Developer
Scenario 2 Improvement by Developer
N
SITE
SITE
SITE
SITE
Access B
Access C
Access A
Access D
Access E
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
TWLTL
TWLTL
TWLTL
TWLTL
200'
125'
125'
300'
200'
100'
300'
350'
275'
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development Apex, NC
Recommended Lane Configurations
Scale: Not to Scale
Figure 15

TECHNICAL APPENDIX

APPENDIX A

MEMORANDUM OF UNDERSTANDING

RAMEY KEMP ASSOCIATES
Moving forward.

T 919 872 5115

5808 Faringdon Place
Raleigh, NC 27609

November 24, 2021

Serge Grebenschikov, PE
Traffic Engineer
Public Works & Transportation – Traffic
73 Hunter Street, 3rd Fl
PO Box 250
Apex, NC 27502

Reference: Laura Duncan Road Development
Apex, North Carolina

Subject: **REVISED** Memorandum of Understanding for TIA Report

Dear Mr. Grebenschikov:

The following is a Memorandum of Understanding (MOU) outlining the proposed scope of work and assumptions related to the Traffic Impact Analysis (TIA) for the proposed Laura Duncan Road Development, located north of N. Salem Street / Old Apex Road, on both sides of Laura Duncan Road in Apex, North Carolina. The development is anticipated to consist of approximately 240 apartment units and a commercial outparcel south of the intersection of N. Salem Street and Salem Church Road. The development is expected to be fully built-out by 2024. Access to the residential portion of the site is proposed via two (2) full movement access points along Laura Duncan Road and two (2) full movement access points along Candun Drive. Access to the commercial outparcel is proposed via one (1) full movement access point along N. Salem Street.

Study Area

Based on coordination with the North Carolina Department of Transportation (NCDOT), the Town of Apex (Town), and Town of Cary staff, the study area is proposed to consist of the following intersections:

- N. Salem Street / Old Apex Road and Laura Duncan Road
- Laura Duncan Road and Candun Drive
- N. Salem Street and Candun Drive
- N. Salem Street and Salem Church Road
- Old Apex Road and Cary Parkway

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:

- 2021 Existing Traffic Conditions

- 2024 No-Build Traffic Conditions
- 2024 Build Traffic Conditions Phase 1 [Residential]
- 2024 Build Traffic Conditions Full Build-Out [Residential + Commercial]
- 2024 Build Traffic Conditions with Improvements [*if necessary*]

Existing Traffic Volumes

Peak hour counts were conducted at all study intersections [except Old Apex Road and Cary Parkway] in September of 2021, during weekday AM (7:00 to 9:00 AM) and weekday PM (4:00 to 6:00 PM) peak hours. It should be noted that the schools in the surrounding area were in session and operating under typical operations at the time traffic counts were collected.

Traffic counts at the intersection of Old Apex Road and Cary Parkway from the Town of Cary (21-TAR-460) will be utilized for analysis purposes. All COVID factor adjustment methodology from 21-TAR-460 will be utilized for the existing peak hour traffic volumes at this intersection. Traffic counts were collected in August of 2021 while schools were not in session and during the effects of the COVID-19 pandemic. Traffic counts from May of 2019 at this intersection were available from the Town of Cary which were collected when schools were in session. Based on a comparison of grown 2021 counts (May 2019 counts grown to 2021 using a 1% growth rate) and the August 2021 counts, adjustment factors of 1.25 and 1.33 were calculated and applied [to the August 2021 traffic counts] to determine the new weekday AM and PM peak hour traffic volumes, respectively.

No-Build Traffic Volumes

Per coordination with NCDOT and the Town, no-build traffic volumes will be determined by projecting existing (2021) traffic volumes to 2024 using a 3% annually compounded growth rate.

It was determined through coordination with the review agencies that there are no adjacent developments to be considered in this study.

Trip Generation

Average weekday daily and peak hour trips for the proposed site were calculated utilizing methodology contained within the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition. Refer to Tables 1a and 1b for a detailed breakdown of the trip generations for Phase 1 and Full Build-Out, respectively.

Table 1a: Trip Generation Summary – Phase 1

Land Use	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Multifamily Low-Rise Apartments (220)	240 units	1,774	25	85	81	48

It is estimated that the residential portion of the proposed development (Phase 1) will generate approximately 1,774 total site trips on the roadway network during a typical 24-hour weekday period. Of the daily traffic

volume, it is anticipated that 110 trips (25 entering and 85 exiting) will occur during the weekday AM peak hour and 129 trips (81 entering and 48 exiting) will occur during the weekday PM peak hour.

Table 1b: Trip Generation Summary – Full Build-Out

Land Use	Intensity	Daily Traffic (vpd)	AM Peak Hour Trips (vph)		PM Peak Hour Trips (vph)	
			Enter	Exit	Enter	Exit
Multifamily Low-Rise Apartments (220)	240 units	1,774	25	85	81	48
Retail (820)	10,000* SF	1,256	6^	3^	48	51
Total Trips			**31**	**88**	**129**	**99**
Pass-By Trips [0% AM, 34% PM]			*-0*	*-0*	*-17*	*-17*
Total External Trips			**31**	**88**	**112**	**82**

*Since the commercial outparcel land use is unknown at this time, 10,000 SF of general retail space per acre [1 acre in total] was assumed for this land use.
^Rates were used instead of equations for generating AM peak hour trips

It is estimated that Full Build-Out of the proposed development will generate approximately 3,030 total site trips on the roadway network during a typical 24-hour weekday period. After the reduction of pass-by trips, it is anticipated that 119 trips (31 entering and 88 exiting) will occur during the weekday AM peak hour and 194 trips (112 entering and 82 exiting) will occur during the weekday PM peak hour. It should be noted that reductions due to internal capture were not accounted for to provide for a conservative analysis.

Trip Distribution

The site trips were distributed based on a combination of existing traffic patterns, population centers adjacent to the study area, and engineering judgment. A summary of the proposed site trip distribution is below:

- 25% to/from the south via Laura Duncan Road
- 5% to/from the north via Laura Duncan Road
- 25% to/from the west via N. Salem Street
- 10% to/from the east via Old Apex Road
- 10% to/from the west via Salem Church Road
- 10% to/from the north via Cary Parkway
- 15% to/from the south via Cary Parkway

Refer to the attachments for the figures showing the anticipated site trip distributions for the site.

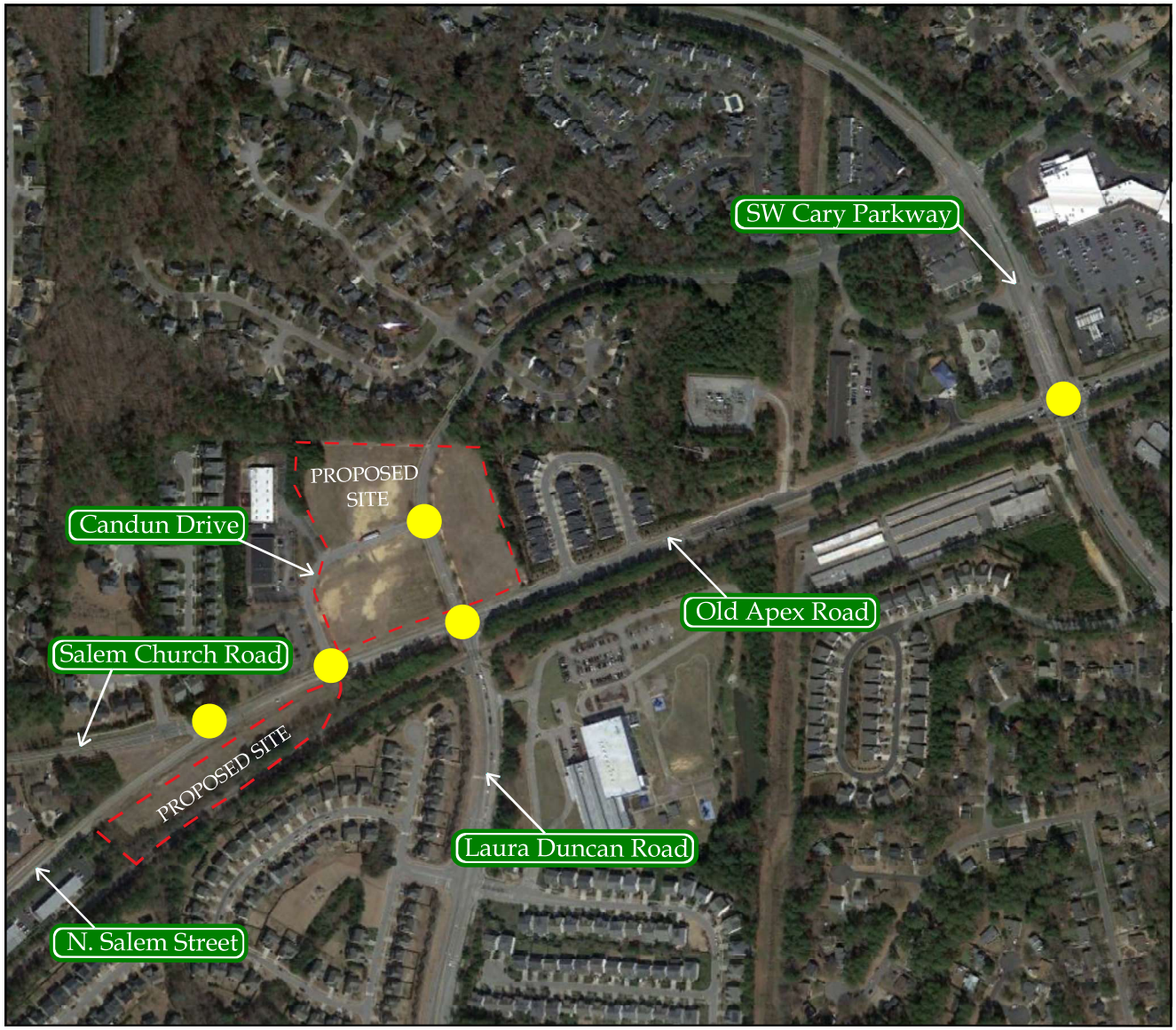
Report

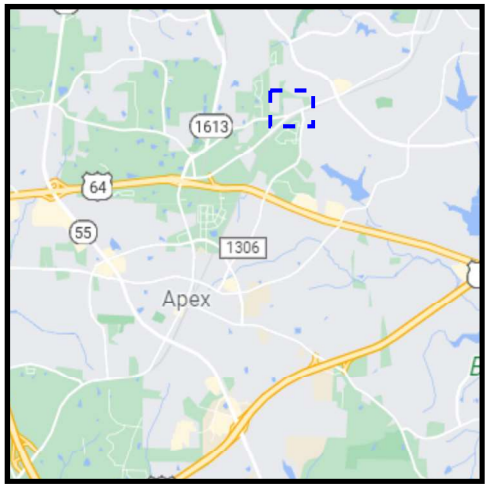
The Traffic Impact Analysis report will be prepared based on the Town and NCDOT guidelines. If you find this memorandum of understanding acceptable, please let me know so that we may include it in the TIA report. If you have any questions or concerns, please do not hesitate to contact me.

Sincerely,
Ramey Kemp & Associates, Inc.

Michael Karpinski, PE
NC Traffic Project Manager

Attachments: Site Location Map Figure
Site Plan
Existing Lane Configurations
2021 Existing Traffic Volumes Figure
Site Trip Distribution Figures
Count Information





LEGEND

- Proposed Site Location
- Study Intersection
- Study Area

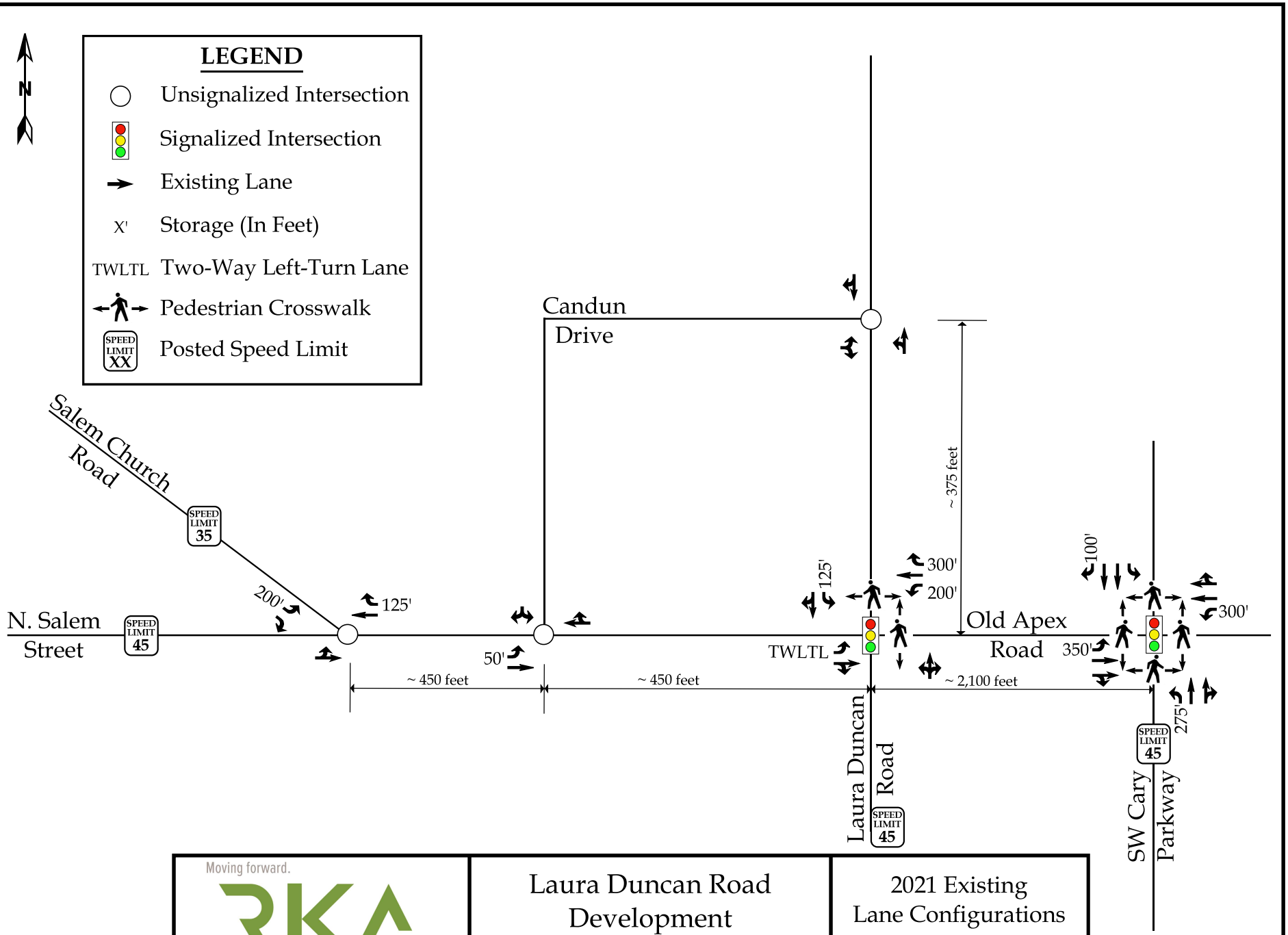
Moving forward.
RKA
RAMEY KEMP ASSOCIATES

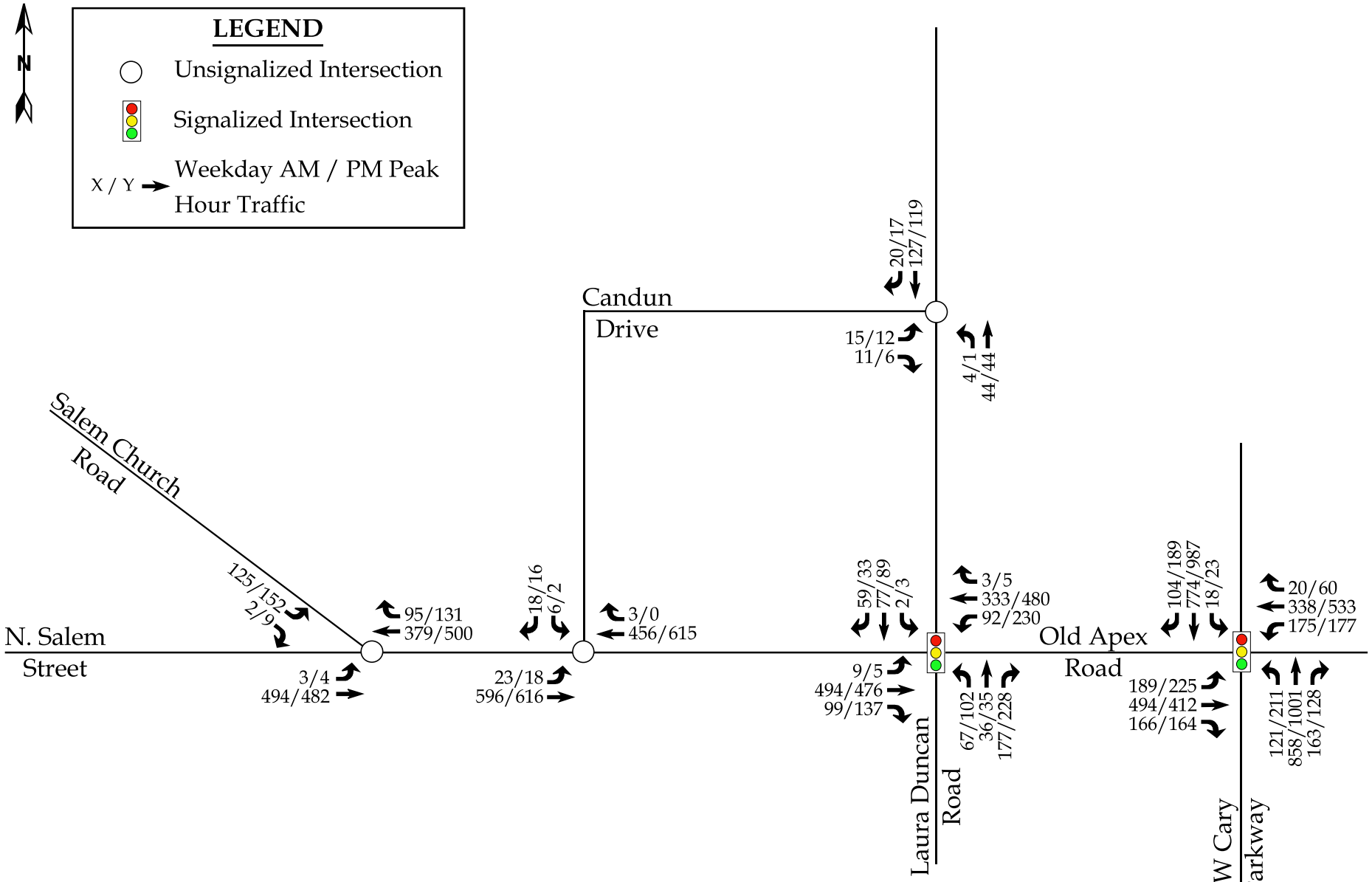
Laura Duncan Road Development
Apex, NC

Site Location Map

Scale: Not to Scale | Figure 1

N


LEGEND
Unsignalized Intersection
Signalized Intersection
Existing Lane
X' Storage (In Feet)
TWLTL Two-Way Left-Turn Lane
Pedestrian Crosswalk
SPEED LIMIT XX Posted Speed Limit
N
Candun Drive
Salem Church Road
SPEED LIMIT 35
200'
125'
N. Salem Street
SPEED LIMIT 45
50'
~ 450 feet
~ 450 feet
~ 375 feet
125'
300'
200'
TWLTL
Old Apex Road
~ 2,100 feet
100'
350'
300'
275'
Laura Duncan Road
SPEED LIMIT 45
SW Cary Parkway
SPEED LIMIT 45
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development Apex, NC
2021 Existing Lane Configurations
Scale: Not to Scale
Figure 3

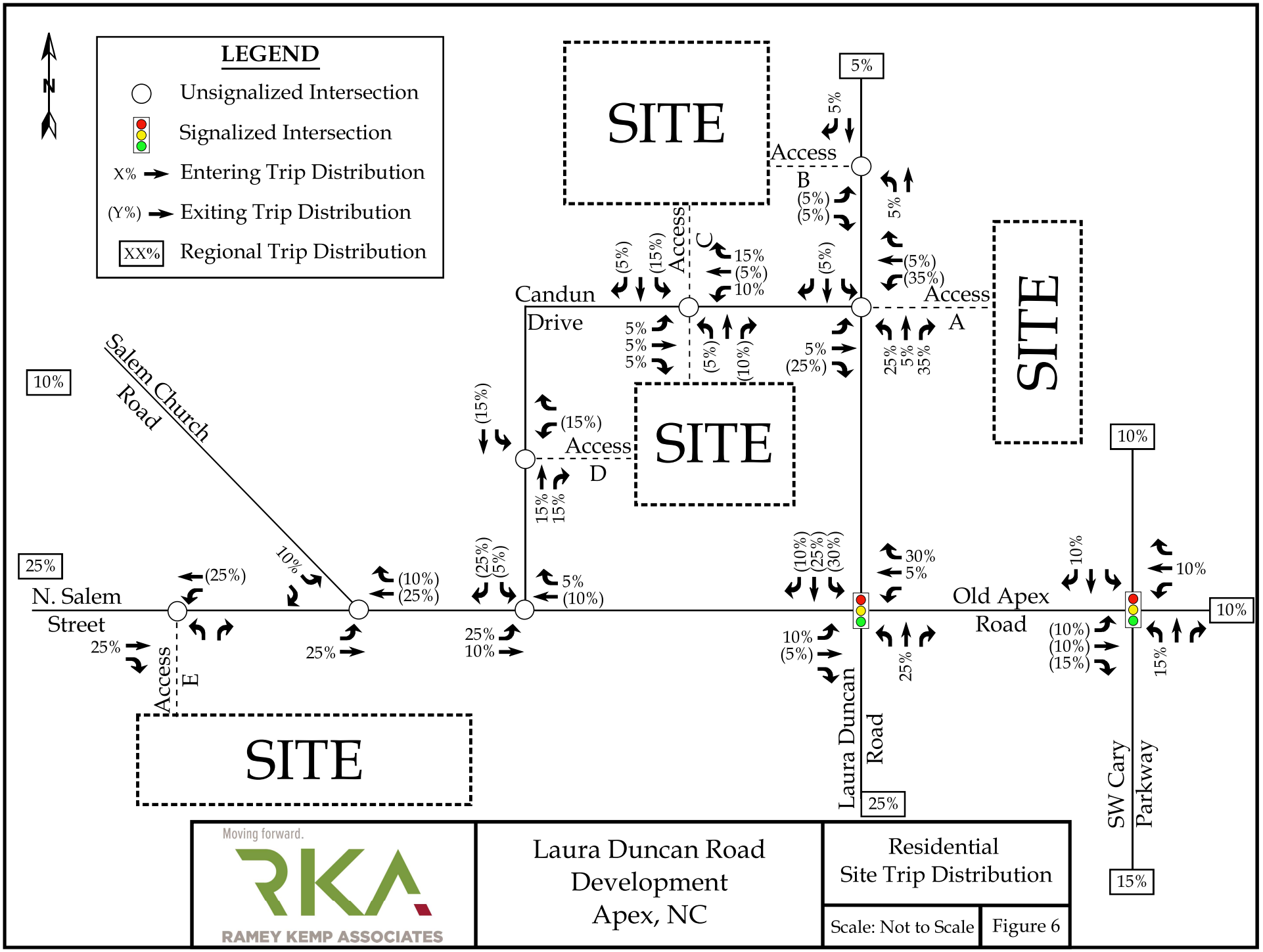


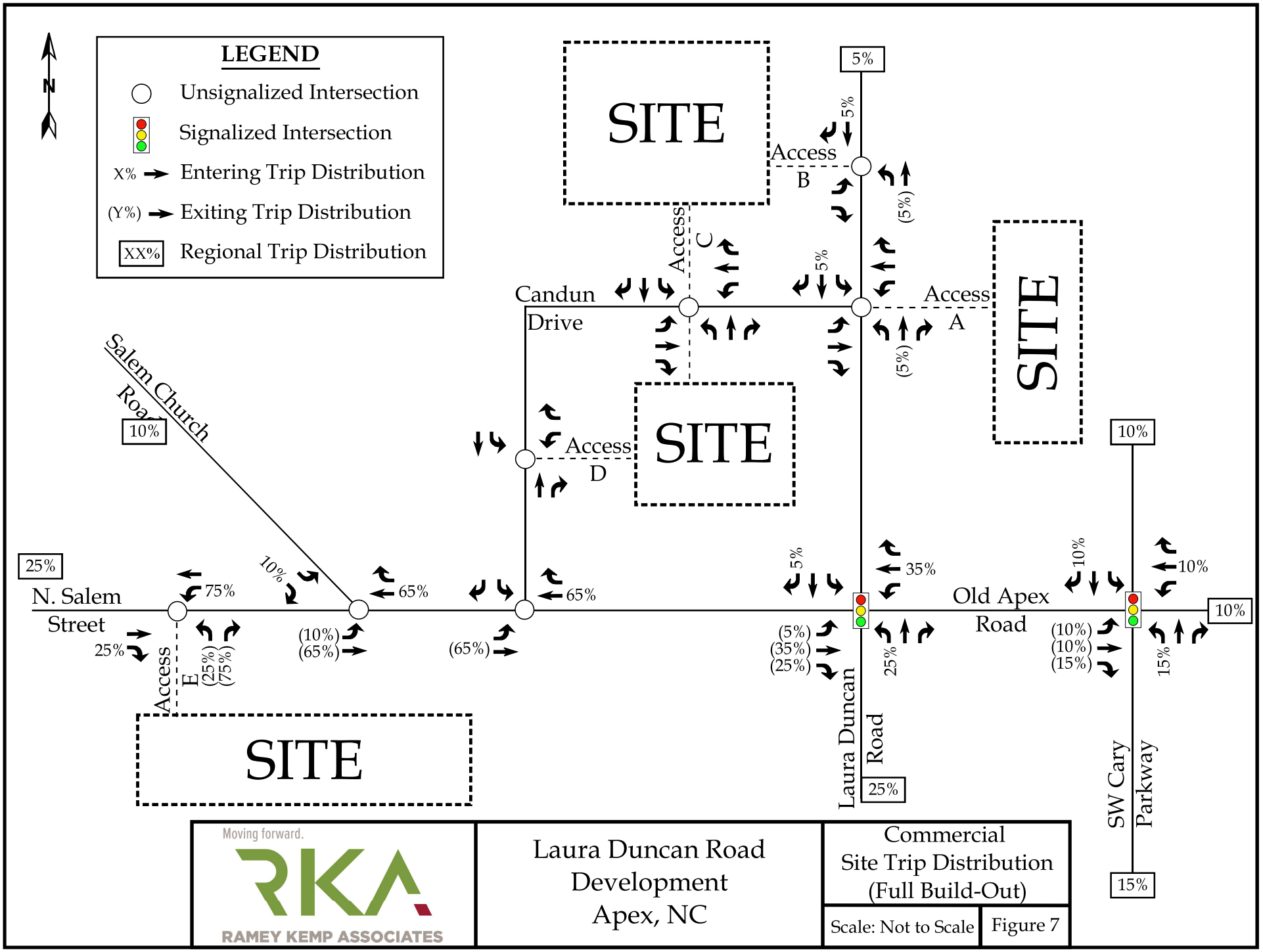
Moving forward. RKA RAMEY KEMP ASSOCIATES

Laura Duncan Road Development
Apex, NC

2021 Existing Peak Hour Traffic

Scale: Not to Scale | Figure 4


LEGEND
Unsignalized Intersection
Signalized Intersection
X% Entering Trip Distribution
(Y%) Exiting Trip Distribution
XX% Regional Trip Distribution
N
SITE
SITE
SITE
SITE
Access B
Access C
Access D
Access E
Access A
Candun Drive
Salem Church Road
N. Salem Street
Old Apex Road
Laura Duncan Road
SW Cary Parkway
5%
10%
25%
15%
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development
Apex, NC
Residential Site Trip Distribution
Scale: Not to Scale
Figure 6


LEGEND
Unsignalized Intersection
Signalized Intersection
X% Entering Trip Distribution
(Y%) Exiting Trip Distribution
XX% Regional Trip Distribution
N
SITE
SITE
SITE
SITE
5%
5%
Access B
(5%)
Access C
5%
Candun Drive
Access A
(5%)
Salem Church Road
10%
Access D
25%
N. Salem Street
75%
10%
65%
65%
65%
Access E
(25%)
(75%)
25%
(10%)
(65%)
(65%)
5%
35%
(5%)
(35%)
(25%)
25%
Old Apex Road
10%
10%
10%
(10%)
(10%)
(15%)
15%
10%
Laura Duncan Road
25%
SW Cary Parkway
15%
Moving forward.
RKA
RAMEY KEMP ASSOCIATES
Laura Duncan Road Development
Apex, NC
Commercial
Site Trip Distribution
(Full Build-Out)
Scale: Not to Scale
Figure 7

Michael Karpinski

From: Brennan, Sean P <spbrennan@ncdot.gov>
Sent: Monday, November 29, 2021 11:38 AM
To: Serge Grebenschikov; Michael Karpinski; Konda, Priyatham; Walker, Braden M; Russell Dalton
Subject: Re: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Follow Up Flag: Follow up
Flag Status: Completed

NCDOT is okay with it as well.

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

4009 District Drive (Physical Address)
Raleigh, NC 27607

1575 Mail Service Center (Mailing Address)
Raleigh, NC 27699-1575

From: Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>
Sent: Wednesday, November 24, 2021 3:33 PM
To: Michael Karpinski <MKarpinski@rameykemp.com>; Konda, Priyatham <priyatham.konda@townofcary.org>; Brennan, Sean P <spbrennan@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>
Subject: RE: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Thank you Michael.

This works from our end.

Happy Thanksgiving!

Serge Grebenschikov, PE
Traffic Engineer
Public Works & Transportation – Traffic
73 Hunter Street, 3rd Fl
PO Box 250
Apex, NC 27502
P: (919) 372-7448
E: Serge.Grebenschikov@apexnc.org

From: Michael Karpinski <MKarpinski@rameykemp.com>
Sent: Wednesday, November 24, 2021 3:15 PM
To: Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>; Priyatham Konda <Priyatham.Konda@townofcary.org>; Brennan, Sean P <spbrennan@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>
Cc: Fenner, Edwin F <effenner@ncdot.gov>; Neidringhaus, Amy N <anneidringhaus@ncdot.gov>; Anna Irby <airby@rameykemp.com>; Rob H. Myers <rob.myers@townofcary.org>; Luana Deans <Luana.Deans@townofcary.org>; David Spencer <David.Spencer@townofcary.org>; Erin Puckett <Erin.Puckett@townofcary.org>; Rob Wilson <Rob.Wilson@townofcary.org>
Subject: RE: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Hey Serge,

Please find the attached revised MOU for the Laura Duncan Road development TIA. The only minor modification since my email from Monday is the assumed square footage for the commercial parcel – the Client wanted to increase the square footage to 10,000 square feet per acre to provide some flexibility in the event they are able to have a slightly larger building footprint. The trip generation in the attached MOU has been updated to reflect this change.

Let me know if you have any questions/comments. Thanks and hope you have a great Thanksgiving weekend!

Michael

Michael Karpinski, PE
Traffic Engineering Project Manager
D 919 987 1300 | T 919 872 5115
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>
Sent: Monday, November 22, 2021 5:26 PM
To: Michael Karpinski <MKarpinski@rameykemp.com>; Priyatham Konda <Priyatham.Konda@townofcary.org>; Brennan, Sean P <spbrennan@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>
Cc: Fenner, Edwin F <effenner@ncdot.gov>; Neidringhaus, Amy N <anneidringhaus@ncdot.gov>; Anna Irby <airby@rameykemp.com>; Rob H. Myers <rob.myers@townofcary.org>; Luana Deans <Luana.Deans@townofcary.org>; David Spencer <David.Spencer@townofcary.org>; Erin Puckett <Erin.Puckett@townofcary.org>; Rob Wilson <Rob.Wilson@townofcary.org>
Subject: RE: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Hi Michael,

Thank you for the information. Apex is ok with the changes, Can you please provide us with an updated MOU document?

Kind regards

Serge Grebenschikov, PE
Traffic Engineer
Public Works & Transportation – Traffic
73 Hunter Street, 3rd Fl
PO Box 250
Apex, NC 27502
P: (919) 372-7448
E: Serge.Grebenschikov@apexnc.org

From: Michael Karpinski <MKarpinski@rameykemp.com>
Sent: Monday, November 22, 2021 5:18 PM
To: Priyatham Konda <Priyatham.Konda@townofcary.org>; Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>; Brennan, Sean P <spbrennan@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Russell Dalton <Russell.Dalton@apexnc.org>
Cc: Fenner, Edwin F <effenner@ncdot.gov>; Neidringhaus, Amy N <anneidringhaus@ncdot.gov>; Anna Irby <airby@rameykemp.com>; Rob H. Myers <rob.myers@townofcary.org>; Luana Deans <Luana.Deans@townofcary.org>; David Spencer <David.Spencer@townofcary.org>; Erin Puckett <Erin.Puckett@townofcary.org>; Rob Wilson <Rob.Wilson@townofcary.org>
Subject: RE: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Priyatham and all –

Thank you for a summary of the information below in regards to the intersection of Cary Parkway and Old Apex Road. Upon further discussion with our Client, we decided that it would be in the best interest of our project to include the intersection of Cary Parkway / Old Apex Road in the TIA based on the information below and feedback from citizens

in the surrounding area. That being said, I am following up with a summary of the changes to the approved MOU and methodology related to existing peak hour traffic volumes at the intersection of Cary Parkway / Old Apex Road:

- The number of apartment units for the residential portion of the site have been increased from 200 units to a maximum of 240 units. The final number of apartment units have not been determined at this time but we wanted to provide flexibility in the event there is the opportunity to add more units from the original 200 unit count.
- Working with the project team on the commercial portion of this project examining the setback requirements from N. Salem Street, the CSX Rail Line, a general review of these parcels, the commercial outparcel will realistically only have one (1) acre of developable land to be used as future flex space/retail space. The remaining ~1.5 acres will be dedicated as RCA or as ROW/land for the future roundabout at N. Salem Street / Salem Church Road per the Town's CTP; therefore, the trip generation associated with the commercial outparcel has been decreased from 20,320 sq. ft. to 8,000 sq. ft. of general retail space.
- The study area will now include the intersection of Old Apex Road and Cary Parkway
    - Traffic counts and signal timings from 21-TAR-460 will be utilized for our TIA. All COVID factor adjustment methodology from 21-TAR-460 will be utilized for the existing peak hour traffic volumes at this intersection:
        - Traffic counts were collected in August of 2021 while schools were not in session during the effects of the COVID-19 pandemic. Traffic counts from May of 2019 at this intersection were available from the Town of Cary which were collected when schools were in session. Based on a comparison of grown 2021 counts (May 2019 counts grown to 2021 using a 1% growth rate) and the August 2021 counts, adjustment factors of 1.25 and 1.33 were calculated and applied [to the August 2021 traffic counts] to determine the new weekday AM and PM peak hour traffic volumes, respectively.

The updated site location map, existing lane configurations figure, 2021 existing peak hour traffic volumes figure, and site trip distribution figures are all attached for reference. We will continue moving forward with the TIA per the above outlined methodology. Please let me know if you have any questions/concerns or need any additional information from us at this time.

Thanks!
Michael

Michael Karpinski, PE
Traffic Engineering Project Manager
D 919 987 1300 | T 919 872 5115
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Priyatham Konda <Priyatham.Konda@townofcary.org>
Sent: Monday, November 8, 2021 12:08 PM
To: Serge Grebenschikov <Serge.Grebenschikov@apexnc.org>; Brennan, Sean P <spbrennan@ncdot.gov>; Walker, Braden M <bmwalker1@ncdot.gov>; Michael Karpinski <MKarpinski@rameykemp.com>; Russell Dalton <Russell.Dalton@apexnc.org>
Cc: Fenner, Edwin F <effenner@ncdot.gov>; Neidringhaus, Amy N <anneidringhaus@ncdot.gov>; Anna Irby <airby@rameykemp.com>; Rob H. Myers <Rob.Myers@townofcary.org>; Luana Deans <Luana.Deans@townofcary.org>; David Spencer <David.Spencer@townofcary.org>; Erin Puckett <Erin.Puckett@townofcary.org>; Rob Wilson

<Rob.Wilson@townofcary.org>
Subject: RE: [External] RE: Laura Duncan Road / N. Salem Street Proposed Development - Apex, NC

Hope everyone had a good weekend! Thank you Russell, Serge, Amy and Sean for your responses. I appreciate each of your attention to our request and I am going to try to consolidate all of the separate threads into this one 😊

Thank you for providing your thought process in determining whether this intersection should be included in the scope. We agree that the intersection of Cary Pkwy and Old Apex Rd is mostly built out and constrained by the railroad ROW on the southside thereby severely limiting any turn lane or improvements at the intersection itself. We have a traffic study (21-TAR-460) that RKA recently completed for another rezoning currently under review with Congestion Management; this study was completed for a multifamily development across from the Garden Supply Co (about 0.75 miles east of Cary Pkwy). The intersection of Cary Pkwy and Old Apex Rd has been included in that TAR (Traffic Analysis Report). Based on that TAR, under the existing conditions the overall LOS is E in the PM peak (with EB and WB approaches failing). Below is a screenshot of the recommended improvements and LOS summary table from 21-TAR-460. As you can see "Option 1" may be challenging for any developer but "Option 2" could be explored. We feel the recommended turn lane extensions and/or other possibilities should be reevaluated with the proposed Laura Duncan Rd development also. RKA could use any or all data from 21-TAR-460 to help reduce the data collection efforts.

Given the proximity of the proposed development in Apex to this intersection, the development being a rezoning and the neighborhood concerns, we feel there is value in studying this intersection to understand any potential improvements (whether they are completed by private developments or others) and acknowledge the deficiencies in the study. So, we would like to request the intersection of Cary Parkway and Old Apex Rd be included in the TIA for the Laura Duncan Rd development.

Please let us know if you would like to discuss our request further.

Thank you all again for your time on this matter!
Priyatham

APPENDIX B

COUNT DATA

TRAFFIC DATA COLLECTION

File Name : Apex(Laura Duncan and Candun)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 1

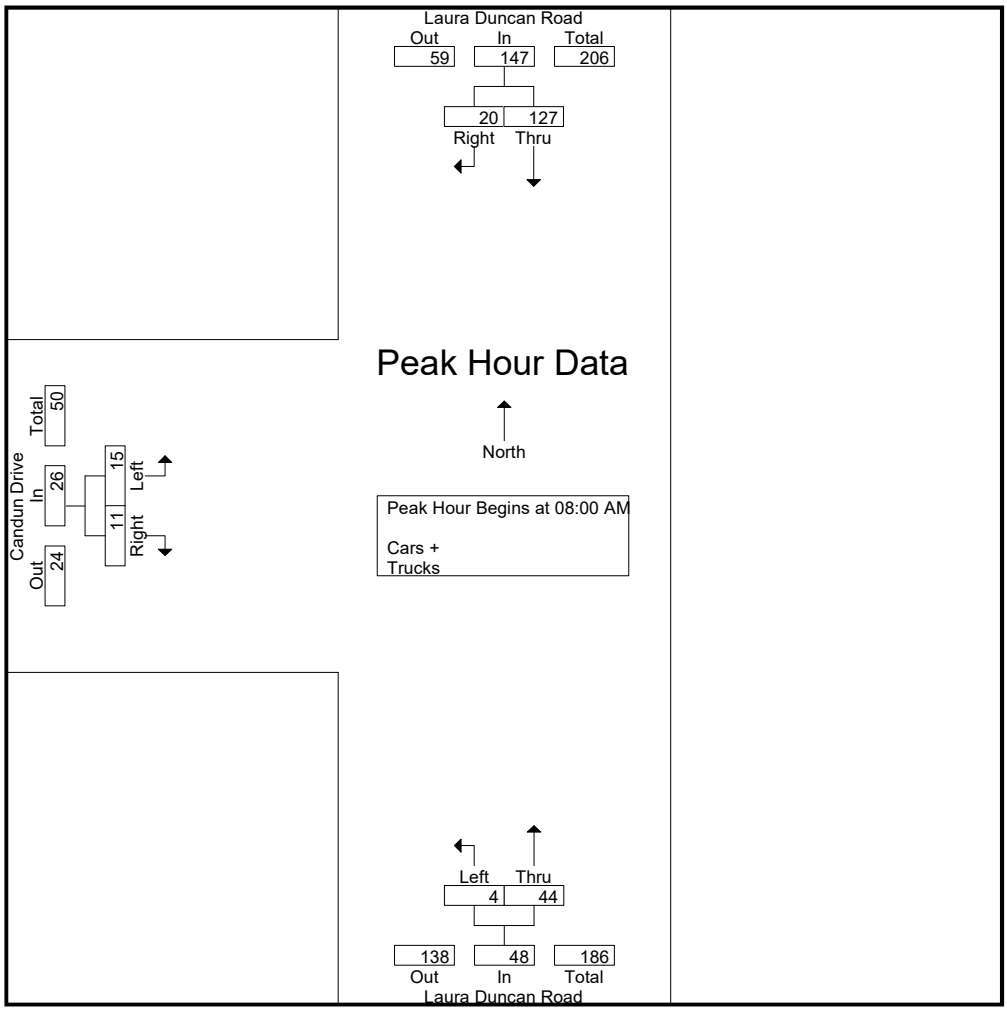
Groups Printed- Cars + - Trucks

	Laura Duncan Road Southbound			Laura Duncan Road Northbound			Candun Drive Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
07:00 AM	0	18	18	12	0	12	0	0	0	30
07:15 AM	0	18	18	7	2	9	0	2	2	29
07:30 AM	2	17	19	7	0	7	0	2	2	28
07:45 AM	2	29	31	15	0	15	0	3	3	49
Total	4	82	86	41	2	43	0	7	7	136
08:00 AM	4	23	27	11	3	14	2	4	6	47
08:15 AM	3	17	20	11	0	11	2	5	7	38
08:30 AM	7	41	48	10	1	11	4	4	8	67
08:45 AM	6	46	52	12	0	12	3	2	5	69
Total	20	127	147	44	4	48	11	15	26	221
Grand Total	24	209	233	85	6	91	11	22	33	357
Apprch %	10.3	89.7		93.4	6.6		33.3	66.7		
Total %	6.7	58.5	65.3	23.8	1.7	25.5	3.1	6.2	9.2	
Cars +	24	208	232	85	6	91	11	22	33	356
% Cars +	100	99.5	99.6	100	100	100	100	100	100	99.7
Trucks	0	1	1	0	0	0	0	0	0	1
% Trucks	0	0.5	0.4	0	0	0	0	0	0	0.3

TRAFFIC DATA COLLECTION

File Name : Apex(Laura Duncan and Candun)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 2

	Laura Duncan Road Southbound			Laura Duncan Road Northbound			Candun Drive Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	4	23	27	11	**3**	**14**	2	4	6	47
08:15 AM	3	17	20	11	0	11	2	**5**	7	38
08:30 AM	**7**	41	48	10	1	11	**4**	4	**8**	67
08:45 AM	6	**46**	**52**	**12**	0	12	3	2	5	**69**
Total Volume	20	127	147	44	4	48	11	15	26	221
% App. Total	13.6	86.4		91.7	8.3		42.3	57.7		
PHF	.714	.690	.707	.917	.333	.857	.688	.750	.813	.801



TRAFFIC DATA COLLECTION

File Name : Apex(Laura Duncan and Candun)PM Peak
Site Code :
Start Date : 9/29/2021
Page No : 1

Groups Printed- Cars + - Trucks

	Laura Duncan Road Southbound			Laura Duncan Road Northbound			Candun Drive Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
04:00 PM	2	31	33	16	0	16	1	2	3	52
04:15 PM	5	20	25	22	0	22	2	1	3	50
04:30 PM	1	24	25	18	0	18	1	5	6	49
04:45 PM	1	22	23	9	1	10	1	3	4	37
Total	9	97	106	65	1	66	5	11	16	188
05:00 PM	1	25	26	15	0	15	0	2	2	43
05:15 PM	4	29	33	10	0	10	1	2	3	46
05:30 PM	4	36	40	8	1	9	3	5	8	57
05:45 PM	1	29	30	11	0	11	2	3	5	46
Total	10	119	129	44	1	45	6	12	18	192
Grand Total	19	216	235	109	2	111	11	23	34	380
Apprch %	8.1	91.9		98.2	1.8		32.4	67.6		
Total %	5	56.8	61.8	28.7	0.5	29.2	2.9	6.1	8.9	
Cars +	19	216	235	109	2	111	11	23	34	380
% Cars +	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

TRAFFIC DATA COLLECTION

File Name : Apex(Laura Duncan and Candun)PM Peak
Site Code :
Start Date : 9/29/2021
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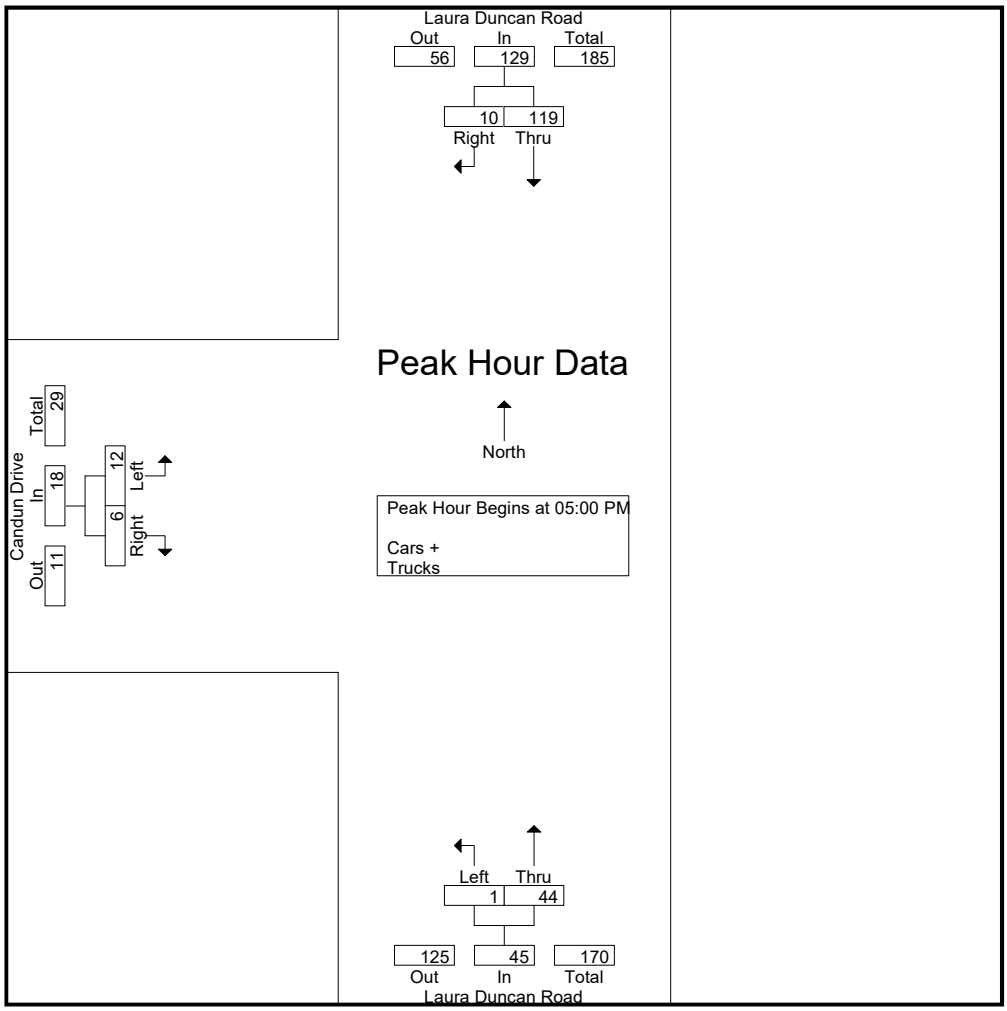
	Laura Duncan Road Southbound			Laura Duncan Road Northbound			Candun Drive Eastbound			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	1	25	26	**15**	0	**15**	0	2	2	43
05:15 PM	**4**	29	33	10	0	10	1	2	3	46
05:30 PM	4	**36**	**40**	8	**1**	9	**3**	**5**	**8**	**57**
05:45 PM	1	29	30	11	0	11	2	3	5	46
Total Volume	10	119	129	44	1	45	6	12	18	192
% App. Total	7.8	92.2		97.8	2.2		33.3	66.7		
PHF	.625	.826	.806	.733	.250	.750	.500	.600	.563	.842



TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Candun)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 1

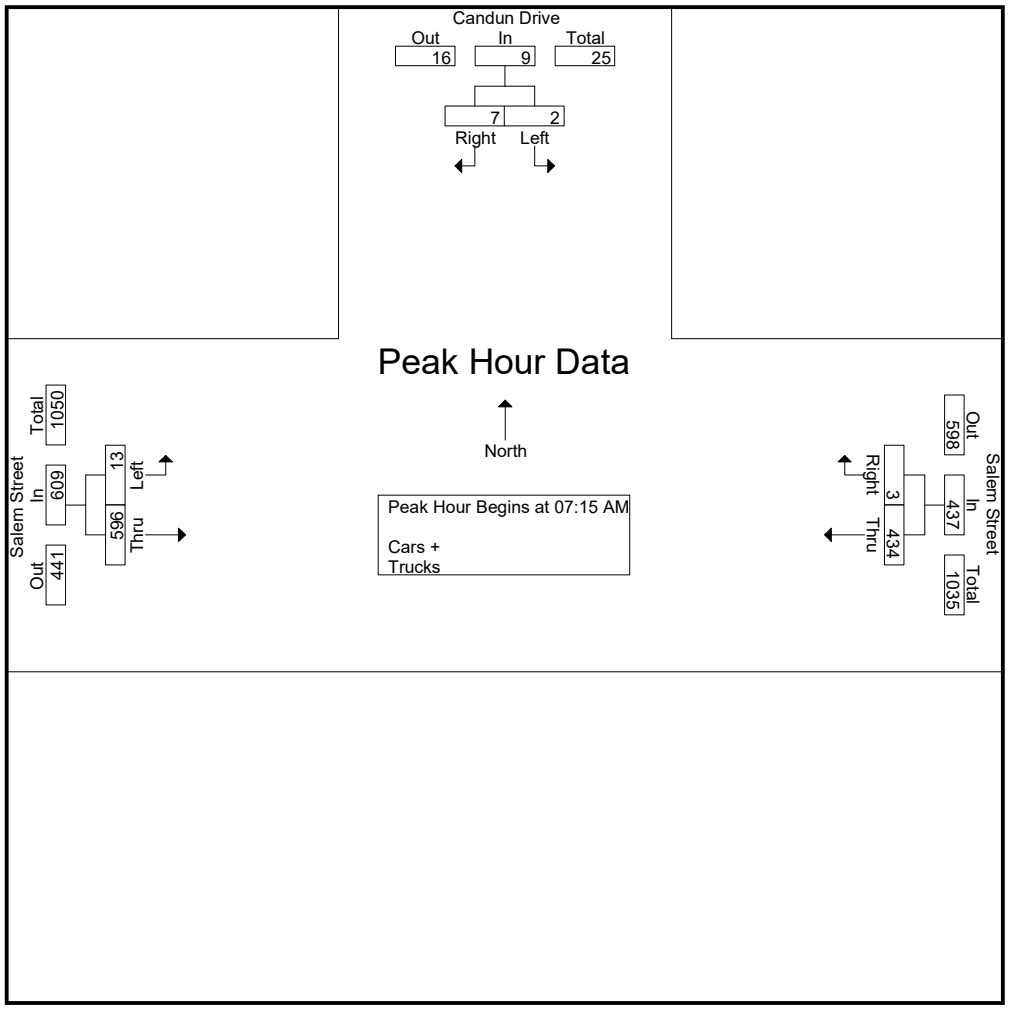
Groups Printed- Cars + - Trucks

	Candun Drive Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
07:00 AM	0	0	0	2	49	51	111	1	112	163
07:15 AM	1	0	1	0	84	84	134	5	139	224
07:30 AM	1	0	1	2	94	96	165	1	166	263
07:45 AM	2	0	2	1	154	155	152	3	155	312
Total	4	0	4	5	381	386	562	10	572	962
08:00 AM	3	2	5	0	102	102	145	4	149	256
08:15 AM	3	0	3	2	82	84	118	6	124	211
08:30 AM	5	1	6	1	94	95	115	4	119	220
08:45 AM	4	0	4	1	105	106	123	3	126	236
Total	15	3	18	4	383	387	501	17	518	923
Grand Total	19	3	22	9	764	773	1063	27	1090	1885
Apprch %	86.4	13.6		1.2	98.8		97.5	2.5		
Total %	1	0.2	1.2	0.5	40.5	41	56.4	1.4	57.8	
Cars +	19	3	22	9	764	773	1063	27	1090	1885
% Cars +	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Candun)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 2

	Candun Drive Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	1	0	1	0	84	84	134	**5**	139	224
07:30 AM	1	0	1	**2**	94	96	**165**	1	**166**	263
07:45 AM	2	0	2	1	**154**	**155**	152	3	155	**312**
08:00 AM	**3**	**2**	**5**	0	102	102	145	4	149	256
Total Volume	7	2	9	3	434	437	596	13	609	1055
% App. Total	77.8	22.2		0.7	99.3		97.9	2.1		
PHF	.583	.250	.450	.375	.705	.705	.903	.650	.917	.845



TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Candun)PM Peak
Site Code :
Start Date : 9/29/2021
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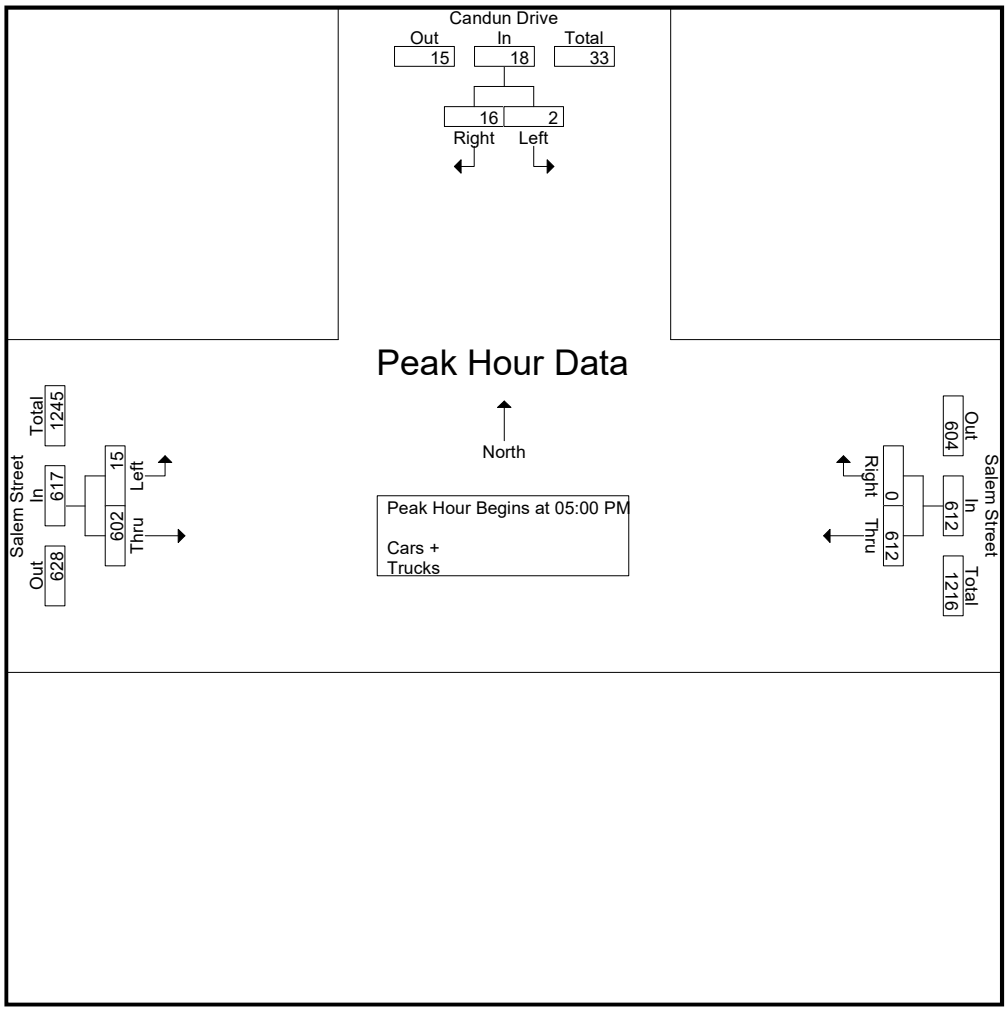
Groups Printed- Cars + - Trucks

	Candun Drive Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
04:00 PM	5	2	7	0	130	130	110	2	112	249
04:15 PM	5	0	5	0	156	156	102	4	106	267
04:30 PM	2	0	2	1	136	137	135	3	138	277
04:45 PM	2	2	4	0	138	138	122	3	125	267
Total	14	4	18	1	560	561	469	12	481	1060
05:00 PM	3	1	4	0	151	151	127	2	129	284
05:15 PM	6	0	6	0	155	155	175	1	176	337
05:30 PM	5	0	5	0	170	170	154	9	163	338
05:45 PM	2	1	3	0	136	136	146	3	149	288
Total	16	2	18	0	612	612	602	15	617	1247
Grand Total	30	6	36	1	1172	1173	1071	27	1098	2307
Apprch %	83.3	16.7		0.1	99.9		97.5	2.5		
Total %	1.3	0.3	1.6	0	50.8	50.8	46.4	1.2	47.6	
Cars +	30	6	36	1	1172	1173	1071	27	1098	2307
% Cars +	100	100	100	100	100	100	100	100	100	100
Trucks	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Candun)PM Peak
Site Code :
Start Date : 9/29/2021
Page No : 2

	Candun Drive Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	3	**1**	4	0	151	151	127	2	129	284
05:15 PM	**6**	0	**6**	0	155	155	**175**	1	**176**	337
05:30 PM	5	0	5	0	**170**	**170**	154	**9**	163	**338**
05:45 PM	2	1	3	0	136	136	146	3	149	288
Total Volume	16	2	18	0	612	612	602	15	617	1247
% App. Total	88.9	11.1		0	100		97.6	2.4		
PHF	.667	.500	.750	.000	.900	.900	.860	.417	.876	.922



File Name : Apex(Salem and Laura Duncan)AM Peak
Site Code :
Start Date : 9/29/2021
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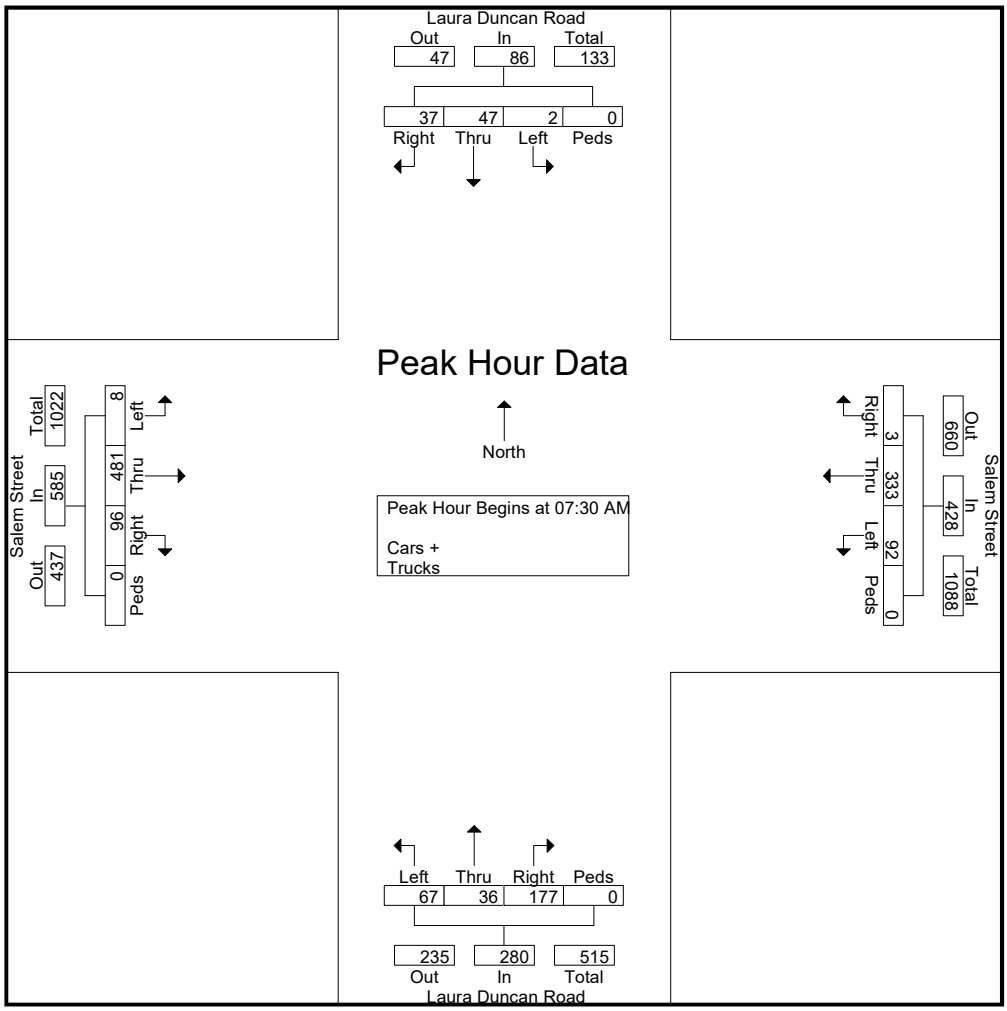
Groups Printed- Cars + - Trucks

	Laura Duncan Road Southbound					Salem Street Westbound					Laura Duncan Road Northbound					Salem Street Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	18	0	0	18	1	44	35	0	80	27	8	7	0	42	43	66	1	0	110	250
07:15 AM	9	10	0	0	19	0	60	29	0	89	37	8	15	0	60	30	102	1	0	133	301
07:30 AM	8	8	0	0	16	0	74	24	0	98	38	4	14	0	56	21	142	1	0	164	334
07:45 AM	17	13	1	0	31	3	114	24	0	141	44	9	24	0	77	26	122	2	0	150	399
Total	34	49	1	0	84	4	292	112	0	408	146	29	60	0	235	120	432	5	0	557	1284
08:00 AM	10	14	0	0	24	0	76	22	0	98	34	13	16	0	63	26	125	3	0	154	339
08:15 AM	2	12	1	0	15	0	69	22	0	91	61	10	13	0	84	23	92	2	0	117	307
08:30 AM	14	30	0	2	46	1	62	35	1	99	36	10	16	0	62	23	81	2	0	106	313
08:45 AM	9	36	2	3	50	1	67	29	25	122	59	14	30	0	103	27	90	1	0	118	393
Total	35	92	3	5	135	2	274	108	26	410	190	47	75	0	312	99	388	8	0	495	1352
Grand Total	69	141	4	5	219	6	566	220	26	818	336	76	135	0	547	219	820	13	0	1052	2636
Apprch %	31.5	64.4	1.8	2.3		0.7	69.2	26.9	3.2		61.4	13.9	24.7	0		20.8	77.9	1.2	0		
Total %	2.6	5.3	0.2	0.2	8.3	0.2	21.5	8.3	1	31	12.7	2.9	5.1	0	20.8	8.3	31.1	0.5	0	39.9	
Cars +	69	141	4	5	219	6	566	220	26	818	336	76	135	0	547	219	820	13	0	1052	2636
% Cars +	100	100	100	100	100	100	100	100	100	100	100	100	100	0	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Laura Duncan)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 2

	Laura Duncan Road Southbound					Salem Street Westbound					Laura Duncan Road Northbound					Salem Street Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	8	8	0	0	16	0	74	**24**	0	98	38	4	14	0	56	21	**142**	1	0	**164**	334
07:45 AM	**17**	13	**1**	0	**31**	**3**	**114**	24	0	**141**	44	9	**24**	0	77	**26**	122	2	0	150	**399**
08:00 AM	10	**14**	0	0	24	0	76	22	0	98	34	**13**	16	0	63	26	125	**3**	0	154	339
08:15 AM	2	12	1	0	15	0	69	22	0	91	**61**	10	13	0	**84**	23	92	2	0	117	307
Total Volume	37	47	2	0	86	3	333	92	0	428	177	36	67	0	280	96	481	8	0	585	1379
% App. Total	43	54.7	2.3	0		0.7	77.8	21.5	0		63.2	12.9	23.9	0		16.4	82.2	1.4	0		
PHF	.544	.839	.500	.000	.694	.250	.730	.958	.000	.759	.725	.692	.698	.000	.833	.923	.847	.667	.000	.892	.864



File Name : Apex(Salem and Laura Duncan)PM Peak
Site Code :
Start Date : 9/29/2021
Page No : 1

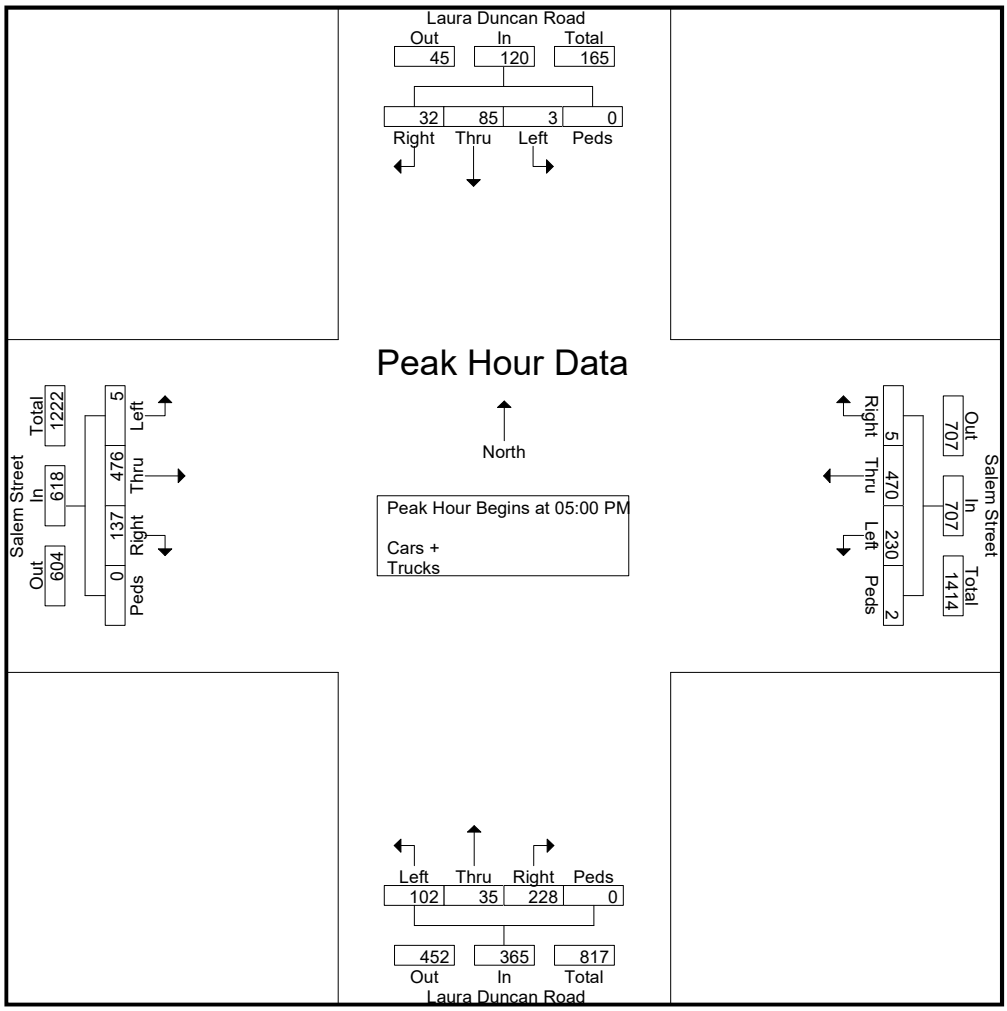
Groups Printed- Cars + - Trucks

	Laura Duncan Road Southbound					Salem Street Westbound					Laura Duncan Road Northbound					Salem Street Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
04:00 PM	2	26	2	1	31	0	79	51	1	131	70	14	41	0	125	26	73	4	0	103	390
04:15 PM	6	15	0	0	21	3	118	45	0	166	57	17	31	0	105	19	82	2	0	103	395
04:30 PM	3	19	3	0	25	3	106	41	0	150	50	16	27	0	93	26	108	2	0	136	404
04:45 PM	7	16	1	1	25	0	106	51	1	158	62	10	23	0	95	17	101	0	0	118	396
Total	18	76	6	2	102	6	409	188	2	605	239	57	122	0	418	88	364	8	0	460	1585
05:00 PM	9	15	0	0	24	3	114	47	2	166	55	10	27	0	92	20	102	2	0	124	406
05:15 PM	12	15	1	0	28	1	114	59	0	174	52	7	28	0	87	32	136	1	0	169	458
05:30 PM	7	28	1	0	36	1	133	71	0	205	54	6	24	0	84	39	134	2	0	175	500
05:45 PM	4	27	1	0	32	0	109	53	0	162	67	12	23	0	102	46	104	0	0	150	446
Total	32	85	3	0	120	5	470	230	2	707	228	35	102	0	365	137	476	5	0	618	1810
Grand Total	50	161	9	2	222	11	879	418	4	1312	467	92	224	0	783	225	840	13	0	1078	3395
Apprch %	22.5	72.5	4.1	0.9		0.8	67	31.9	0.3		59.6	11.7	28.6	0		20.9	77.9	1.2	0		
Total %	1.5	4.7	0.3	0.1	6.5	0.3	25.9	12.3	0.1	38.6	13.8	2.7	6.6	0	23.1	6.6	24.7	0.4	0	31.8	
Cars +	50	161	9	2	222	11	879	418	4	1312	467	92	224	0	783	225	840	13	0	1078	3395
% Cars +	100	100	100	100	100	100	100	100	100	100	100	100	100	0	100	100	100	100	0	100	100
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Laura Duncan)PM Peak
Site Code :
Start Date : 9/29/2021
Page No : 2

	Laura Duncan Road Southbound					Salem Street Westbound					Laura Duncan Road Northbound					Salem Street Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	9	15	0	0	24	**3**	114	47	**2**	166	55	10	27	0	92	20	102	**2**	0	124	406
05:15 PM	**12**	15	**1**	0	28	1	114	59	0	174	52	7	**28**	0	87	32	**136**	1	0	169	458
05:30 PM	7	**28**	1	0	**36**	1	**133**	**71**	0	**205**	54	6	24	0	84	39	134	2	0	**175**	**500**
05:45 PM	4	27	1	0	32	0	109	53	0	162	**67**	**12**	23	0	**102**	**46**	104	0	0	150	446
Total Volume	32	85	3	0	120	5	470	230	2	707	228	35	102	0	365	137	476	5	0	618	1810
% App. Total	26.7	70.8	2.5	0		0.7	66.5	32.5	0.3		62.5	9.6	27.9	0		22.2	77	0.8	0		
PHF	.667	.759	.750	.000	.833	.417	.883	.810	.250	.862	.851	.729	.911	.000	.895	.745	.875	.625	.000	.883	.905



TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Salem Church)AM Peak
Site Code :
Start Date : 9/29/2021
Page No : 1

Groups Printed- Cars + - Trucks

	Salem Church Road Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
07:00 AM	0	30	30	10	40	50	81	0	81	161
07:15 AM	0	28	28	15	74	89	111	0	111	228
07:30 AM	1	24	25	22	78	100	137	3	140	265
07:45 AM	1	31	32	26	117	143	121	0	121	296
Total	2	113	115	73	309	382	450	3	453	950
08:00 AM	0	39	39	28	92	120	112	0	112	271
08:15 AM	1	31	32	16	64	80	95	0	95	207
08:30 AM	1	19	20	21	70	91	110	1	111	222
08:45 AM	3	25	28	29	77	106	94	3	97	231
Total	5	114	119	94	303	397	411	4	415	931
Grand Total	7	227	234	167	612	779	861	7	868	1881
Apprch %	3	97		21.4	78.6		99.2	0.8		
Total %	0.4	12.1	12.4	8.9	32.5	41.4	45.8	0.4	46.1	
Cars +	7	227	234	166	610	776	856	7	863	1873
% Cars +	100	100	100	99.4	99.7	99.6	99.4	100	99.4	99.6
Trucks	0	0	0	1	2	3	5	0	5	8
% Trucks	0	0	0	0.6	0.3	0.4	0.6	0	0.6	0.4

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Salem Church)AM Peak
Site Code :
Start Date : 9/29/2021
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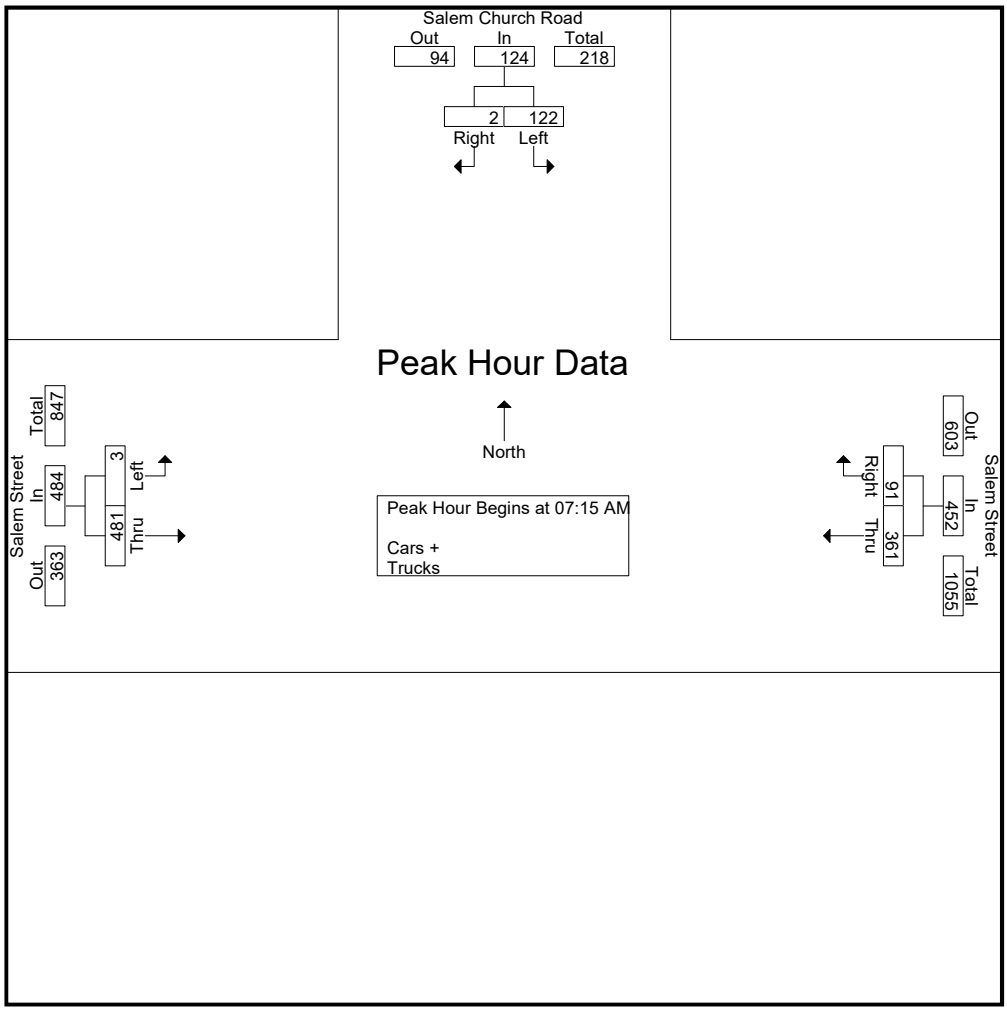
	Salem Church Road Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	0	28	28	15	74	89	111	0	111	228
07:30 AM	**1**	24	25	22	78	100	**137**	**3**	**140**	265
07:45 AM	1	31	32	26	**117**	**143**	121	0	121	**296**
08:00 AM	0	**39**	**39**	**28**	92	120	112	0	112	271
Total Volume	2	122	124	91	361	452	481	3	484	1060
% App. Total	1.6	98.4		20.1	79.9		99.4	0.6		
PHF	.500	.782	.795	.813	.771	.790	.878	.250	.864	.895



TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Salem Church)PM Peak
Site Code :
Start Date : 9/29/2021
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Groups Printed- Cars + - Trucks

	Salem Church Road Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
04:00 PM	2	32	34	38	103	141	83	2	85	260
04:15 PM	1	20	21	35	135	170	79	1	80	271
04:30 PM	2	17	19	31	116	147	123	5	128	294
04:45 PM	1	30	31	41	108	149	92	0	92	272
Total	6	99	105	145	462	607	377	8	385	1097
05:00 PM	4	34	38	30	128	158	91	2	93	289
05:15 PM	2	39	41	32	134	166	136	1	137	344
05:30 PM	2	42	44	36	132	168	122	1	123	335
05:45 PM	1	37	38	33	106	139	116	0	116	293
Total	9	152	161	131	500	631	465	4	469	1261
Grand Total	15	251	266	276	962	1238	842	12	854	2358
Apprch %	5.6	94.4		22.3	77.7		98.6	1.4		
Total %	0.6	10.6	11.3	11.7	40.8	52.5	35.7	0.5	36.2	
Cars +	15	251	266	276	959	1235	839	12	851	2352
% Cars +	100	100	100	100	99.7	99.8	99.6	100	99.6	99.7
Trucks	0	0	0	0	3	3	3	0	3	6
% Trucks	0	0	0	0	0.3	0.2	0.4	0	0.4	0.3

TRAFFIC DATA COLLECTION

File Name : Apex(Salem and Salem Church)PM Peak
Site Code :
Start Date : 9/29/2021
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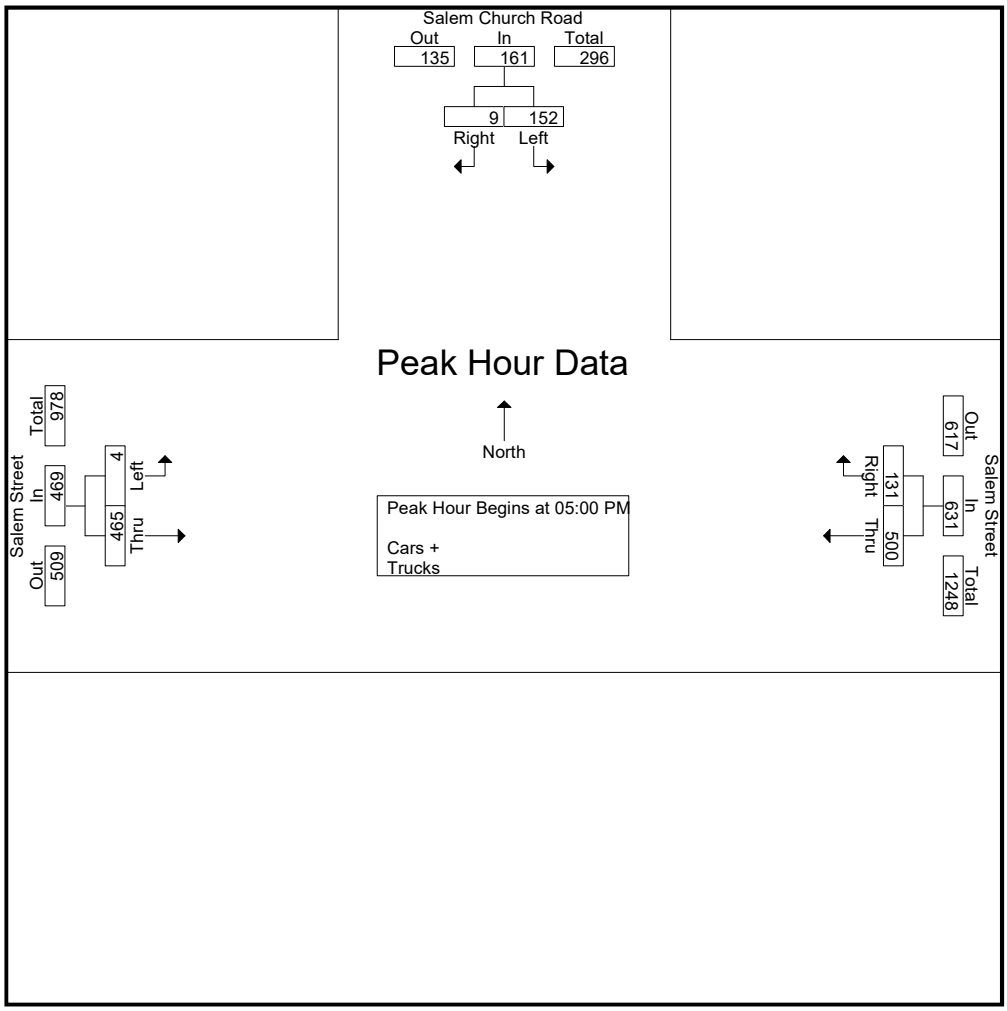
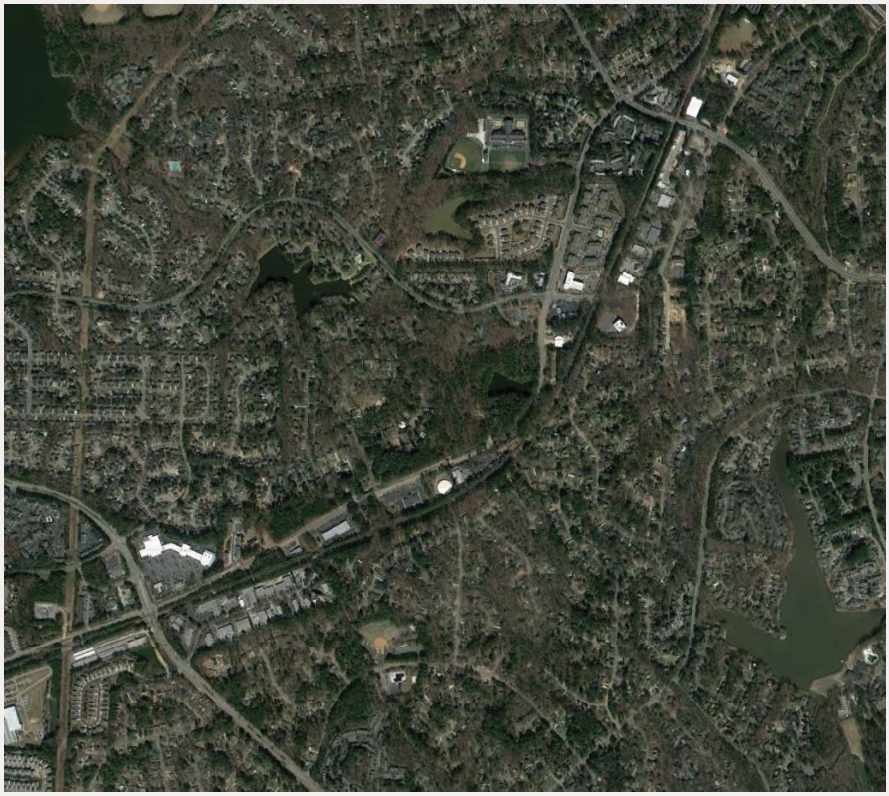
	Salem Church Road Southbound			Salem Street Westbound			Salem Street Eastbound			
Start Time	Right	Left	App. Total	Right	Thru	App. Total	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 05:00 PM										
05:00 PM	**4**	34	38	30	128	158	91	**2**	93	289
05:15 PM	2	39	41	32	**134**	166	**136**	1	**137**	**344**
05:30 PM	2	**42**	**44**	**36**	132	**168**	122	1	123	335
05:45 PM	1	37	38	33	106	139	116	0	116	293
Total Volume	9	152	161	131	500	631	465	4	469	1261
% App. Total	5.6	94.4		20.8	79.2		99.1	0.9		
PHF	.563	.905	.915	.910	.933	.939	.855	.500	.856	.916



RAMEY KEMP ASSOCIATES
Moving forward.



1412 Old Apex Road Residential (21 - TAR - 460) Final Draft

Traffic Impact Analysis

Cary, North Carolina

RKA

rameykemp.com

Transportation
Consulting
that moves us
forward.

TRAFFIC ANALYSIS REPORT

FOR

1412 OLD APEX ROAD MULTIFAMILY (21-TAR-460)

LOCATED

IN

CARY, NORTH CAROLINA

Prepared For:
Town of Cary
316 N. Academy Street
Cary, NC 27512

Prepared By:
Ramey Kemp & Associates, Inc.
5808 Faringdon Place, Suite 100
Raleigh, NC 27609
License #C-0910

October 2021

RKA Project No. 21486

Prepared By: MLS

Reviewed By: JTR

2. 2021 EXISTING PEAK HOUR CONDITIONS

2.1. 2021 Existing Peak Hour Traffic Volumes

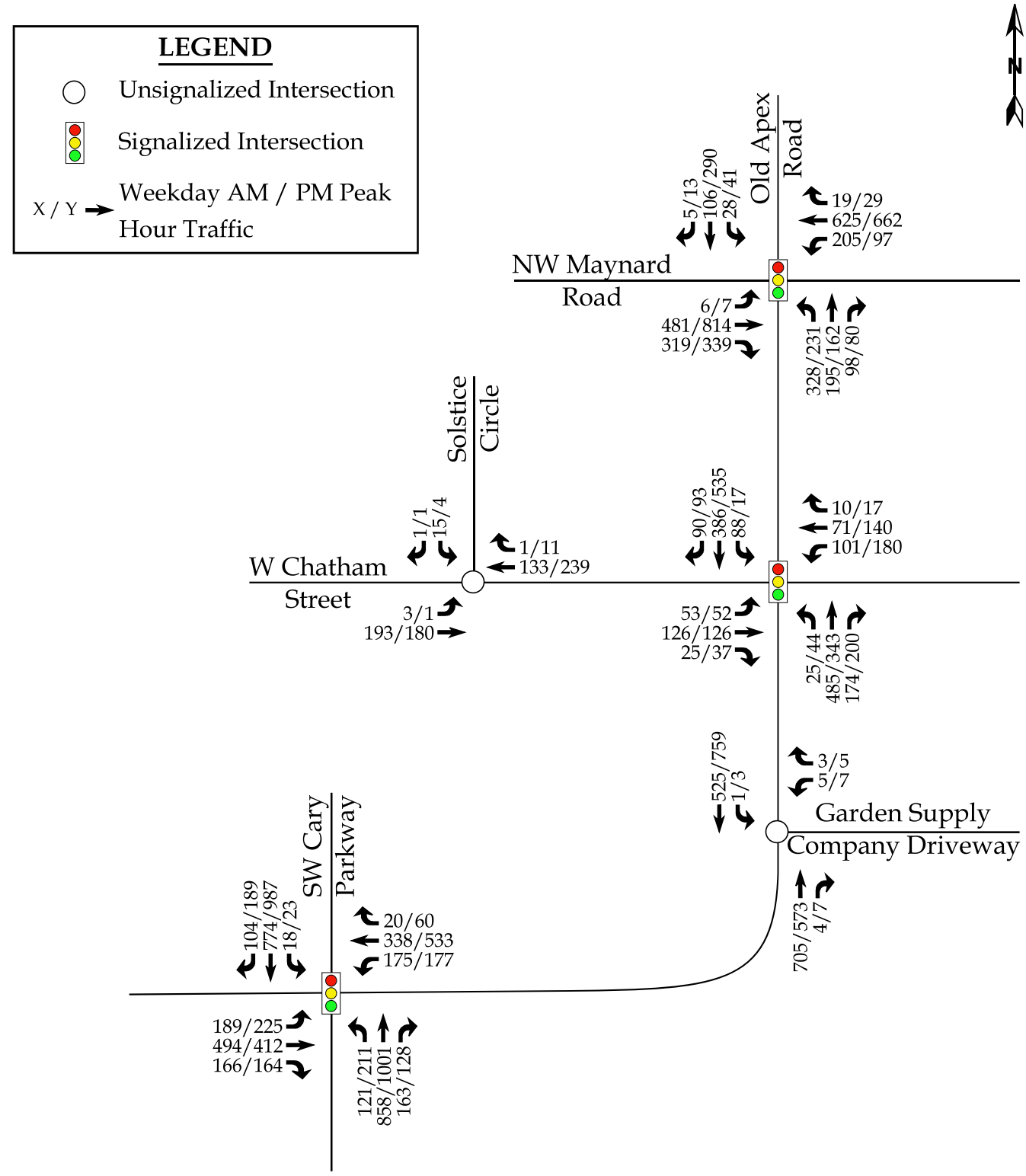
Existing peak hour traffic volumes were determined based on traffic counts conducted at the study intersections listed below, in August of 2021 by Burns Service, Inc. during a typical weekday AM (7:00 AM – 9:00 AM) and PM (4:00 PM – 6:00 PM) peak periods, while schools were not in session:

- Old Apex Road and NW Maynard Road
- Old Apex Road and W Chatham Street
- Old Apex Road and Garden Supply Company Driveway
- Old Apex Road and SW Cary Parkway
- W Chatham Street and Solstice Circle

It should be noted that this data was collected prior to schools being in session and during the effects of the COVID-19 pandemic. Count data at the intersection of SW Cary Parkway and Old Apex Road was available via the Town of Cary Traffic Count Database from May of 2019, while schools were in session.

An adjustment factor to apply to the 2021 data was determined based on changes in traffic patterns at the study intersection of SW Cary Parkway and Old Apex Road between May of 2019 (prior to the effect of COVID-19 pandemic) and August of 2021. Based on a comparison of grown 2021 counts (grown from 2019 to 2021 using a 1% annually compounded growth rate) and new 2021 counts, an adjustment factor of 1.25 was applied to the new weekday AM counts and a factor of 1.33 was applied to the new weekday PM counts.

Imbalances between study intersections were determined to be reasonable based on development driveways between study intersections. Refer to Figure 4 for 2021 existing weekday AM and PM peak hour traffic volumes. A copy of the count data is located in Appendix B of this report.



Moving forward.
RKA
RAMEY KEMP ASSOCIATES

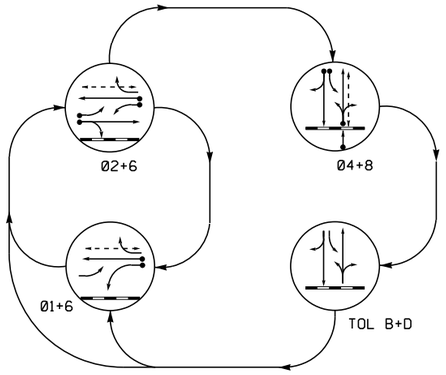
Old Apex Road Multifamily (21-TAR-460) Cary, NC	2021 Existing Peak Hour Traffic	
	Scale: Not to Scale	Figure 4

APPENDIX C

SIGNAL INFORMATION

PROJECT REFERENCE NO.	SHEET NO.
05-1487	Sig. 26.0

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

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

RAIL PREEMPT PHASES

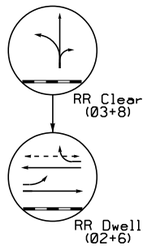


TABLE OF OPERATION

SIGNAL FACE	PHASE Ø1+6	Ø2+6	Ø4+8	TOL B+D	CLRRR	DWELL	FLASH
11	←-	~~F Y~~	~~R~~	~~R~~	~~R~~	~~R~~	~~Y~~
21, 22	R	G	R	R	R	G	Y
23	~~F Y~~	~~F Y~~	~~R~~	~~R~~	~~R~~	~~F Y~~	~~Y~~
41, 42	R	R	G	G	R	R	R
43, 44	R	R	G	R	R	R	R
61, 62	G	G	R	R	R	G	Y
81	R	R	G	G	G ←	R	R
82	R	R	G	G	G	R	R
P61, P62	W	W	DW	DW	DW	W	DRK
P81, P82	DW	DW	W	W	DW	DW	DRK
SIGN B	OFF	OFF	OFF	OFF	ON	ON	✱

✱ SEE NOTE 8

W - Walk
DW - Don't Walk
DRK - Dark

LOOP & DETECTOR INSTALLATION CHART

ASC/3-2070LN2 CONTROLLER w/ TS-2 CABINET

INDUCTIVE LOOPS						DETECTOR UNITS					
LOOP NO.	SIZE (ft)	DIST. FROM STOPBAR (ft)	TURNS	NEW	EXISTING	NEMA PHASE	NEW	EXISTING	TIMING FEATURE	TIMING TIME	DET TYPE
1A	6X40	0	2-4-2	-	X	1	-	X	DELAY	15	S
						6	-	X	DELAY	3	G
2A	6X6	300	EXIST	-	X	2	-	X	-	-	S
2B	6X40	0	2-4-2	-	X	2	-	X	DELAY	3	G
4A	6X40	0	2-4-2	-	X	4	-	X	DELAY	3	S
4B	6X40	0	2-4-2	-	X	4	-	X	DELAY	10	S
6A	6X6	300	EXIST	-	X	6	-	X	-	-	S
8A	6X40	0	2-4-2	-	X	8	-	X	DELAY	10	S
8B	6X6	0	EXIST	-	X	8	-	X	DELAY	15	S
8C	6X25	+40#	2-4-2	-	X	8	-	X	DELAY	5	S
8D	6X40	0#	2-4-2	-	X	8	-	X	DELAY	5	S

Located at RR Stopbar for advance signal heads

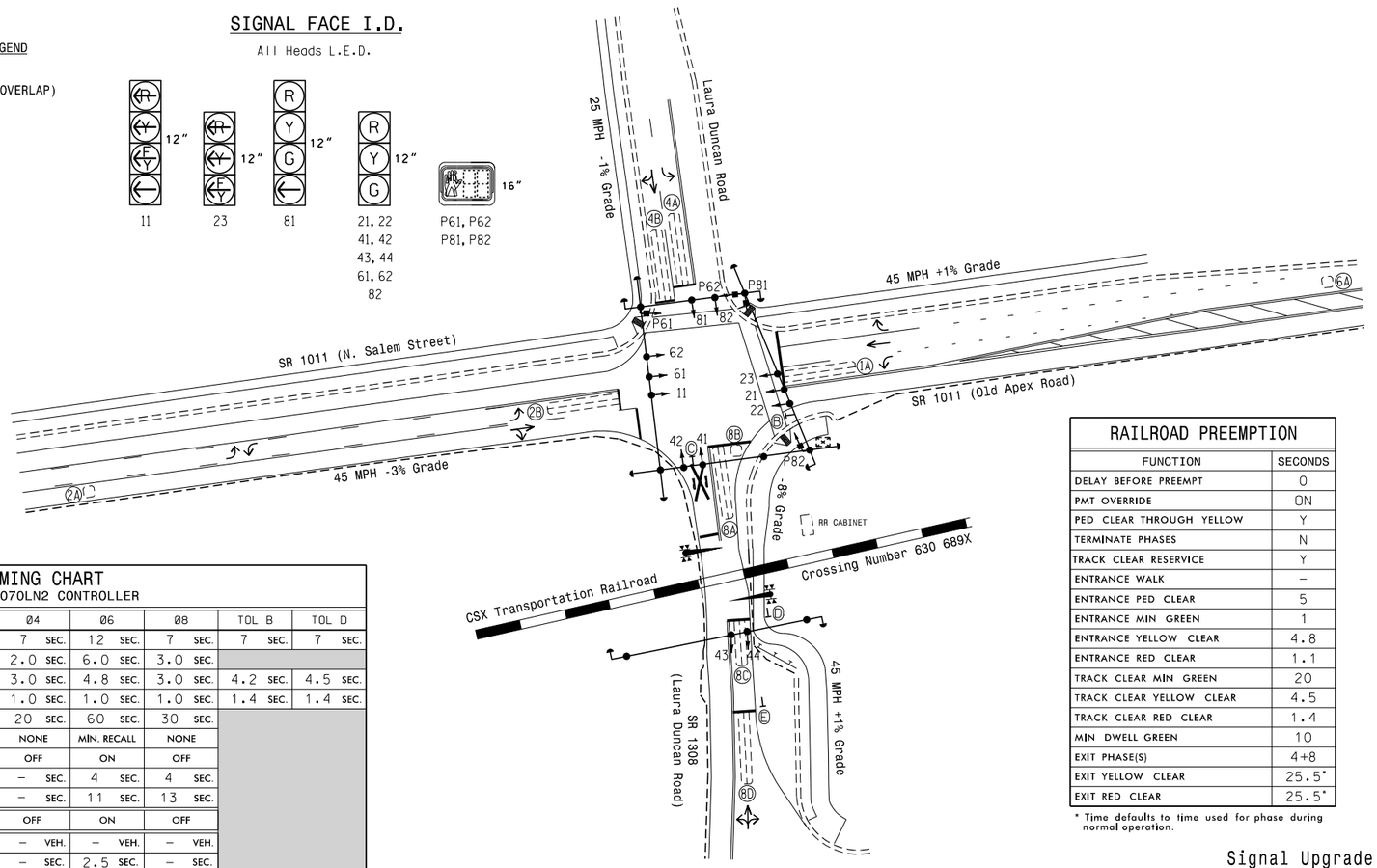
3 Phase
Fully Actuated
w/ Railroad Preemption
(Cary Signal System)

NOTES

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
2. This location contains railroad preemption phasing. Do not program signal for late night flashing operation.
3. Phase 1 may be lagged.
4. Set all detector units to presence mode.
5. Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
6. Program pedestrian heads to countdown the the flashing "Don't Walk" time only
7. Pavement markings are existing.
8. Ensure flashing operation does not alter operation of blankout signs.
9. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
10. Install new ASC/3 software in existing Controller.

SIGNAL FACE I.D.

All Heads L.E.D.



TIMING CHART

ASC/3-2070LN2 CONTROLLER

PHASE	Ø1	Ø2	Ø4	Ø6	Ø8	TOL B	TOL D
MINIMUM GREEN *	7 SEC.	12 SEC.	7 SEC.	12 SEC.	7 SEC.	7 SEC.	7 SEC.
VEHICLE EXT. *	2.0 SEC.	6.0 SEC.	2.0 SEC.	6.0 SEC.	3.0 SEC.		
YELLOW CHANGE INT.	3.0 SEC.	4.8 SEC.	3.0 SEC.	4.8 SEC.	3.0 SEC.	4.2 SEC.	4.5 SEC.
RED CLEARANCE	1.8 SEC.	1.0 SEC.	1.0 SEC.	1.0 SEC.	1.0 SEC.	1.4 SEC.	1.4 SEC.
MAX. 1 *	25 SEC.	60 SEC.	20 SEC.	60 SEC.	30 SEC.		
RECALL POSITION	NONE	MIN. RECALL	NONE	MIN. RECALL	NONE		
LOCK DET.	OFF	ON	OFF	ON	OFF		
WALK *	– SEC.	– SEC.	– SEC.	4 SEC.	4 SEC.		
PED. CLEAR	– SEC.	– SEC.	– SEC.	11 SEC.	13 SEC.		
VOLUME DENSITY	OFF	ON	OFF	ON	OFF		
ACTUATION B4 ADD *	– VEH.	– VEH.	– VEH.	– VEH.	– VEH.		
SEC. PER ACTUATION *	– SEC.	2.5 SEC.	– SEC.	2.5 SEC.	– SEC.		
MAX. INITIAL *	– SEC.	34 SEC.	– SEC.	34 SEC.	– SEC.		
TIME B4 REDUCTION *	– SEC.	15 SEC.	– SEC.	15 SEC.	– SEC.		
TIME TO REDUCE *	– SEC.	30 SEC.	– SEC.	30 SEC.	– SEC.		
MINIMUM GAP	– SEC.	3.2 SEC.	– SEC.	3.2 SEC.	– SEC.		
DUAL ENTRY	OFF	OFF	ON	OFF	ON		
SIMULTANEOUS GAP	ON	ON	ON	ON	ON		

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

RAILROAD PREEMPTION

FUNCTION	SECONDS
DELAY BEFORE PREEMPT	0
PMT OVERRIDE	ON
PED CLEAR THROUGH YELLOW	Y
TERMINATE PHASES	N
TRACK CLEAR RESERVICE	Y
ENTRANCE WALK	–
ENTRANCE PED CLEAR	5
ENTRANCE MIN GREEN	1
ENTRANCE YELLOW CLEAR	4.8
ENTRANCE RED CLEAR	1.1
TRACK CLEAR MIN GREEN	20
TRACK CLEAR YELLOW CLEAR	4.5
TRACK CLEAR RED CLEAR	1.4
MIN DWELL GREEN	10
EXIT PHASE(S)	4+8
EXIT YELLOW CLEAR	25.5*
EXIT RED CLEAR	25.5*

* Time defaults to time used for phase during normal operation.

This signal was designed for advanced preemption.

LEGEND

PROPOSED		EXISTING
○→	Traffic Signal Head	●→
◐→	Modified Signal Head	N/A
⊣	Sign	⊣
	Pedestrian Signal Head With Push Button & Sign	
○⤵	Signal Pole with Guy	●⤵
○⤵	Signal Pole with Sidewalk Guy	●⤵
▭	Inductive Loop Detector	▭
⊠	Controller & Cabinet	⊠
□	Junction Box	■
- - - - - -	2-in Underground Conduit	- - - - - -
N/A	Right of Way with Marker	△
→	Directional Arrow	→
N/A	Railroad Gate and Flasher	
N/A	Railroad Tracks	
N/A	Guardrail	
Ⓑ	"NO RIGHT TURN - TRAIN" L.E.D. Blankout Sign	Ⓑ
Ⓒ	"ONCOMING TRAFFIC MAY HAVE EXTENDED GREEN" Sign (W25-2)	Ⓒ
Ⓓ	"DO NOT STOP ON TRACKS" Sign (R8-8)	Ⓓ
Ⓔ	"STOP HERE ON RED" Sign (R10-6)	Ⓔ

Signal Upgrade

Prepared in the Offices of:
Transportation Mobility and Safety Division
Traffic Engineering Branch
NC DEPARTMENT OF TRANSPORTATION
Signal Design Section
750 N.Greenfield Pkwy.Garner,NC 27529

SR 1011 (North Salem Street/ Old Apex Road)
at
SR 1308 (Laura Duncan Road)

Division 5 Wake County Apex

PLAN DATE: April 2015 REVIEWED BY:
PREPARED BY: R.N. Zinser REVIEWED BY:

SCALE 0 40 1"=40'

REVISIONS	INIT.	DATE

SEAL
NORTH CAROLINA PROFESSIONAL SEAL 036833 ENGINEER RYAN W. HOUGH
Digitally signed by Ryan W. Hough 5/26/2015
DATE

SIG. INVENTORY NO. 05-1487

26-MAY-2015 07:09
S:\MTS\SIGNALS\TS Signals\Signal Design Section\Central Region\Div 5\Cary System Upgrade\05-1487\051487_sig_dsn_2015mmdd.dgn
rwhough

Morgan Rosamond

From: Michael Karpinski
Sent: Tuesday, October 5, 2021 4:26 PM
To: Morgan Rosamond
Subject: FW: Signal Timings Request - North Salem Street / Laura Duncan Road
Attachments: 051487-20150526g.pdf

Michael Karpinski, PE
Traffic Engineering Project Manager
D 919 987 1300 | T 919 872 5115
RAMEY KEMP ASSOCIATES
TOGETHER WE ARE LIMITLESS

From: Tom Reilly <Tom.Reilly@townofcary.org>
Sent: Tuesday, October 5, 2021 2:27 PM
To: Michael Karpinski <MKarpinski@rameykemp.com>; David Spencer <David.Spencer@townofcary.org>
Cc: Chris Little <Chris.Little@townofcary.org>; Anna Irby <airby@rameykemp.com>
Subject: RE: Signal Timings Request - North Salem Street / Laura Duncan Road

Michael,

Sorry for the delay. In the AM we are in free run operation with a MAX 2 time of 65 seconds on phase 8. The PM coordination plans are:

Offset 105 01-40sec 02-55sec 04-60sec 06-100sec 08-60sec

If you need additional information, please let me know.

Thanks,

Tom Reilly
Traffic Signal System Specialist
Cary - Transportation Department
(919)469-4203

From: Michael Karpinski <MKarpinski@rameykemp.com>
Sent: Tuesday, October 5, 2021 1:37 PM
To: David Spencer <David.Spencer@townofcary.org>; Tom Reilly <Tom.Reilly@townofcary.org>

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS

N. Salem Street/Old Apex Road

&

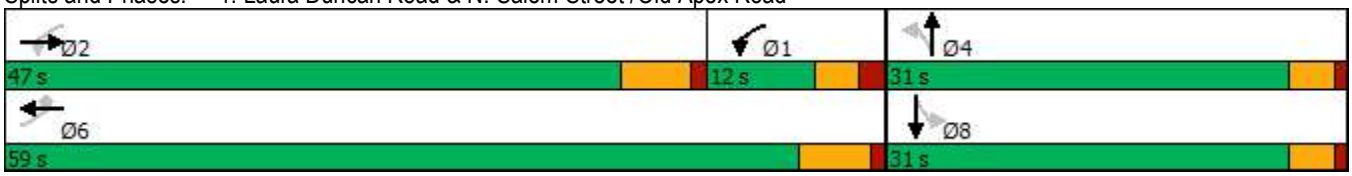
Laura Duncan Road

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	494	99	92	333	4	67	36	177	4	77	59
Future Volume (vph)	9	494	99	92	333	4	67	36	177	4	77	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850		0.914			0.935	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1796	1843	0	1761	1853	1575	0	1749	0	1778	1750	0
Flt Permitted	0.525			0.184				0.877		0.439		
Satd. Flow (perm)	993	1843	0	341	1853	1575	0	1553	0	822	1750	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				12		97			43	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	10	549	110	102	370	4	74	40	197	4	86	66
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	659	0	102	370	4	0	311	0	4	152	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	59.0	47.0		12.0	59.0	59.0	31.0	31.0		31.0	31.0	
Total Split (%)	65.6%	52.2%		13.3%	65.6%	65.6%	34.4%	34.4%		34.4%	34.4%	
Maximum Green (s)	53.2	41.2		7.2	53.2	53.2	27.0	27.0		27.0	27.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	35.7	27.0		34.9	35.7	35.7		13.6		13.6	13.6	
Actuated g/C Ratio	0.59	0.44		0.57	0.59	0.59		0.22		0.22	0.22	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.02	0.80		0.27	0.34	0.00		0.74		0.02	0.36	
Control Delay	6.1	24.0		11.9	7.6	1.5		28.4		22.5	19.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	6.1	24.0		11.9	7.6	1.5		28.4		22.5	19.9	
LOS	A	C		B	A	A		C		C	B	
Approach Delay		23.7			8.4			28.4			19.9	
Approach LOS		C			A			C			B	
Queue Length 50th (ft)	1	200		13	55	0		73		1	34	
Queue Length 95th (ft)	8	419		41	141	2		191		10	97	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	841	1306		385	1569	1336		816		406	886	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.01	0.50		0.26	0.24	0.00		0.38		0.01	0.17	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 60.8			
Natural Cycle: 60			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.80			
Intersection Signal Delay: 19.7		Intersection LOS: B	
Intersection Capacity Utilization 78.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road



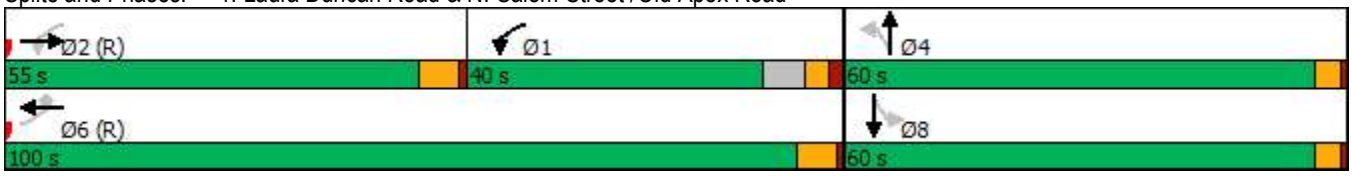
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	476	137	230	480	5	102	35	228	4	89	33
Future Volume (vph)	5	476	137	230	480	5	102	35	228	4	89	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.967				0.850		0.916			0.959	
Flt Protected	0.950			0.950				0.986		0.950		
Satd. Flow (prot)	1796	1828	0	1761	1853	1575	0	1750	0	1778	1795	0
Flt Permitted	0.387			0.167				0.772		0.378		
Satd. Flow (perm)	732	1828	0	310	1853	1575	0	1370	0	708	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				7		57			13	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	6	529	152	256	533	6	113	39	253	4	99	37
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	681	0	256	533	6	0	405	0	4	136	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	100.0	55.0		40.0	100.0	100.0	60.0	60.0		60.0	60.0	
Total Split (%)	62.5%	34.4%		25.0%	62.5%	62.5%	37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	94.2	49.2		35.2	94.2	94.2	56.0	56.0		56.0	56.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	105.8	77.6		100.8	105.8	105.8		44.2		44.2	44.2	
Actuated g/C Ratio	0.66	0.48		0.63	0.66	0.66		0.28		0.28	0.28	

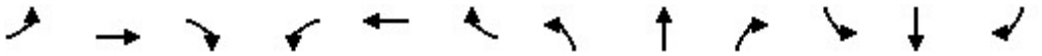
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.01	0.76		0.63	0.44	0.01		0.96		0.02	0.27	
Control Delay	12.8	42.5		29.2	3.9	0.0		84.1		36.5	40.0	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	12.8	42.5		29.2	3.9	0.0		84.1		36.5	40.0	
LOS	B	D		C	A	A		F		D	D	
Approach Delay		42.3			12.0			84.1			39.9	
Approach LOS		D			B			F			D	
Queue Length 50th (ft)	2	573		112	40	0		371		3	100	
Queue Length 95th (ft)	10	#1020		m230	164	m0		477		12	145	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	485	891		590	1229	1047		511		245	629	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.01	0.76		0.43	0.43	0.01		0.79		0.02	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 105 (66%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 38.6 Intersection LOS: D
Intersection Capacity Utilization 91.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road





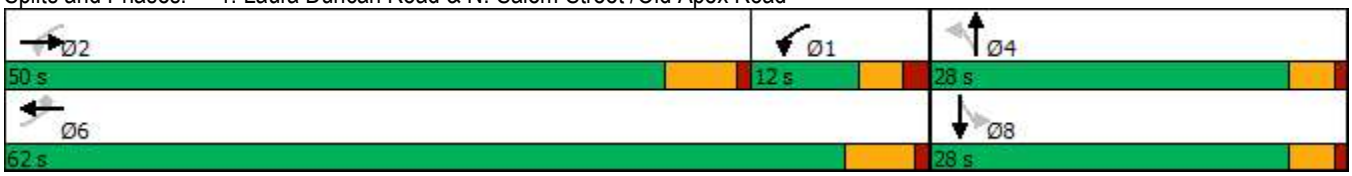
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	541	108	101	364	4	73	39	193	4	84	64
Future Volume (vph)	10	541	108	101	364	4	73	39	193	4	84	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850		0.915			0.935	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1796	1843	0	1761	1853	1575	0	1751	0	1778	1750	0
Flt Permitted	0.494			0.149				0.872		0.403		
Satd. Flow (perm)	934	1843	0	276	1853	1575	0	1546	0	754	1750	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				12		93			41	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	11	601	120	112	404	4	81	43	214	4	93	71
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	721	0	112	404	4	0	338	0	4	164	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	62.0	50.0		12.0	62.0	62.0	28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	55.6%		13.3%	68.9%	68.9%	31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	56.2	44.2		7.2	56.2	56.2	24.0	24.0		24.0	24.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	40.0	31.4		39.3	40.0	40.0		15.5		15.5	15.5	
Actuated g/C Ratio	0.60	0.47		0.59	0.60	0.60		0.23		0.23	0.23	

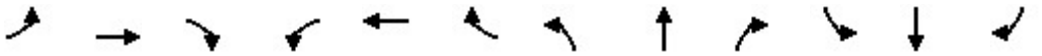
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.02	0.83		0.33	0.37	0.00		0.79		0.02	0.38	
Control Delay	6.1	25.9		16.1	8.0	1.5		34.4		24.8	22.3	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	6.1	25.9		16.1	8.0	1.5		34.4		24.8	22.3	
LOS	A	C		B	A	A		C		C	C	
Approach Delay		25.6			9.7			34.4			22.4	
Approach LOS		C			A			C			C	
Queue Length 50th (ft)	2	256		17	72	0		100		1	44	
Queue Length 95th (ft)	8	465		42	148	2		#238		10	110	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	762	1270		343	1512	1287		674		301	724	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.01	0.57		0.33	0.27	0.00		0.50		0.01	0.23	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 67.1
Natural Cycle: 65
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 22.3 Intersection LOS: C
Intersection Capacity Utilization 83.8% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road





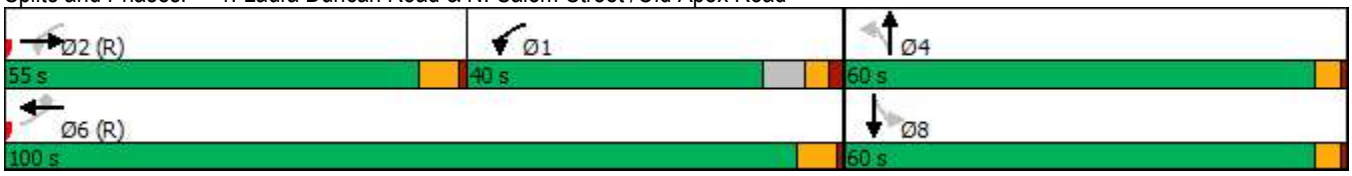
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	520	150	251	525	5	111	38	249	4	97	36
Future Volume (vph)	6	520	150	251	525	5	111	38	249	4	97	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966				0.850		0.915			0.959	
Flt Protected	0.950			0.950				0.986		0.950		
Satd. Flow (prot)	1796	1826	0	1761	1853	1575	0	1748	0	1778	1795	0
Flt Permitted	0.339			0.058				0.772		0.385		
Satd. Flow (perm)	641	1826	0	107	1853	1575	0	1368	0	721	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				7		58			13	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	7	578	167	279	583	6	123	42	277	4	108	40
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	745	0	279	583	6	0	442	0	4	148	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	100.0	55.0		40.0	100.0	100.0	60.0	60.0		60.0	60.0	
Total Split (%)	62.5%	34.4%		25.0%	62.5%	62.5%	37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	94.2	49.2		35.2	94.2	94.2	56.0	56.0		56.0	56.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	100.0	69.7		95.0	100.0	100.0		50.0		50.0	50.0	
Actuated g/C Ratio	0.62	0.44		0.59	0.62	0.62		0.31		0.31	0.31	

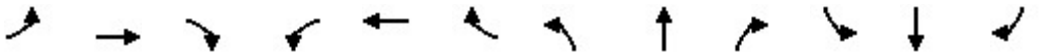
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.02	0.93		0.86	0.50	0.01		0.95		0.02	0.26	
Control Delay	15.0	61.6		59.3	5.9	0.4		75.8		33.2	36.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	15.0	61.6		59.3	5.9	0.4		75.8		33.2	36.8	
LOS	B	E		E	A	A		E		C	D	
Approach Delay		61.2			23.0			75.8			36.7	
Approach LOS		E			C			E			D	
Queue Length 50th (ft)	3	738		253	50	0		401		3	105	
Queue Length 95th (ft)	12	#1244		m347	m493	m1		520		12	151	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	406	800		487	1174	1000		519		253	641	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.02	0.93		0.57	0.50	0.01		0.85		0.02	0.23	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 105 (66%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 47.5 Intersection LOS: D
Intersection Capacity Utilization 97.8% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road



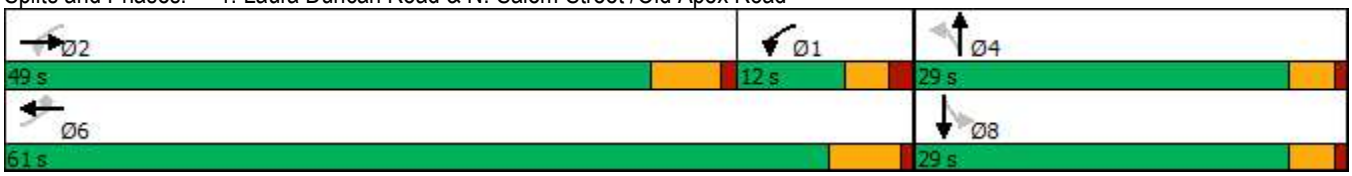


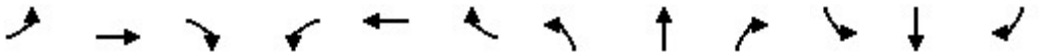
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	545	108	101	365	11	73	45	193	29	105	73
Future Volume (vph)	13	545	108	101	365	11	73	45	193	29	105	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850		0.916			0.939	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1796	1843	0	1761	1853	1575	0	1753	0	1778	1758	0
Flt Permitted	0.487			0.140				0.835		0.406		
Satd. Flow (perm)	921	1843	0	259	1853	1575	0	1482	0	760	1758	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		15				12		89			38	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	14	606	120	112	406	12	81	50	214	32	117	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	726	0	112	406	12	0	345	0	32	198	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	61.0	49.0		12.0	61.0	61.0	29.0	29.0		29.0	29.0	
Total Split (%)	67.8%	54.4%		13.3%	67.8%	67.8%	32.2%	32.2%		32.2%	32.2%	
Maximum Green (s)	55.2	43.2		7.2	55.2	55.2	25.0	25.0		25.0	25.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	41.1	32.5		40.4	41.1	41.1		17.1		17.1	17.1	
Actuated g/C Ratio	0.59	0.47		0.58	0.59	0.59		0.25		0.25	0.25	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.84		0.35	0.37	0.01		0.80		0.17	0.43	
Control Delay	6.6	27.5		18.2	8.6	3.5		36.1		27.3	23.9	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	6.6	27.5		18.2	8.6	3.5		36.1		27.3	23.9	
LOS	A	C		B	A	A		D		C	C	
Approach Delay		27.1			10.5			36.1			24.4	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	2	279		19	81	0		111		12	61	
Queue Length 95th (ft)	10	485		44	154	6		#263		38	136	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	719	1214		325	1446	1232		642		302	721	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.02	0.60		0.34	0.28	0.01		0.54		0.11	0.27	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 69.7			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 23.7		Intersection LOS: C	
Intersection Capacity Utilization 86.0%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	522	150	251	529	29	111	58	249	18	109	41
Future Volume (vph)	14	522	150	251	529	29	111	58	249	18	109	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.966				0.850		0.919			0.959	
Flt Protected	0.950			0.950				0.987		0.950		
Satd. Flow (prot)	1796	1826	0	1761	1853	1575	0	1757	0	1778	1795	0
Flt Permitted	0.321			0.062				0.764		0.384		
Satd. Flow (perm)	607	1826	0	115	1853	1575	0	1360	0	719	1795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9				32		51			13	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	16	580	167	279	588	32	123	64	277	20	121	46
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	747	0	279	588	32	0	464	0	20	167	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	100.0	55.0		40.0	100.0	100.0	60.0	60.0		60.0	60.0	
Total Split (%)	62.5%	34.4%		25.0%	62.5%	62.5%	37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	94.2	49.2		35.2	94.2	94.2	56.0	56.0		56.0	56.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	95.5	65.3		90.5	95.5	95.5		54.5		54.5	54.5	
Actuated g/C Ratio	0.60	0.41		0.57	0.60	0.60		0.34		0.34	0.34	

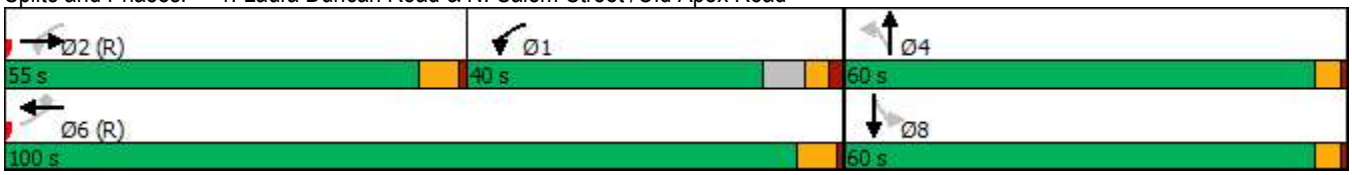
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.04	1.00		0.86	0.53	0.03		0.94		0.08	0.27	
Control Delay	16.0	77.8		58.3	6.8	0.3		71.7		34.0	35.1	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	16.0	77.8		58.3	6.8	0.3		71.7		34.0	35.1	
LOS	B	E		E	A	A		E		C	D	
Approach Delay		76.5			22.5			71.7			35.0	
Approach LOS		E			C			E			D	
Queue Length 50th (ft)	7	~832		253	56	0		419		14	114	
Queue Length 95th (ft)	20	#1249		m333	m482	m2		#604		35	170	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	372	750		487	1136	978		522		259	654	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.04	1.00		0.57	0.52	0.03		0.89		0.08	0.26	

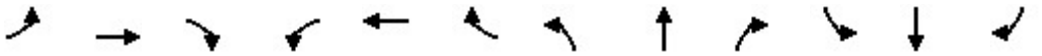
Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 105 (66%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 51.2 Intersection LOS: D
Intersection Capacity Utilization 99.9% ICU Level of Service F
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road



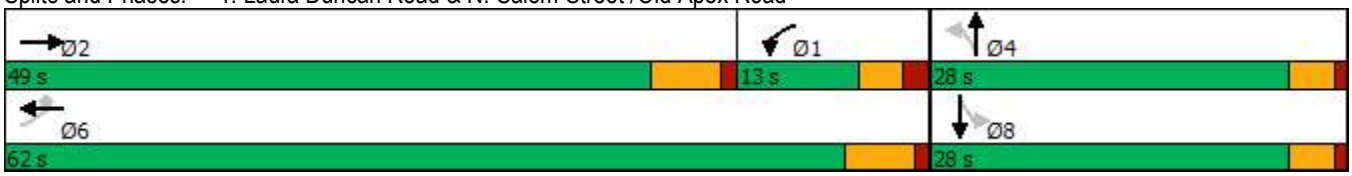


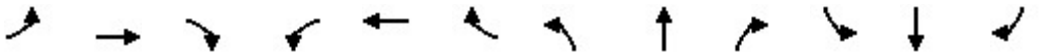
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	546	109	101	367	11	75	45	193	29	105	73
Future Volume (vph)	13	546	109	101	367	11	75	45	193	29	105	73
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.975				0.850		0.917			0.939	
Flt Protected	0.950			0.950				0.988		0.950		
Satd. Flow (prot)	1796	1843	0	1761	1853	1575	0	1755	0	1778	1758	0
Flt Permitted	0.485			0.950				0.816		0.400		
Satd. Flow (perm)	917	1843	0	1761	1853	1575	0	1450	0	749	1758	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16				12		86			37	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	14	607	121	112	408	12	83	50	214	32	117	81
Shared Lane Traffic (%)												
Lane Group Flow (vph)	14	728	0	112	408	12	0	347	0	32	198	0
Turn Type	D.Pm	NA		Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6					6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	62.0	49.0		13.0	62.0	62.0	28.0	28.0		28.0	28.0	
Total Split (%)	68.9%	54.4%		14.4%	68.9%	68.9%	31.1%	31.1%		31.1%	31.1%	
Maximum Green (s)	56.2	43.2		8.2	56.2	56.2	24.0	24.0		24.0	24.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	Min	Min		None	Min	Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	44.0	34.6		8.3	44.0	44.0		18.1		18.1	18.1	
Actuated g/C Ratio	0.60	0.47		0.11	0.60	0.60		0.25		0.25	0.25	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.03	0.83		0.56	0.37	0.01		0.82		0.17	0.43	
Control Delay	6.3	27.5		50.1	8.5	3.3		39.1		28.1	24.7	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	6.3	27.5		50.1	8.5	3.3		39.1		28.1	24.7	
LOS	A	C		D	A	A		D		C	C	
Approach Delay		27.1			17.1			39.1			25.2	
Approach LOS		C			B			D			C	
Queue Length 50th (ft)	2	307		55	90	0		123		12	66	
Queue Length 95th (ft)	10	488		#146	149	6		#284		39	139	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	703	1182		212	1422	1211		558		259	632	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.02	0.62		0.53	0.29	0.01		0.62		0.12	0.31	

Intersection Summary			
Area Type:	Other		
Cycle Length: 90			
Actuated Cycle Length: 73.1			
Natural Cycle: 65			
Control Type: Actuated-Uncoordinated			
Maximum v/c Ratio: 0.83			
Intersection Signal Delay: 26.2		Intersection LOS: C	
Intersection Capacity Utilization 86.2%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	533	159	251	540	29	118	58	249	18	109	43
Future Volume (vph)	16	533	159	251	540	29	118	58	249	18	109	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		-3%			1%			-8%			-1%	
Storage Length (ft)	100		0	200		0	0		0	125		0
Storage Lanes	1		0	1		1	0		0	1		0
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.965				0.850		0.921			0.957	
Flt Protected	0.950			0.950				0.986		0.950		
Satd. Flow (prot)	1796	1825	0	1761	1853	1575	0	1759	0	1778	1792	0
Flt Permitted	0.304			0.065				0.764		0.394		
Satd. Flow (perm)	575	1825	0	120	1853	1575	0	1363	0	738	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				32		49			14	
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		460			2106			1115			350	
Travel Time (s)		7.0			31.9			16.9			5.3	
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)	18	592	177	279	600	32	131	64	277	20	121	48
Shared Lane Traffic (%)												
Lane Group Flow (vph)	18	769	0	279	600	32	0	472	0	20	169	0
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2		1	6			4			8	
Permitted Phases	6			2		6	4			8		
Detector Phase	6	2		1	6	6	4	4		8	8	
Switch Phase												
Minimum Initial (s)	12.0	12.0		7.0	12.0	12.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	21.0	18.0		12.0	21.0	21.0	11.0	11.0		21.0	21.0	
Total Split (s)	100.0	55.0		40.0	100.0	100.0	60.0	60.0		60.0	60.0	
Total Split (%)	62.5%	34.4%		25.0%	62.5%	62.5%	37.5%	37.5%		37.5%	37.5%	
Maximum Green (s)	94.2	49.2		35.2	94.2	94.2	56.0	56.0		56.0	56.0	
Yellow Time (s)	4.8	4.8		3.0	4.8	4.8	3.0	3.0		3.0	3.0	
All-Red Time (s)	1.0	1.0		1.8	1.0	1.0	1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-0.8	-0.8		0.2	-0.8	-0.8		1.0		1.0	1.0	
Total Lost Time (s)	5.0	5.0		5.0	5.0	5.0		5.0		5.0	5.0	
Lead/Lag		Lead		Lag								
Lead-Lag Optimize?		Yes		Yes								
Vehicle Extension (s)	6.0	6.0		2.0	6.0	6.0	2.0	2.0		3.0	3.0	
Minimum Gap (s)	3.2	3.2		2.0	3.2	3.2	2.0	2.0		3.0	3.0	
Time Before Reduce (s)	15.0	15.0		0.0	15.0	15.0	0.0	0.0		0.0	0.0	
Time To Reduce (s)	30.0	30.0		0.0	30.0	30.0	0.0	0.0		0.0	0.0	
Recall Mode	C-Min	C-Min		None	C-Min	C-Min	None	None		None	None	
Walk Time (s)	4.0				4.0	4.0				4.0	4.0	
Flash Dont Walk (s)	11.0				11.0	11.0				13.0	13.0	
Pedestrian Calls (#/hr)	0				0	0				0	0	
Act Effct Green (s)	93.1	62.9		88.1	93.1	93.1		56.9		56.9	56.9	
Actuated g/C Ratio	0.58	0.39		0.55	0.58	0.58		0.36		0.36	0.36	

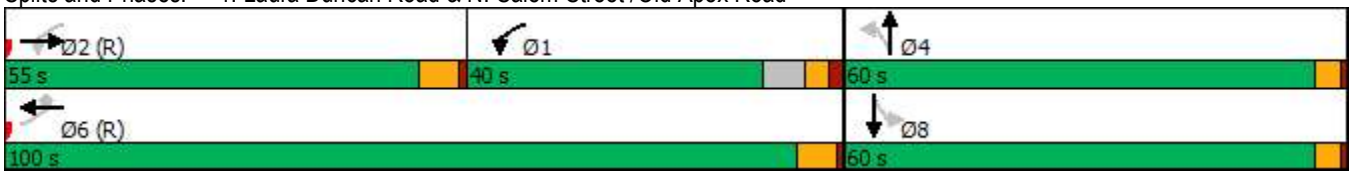
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
v/c Ratio	0.05	1.06		0.86	0.56	0.03		0.91		0.08	0.26	
Control Delay	16.9	96.5		57.9	7.7	0.3		66.8		32.9	33.6	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0		0.0	0.0	
Total Delay	16.9	96.5		57.9	7.7	0.3		66.8		32.9	33.6	
LOS	B	F		E	A	A		E		C	C	
Approach Delay		94.7			22.8			66.8			33.5	
Approach LOS		F			C			E			C	
Queue Length 50th (ft)	8	~907		251	59	0		423		14	112	
Queue Length 95th (ft)	23	#1298		m325	m486	m2		#626		35	171	
Internal Link Dist (ft)		380			2026			1035			270	
Turn Bay Length (ft)	100			200						125		
Base Capacity (vph)	347	723		487	1120	964		530		270	665	
Starvation Cap Reductn	0	0		0	0	0		0		0	0	
Spillback Cap Reductn	0	0		0	0	0		0		0	0	
Storage Cap Reductn	0	0		0	0	0		0		0	0	
Reduced v/c Ratio	0.05	1.06		0.57	0.54	0.03		0.89		0.07	0.25	

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 105 (66%), Referenced to phase 2:EBWB and 6:EBWB, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.06
Intersection Signal Delay: 56.5 Intersection LOS: E
Intersection Capacity Utilization 101.5% 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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Laura Duncan Road & N. Salem Street /Old Apex Road



APPENDIX E

CAPACITY ANALYSIS CALCULATIONS

Laura Duncan Road

&

Candun Drive/Access A

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	15	11	4	44	127	20
Future Vol, veh/h	15	11	4	44	127	20
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	17	12	4	49	141	22

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	209	152	163	0	-	0
Stage 1	152	-	-	-	-	-
Stage 2	57	-	-	-	-	-
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	779	894	1416	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	777	894	1416	-	-	-
Mov Cap-2 Maneuver	777	-	-	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1416	-	823	-	-
HCM Lane V/C Ratio	0.003	-	0.035	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	12	6	4	44	119	17
Future Vol, veh/h	12	6	4	44	119	17
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	13	7	4	49	132	19

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	199	142	151	0	-	0
Stage 1	142	-	-	-	-	-
Stage 2	57	-	-	-	-	-
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	790	906	1430	-	-	-
Stage 1	885	-	-	-	-	-
Stage 2	966	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	788	906	1430	-	-	-
Mov Cap-2 Maneuver	788	-	-	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	966	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1430	-	824	-	-
HCM Lane V/C Ratio	0.003	-	0.024	-	-
HCM Control Delay (s)	7.5	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	16	12	4	48	139	23
Future Vol, veh/h	16	12	4	48	139	23
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	18	13	4	53	154	26

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	228	167	180	0	-	0
Stage 1	167	-	-	-	-	-
Stage 2	61	-	-	-	-	-
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	760	877	1396	-	-	-
Stage 1	863	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	758	877	1396	-	-	-
Mov Cap-2 Maneuver	758	-	-	-	-	-
Stage 1	860	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1396	-	805	-	-
HCM Lane V/C Ratio	0.003	-	0.039	-	-
HCM Control Delay (s)	7.6	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	7	4	48	130	19
Future Vol, veh/h	13	7	4	48	130	19
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	14	8	4	53	144	21

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	216	155	165	0	-	0
Stage 1	155	-	-	-	-	-
Stage 2	61	-	-	-	-	-
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	772	891	1413	-	-	-
Stage 1	873	-	-	-	-	-
Stage 2	962	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	891	1413	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	870	-	-	-	-	-
Stage 2	962	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1413	-	808	-	-
HCM Lane V/C Ratio	0.003	-	0.028	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	4	34	30	4	4	11	49	9	4	143	23
Future Vol, veh/h	16	4	34	30	4	4	11	49	9	4	143	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	18	4	38	33	4	4	12	54	10	4	159	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	267	268	172	284	276	59	185	0	0	64	0	0
Stage 1	180	180	-	83	83	-	-	-	-	-	-	-
Stage 2	87	88	-	201	193	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	686	638	872	668	632	1007	1390	-	-	1538	-	-
Stage 1	822	750	-	925	826	-	-	-	-	-	-	-
Stage 2	921	822	-	801	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	673	630	872	630	624	1007	1390	-	-	1538	-	-
Mov Cap-2 Maneuver	673	630	-	630	624	-	-	-	-	-	-	-
Stage 1	815	748	-	917	819	-	-	-	-	-	-	-
Stage 2	904	815	-	759	739	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	10.9	1.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1390	-	-	781	655	1538	-	-
HCM Lane V/C Ratio	0.009	-	-	0.077	0.064	0.003	-	-
HCM Control Delay (s)	7.6	0	-	10	10.9	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	4	19	17	4	4	21	52	28	4	132	19
Future Vol, veh/h	13	4	19	17	4	4	21	52	28	4	132	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	14	4	21	19	4	4	23	58	31	4	147	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	290	301	158	298	296	74	168	0	0	89	0	0
Stage 1	166	166	-	120	120	-	-	-	-	-	-	-
Stage 2	124	135	-	178	176	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	662	612	887	654	616	988	1410	-	-	1506	-	-
Stage 1	836	761	-	884	796	-	-	-	-	-	-	-
Stage 2	880	785	-	824	753	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	645	600	887	625	604	988	1410	-	-	1506	-	-
Mov Cap-2 Maneuver	645	600	-	625	604	-	-	-	-	-	-	-
Stage 1	822	759	-	869	782	-	-	-	-	-	-	-
Stage 2	856	772	-	797	751	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	10.7	1.6	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1410	-	-	746	660	1506	-	-
HCM Lane V/C Ratio	0.017	-	-	0.054	0.042	0.003	-	-
HCM Control Delay (s)	7.6	0	-	10.1	10.7	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	16	4	34	30	4	4	11	49	9	4	143	23
Future Vol, veh/h	16	4	34	30	4	4	11	49	9	4	143	23
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	18	4	38	33	4	4	12	54	10	4	159	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	267	268	172	284	276	59	185	0	0	64	0	0
Stage 1	180	180	-	83	83	-	-	-	-	-	-	-
Stage 2	87	88	-	201	193	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	686	638	872	668	632	1007	1390	-	-	1538	-	-
Stage 1	822	750	-	925	826	-	-	-	-	-	-	-
Stage 2	921	822	-	801	741	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	673	630	872	630	624	1007	1390	-	-	1538	-	-
Mov Cap-2 Maneuver	673	630	-	630	624	-	-	-	-	-	-	-
Stage 1	815	748	-	917	819	-	-	-	-	-	-	-
Stage 2	904	815	-	759	739	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10	10.9	1.2	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1390	-	-	781	655	1538	-	-
HCM Lane V/C Ratio	0.009	-	-	0.077	0.064	0.003	-	-
HCM Control Delay (s)	7.6	0	-	10	10.9	7.3	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	13	4	19	17	4	4	21	54	28	4	134	19
Future Vol, veh/h	13	4	19	17	4	4	21	54	28	4	134	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
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	14	4	21	19	4	4	23	60	31	4	149	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	294	305	160	302	300	76	170	0	0	91	0	0
Stage 1	168	168	-	122	122	-	-	-	-	-	-	-
Stage 2	126	137	-	180	178	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	658	608	885	650	612	985	1407	-	-	1504	-	-
Stage 1	834	759	-	882	795	-	-	-	-	-	-	-
Stage 2	878	783	-	822	752	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	642	596	885	621	600	985	1407	-	-	1504	-	-
Mov Cap-2 Maneuver	642	596	-	621	600	-	-	-	-	-	-	-
Stage 1	820	757	-	867	781	-	-	-	-	-	-	-
Stage 2	854	770	-	795	750	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.1	10.7	1.5	0.2
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1407	-	-	743	656	1504	-	-
HCM Lane V/C Ratio	0.017	-	-	0.054	0.042	0.003	-	-
HCM Control Delay (s)	7.6	0	-	10.1	10.7	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0.1	0	-	-

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS

N. Salem Street

&

Candun Drive

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	596	456	4	6	18
Future Vol, veh/h	23	596	456	4	6	18
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	26	662	507	4	7	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	511	0	-	0	1223	509
Stage 1	-	-	-	-	509	-
Stage 2	-	-	-	-	714	-
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	1054	-	-	-	198	564
Stage 1	-	-	-	-	604	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1054	-	-	-	193	564
Mov Cap-2 Maneuver	-	-	-	-	330	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	485	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1054	-	-	-	479
HCM Lane V/C Ratio	0.024	-	-	-	0.056
HCM Control Delay (s)	8.5	-	-	-	13
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	18	616	615	4	4	16
Future Vol, veh/h	18	616	615	4	4	16
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	20	684	683	4	4	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	687	0	-	0	1409	685
Stage 1	-	-	-	-	685	-
Stage 2	-	-	-	-	724	-
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	907	-	-	-	153	448
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	480	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	907	-	-	-	150	448
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	489	-
Stage 2	-	-	-	-	480	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	907	-	-	-	404
HCM Lane V/C Ratio	0.022	-	-	-	0.055
HCM Control Delay (s)	9.1	-	-	-	14.4
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	652	498	4	7	20
Future Vol, veh/h	25	652	498	4	7	20
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	28	724	553	4	8	22

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	557	0	-	0	1335	555			
Stage 1	-	-	-	-	555	-			
Stage 2	-	-	-	-	780	-			
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	1014	-	-	-	169	531			
Stage 1	-	-	-	-	575	-			
Stage 2	-	-	-	-	452	-			
Platoon blocked, %		-	-	-					
Mov Cap-1 Maneuver	1014	-	-	-	164	531			
Mov Cap-2 Maneuver	-	-	-	-	302	-			
Stage 1	-	-	-	-	559	-			
Stage 2	-	-	-	-	452	-			

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1014	-	-	-	444
HCM Lane V/C Ratio	0.027	-	-	-	0.068
HCM Control Delay (s)	8.7	-	-	-	13.7
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	673	672	4	4	17
Future Vol, veh/h	20	673	672	4	4	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	22	748	747	4	4	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	751	0	-	0	1541	749
Stage 1	-	-	-	-	749	-
Stage 2	-	-	-	-	792	-
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	858	-	-	-	127	412
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	446	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	858	-	-	-	124	412
Mov Cap-2 Maneuver	-	-	-	-	262	-
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	446	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	858	-	-	-	371
HCM Lane V/C Ratio	0.026	-	-	-	0.063
HCM Control Delay (s)	9.3	-	-	-	15.4
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	655	507	4	11	41
Future Vol, veh/h	31	655	507	4	11	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	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	34	728	563	4	12	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	567	0	-	0	1361	565
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	796	-
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	1005	-	-	-	163	524
Stage 1	-	-	-	-	569	-
Stage 2	-	-	-	-	444	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1005	-	-	-	157	524
Mov Cap-2 Maneuver	-	-	-	-	295	-
Stage 1	-	-	-	-	550	-
Stage 2	-	-	-	-	444	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1005	-	-	-	450
HCM Lane V/C Ratio	0.034	-	-	-	0.128
HCM Control Delay (s)	8.7	-	-	-	14.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	681	677	4	5	29
Future Vol, veh/h	40	681	677	4	5	29
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	44	757	752	4	6	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1599	754
Stage 1	-	-	-	-	754	-
Stage 2	-	-	-	-	845	-
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	855	-	-	-	117	409
Stage 1	-	-	-	-	465	-
Stage 2	-	-	-	-	421	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	855	-	-	-	111	409
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	421	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	855	-	-	-	373
HCM Lane V/C Ratio	0.052	-	-	-	0.101
HCM Control Delay (s)	9.4	-	-	-	15.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	31	657	511	4	11	41
Future Vol, veh/h	31	657	511	4	11	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	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	34	730	568	4	12	46

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	572	0	-	0	1368	570
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	798	-
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	1001	-	-	-	162	521
Stage 1	-	-	-	-	566	-
Stage 2	-	-	-	-	443	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1001	-	-	-	156	521
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	547	-
Stage 2	-	-	-	-	443	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1001	-	-	-	447
HCM Lane V/C Ratio	0.034	-	-	-	0.129
HCM Control Delay (s)	8.7	-	-	-	14.2
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	40	703	697	4	5	29
Future Vol, veh/h	40	703	697	4	5	29
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	44	781	774	4	6	32

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	778	0	-	0	1645	776
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	869	-
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	839	-	-	-	109	397
Stage 1	-	-	-	-	454	-
Stage 2	-	-	-	-	410	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	839	-	-	-	103	397
Mov Cap-2 Maneuver	-	-	-	-	239	-
Stage 1	-	-	-	-	430	-
Stage 2	-	-	-	-	410	-

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	839	-	-	-	362
HCM Lane V/C Ratio	0.053	-	-	-	0.104
HCM Control Delay (s)	9.5	-	-	-	16.1
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	0.3

APPENDIX G

CAPACITY ANALYSIS CALCULATIONS

N. Salem Street

&

Salem Church Road

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	494	379	95	125	4
Future Vol, veh/h	4	494	379	95	125	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	549	421	106	139	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	421	0	-	0	978	421
Stage 1	-	-	-	-	421	-
Stage 2	-	-	-	-	557	-
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	1138	-	-	0	278	632
Stage 1	-	-	-	0	662	-
Stage 2	-	-	-	0	574	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1138	-	-	-	277	632
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	659	-
Stage 2	-	-	-	-	574	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	29.8
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	1138	-	-	277	632
HCM Lane V/C Ratio	0.004	-	-	0.501	0.007
HCM Control Delay (s)	8.2	0	-	30.4	10.7
HCM Lane LOS	A	A	-	D	B
HCM 95th %tile Q(veh)	0	-	-	2.6	0

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	482	500	131	152	9
Future Vol, veh/h	4	482	500	131	152	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	536	556	146	169	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	556	0	-	0	1100	556
Stage 1	-	-	-	-	556	-
Stage 2	-	-	-	-	544	-
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	1015	-	-	0	235	531
Stage 1	-	-	-	0	574	-
Stage 2	-	-	-	0	582	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1015	-	-	-	234	531
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	582	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	49.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	1015	-	-	234	531
HCM Lane V/C Ratio	0.004	-	-	0.722	0.019
HCM Control Delay (s)	8.6	0	-	52.2	11.9
HCM Lane LOS	A	A	-	F	B
HCM 95th %tile Q(veh)	0	-	-	4.9	0.1

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	540	414	104	137	4
Future Vol, veh/h	4	540	414	104	137	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	600	460	116	152	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	460	0	-	0	1068	460
Stage 1	-	-	-	-	460	-
Stage 2	-	-	-	-	608	-
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	1101	-	-	0	245	601
Stage 1	-	-	-	0	636	-
Stage 2	-	-	-	0	543	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1101	-	-	-	244	601
Mov Cap-2 Maneuver	-	-	-	-	244	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	40.5
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	1101	-	-	244	601
HCM Lane V/C Ratio	0.004	-	-	0.624	0.007
HCM Control Delay (s)	8.3	0	-	41.4	11
HCM Lane LOS	A	A	-	E	B
HCM 95th %tile Q(veh)	0	-	-	3.8	0

Intersection	
Int Delay, s/veh	12

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	527	546	143	166	10
Future Vol, veh/h	4	527	546	143	166	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	586	607	159	184	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	607	0	-	0	1201	607
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	594	-
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	971	-	-	0	204	496
Stage 1	-	-	-	0	544	-
Stage 2	-	-	-	0	552	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	971	-	-	-	203	496
Mov Cap-2 Maneuver	-	-	-	-	203	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	552	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	85.4
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	971	-	-	203	496
HCM Lane V/C Ratio	0.005	-	-	0.909	0.022
HCM Control Delay (s)	8.7	0	-	89.8	12.4
HCM Lane LOS	A	A	-	F	B
HCM 95th %tile Q(veh)	0	-	-	7.2	0.1

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	546	435	113	140	4
Future Vol, veh/h	4	546	435	113	140	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	607	483	126	156	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	483	0	-	0	1098	483
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	615	-
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	1080	-	-	0	235	584
Stage 1	-	-	-	0	620	-
Stage 2	-	-	-	0	539	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1080	-	-	-	234	584
Mov Cap-2 Maneuver	-	-	-	-	234	-
Stage 1	-	-	-	-	616	-
Stage 2	-	-	-	-	539	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	45.4
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	1080	-	-	234	584
HCM Lane V/C Ratio	0.004	-	-	0.665	0.008
HCM Control Delay (s)	8.3	0	-	46.4	11.2
HCM Lane LOS	A	A	-	E	B
HCM 95th %tile Q(veh)	0	-	-	4.2	0

Intersection	
Int Delay, s/veh	15.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	547	558	148	174	10
Future Vol, veh/h	4	547	558	148	174	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	-	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	608	620	164	193	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	620	0	-	0	1236	620
Stage 1	-	-	-	-	620	-
Stage 2	-	-	-	-	616	-
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	960	-	-	0	195	488
Stage 1	-	-	-	0	536	-
Stage 2	-	-	-	0	539	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	960	-	-	-	194	488
Mov Cap-2 Maneuver	-	-	-	-	194	-
Stage 1	-	-	-	-	533	-
Stage 2	-	-	-	-	539	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	108.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	960	-	-	194	488
HCM Lane V/C Ratio	0.005	-	-	0.997	0.023
HCM Control Delay (s)	8.8	0	-	114	12.5
HCM Lane LOS	A	A	-	F	B
HCM 95th %tile Q(veh)	0	-	-	8.5	0.1

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	548	439	113	140	4
Future Vol, veh/h	4	548	439	113	140	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	50	-	-	125	200	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	609	488	126	156	4

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	488	0	-	0	1105	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	617	-
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	1075	-	-	0	233	580
Stage 1	-	-	-	0	617	-
Stage 2	-	-	-	0	538	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	1075	-	-	-	232	580
Mov Cap-2 Maneuver	-	-	-	-	367	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	538	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	21.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	1075	-	-	367	580
HCM Lane V/C Ratio	0.004	-	-	0.424	0.008
HCM Control Delay (s)	8.4	-	-	21.8	11.3
HCM Lane LOS	A	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	2	0

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	569	578	148	174	13
Future Vol, veh/h	7	569	578	148	174	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	Free	-	None
Storage Length	50	-	-	125	200	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	632	642	164	193	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	642	0	-	0	1290	642
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	648	-
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	943	-	-	0	~ 180	474
Stage 1	-	-	-	0	524	-
Stage 2	-	-	-	0	521	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	943	-	-	-	~ 179	474
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	520	-
Stage 2	-	-	-	-	521	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	30.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	943	-	-	319	474
HCM Lane V/C Ratio	0.008	-	-	0.606	0.03
HCM Control Delay (s)	8.8	-	-	32.2	12.8
HCM Lane LOS	A	-	-	D	B
HCM 95th %tile Q(veh)	0	-	-	3.7	0.1

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

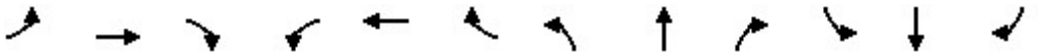
APPENDIX H

CAPACITY ANALYSIS CALCULATIONS

Old Apex Road

&

Cary Parkway

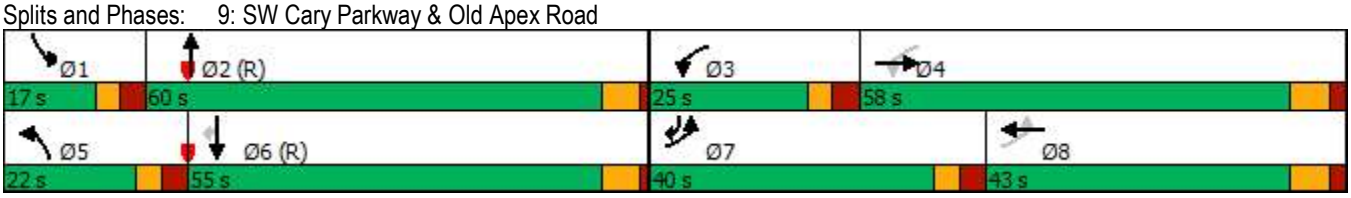


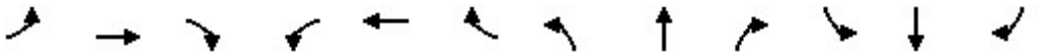
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	189	494	166	175	338	20	121	858	163	18	774	104
Future Volume (vph)	189	494	166	175	338	20	121	858	163	18	774	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.962			0.992			0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	1770	3511	0	1770	3454	0	1770	3539	1583
Flt Permitted	0.364			0.105			0.950			0.950		
Satd. Flow (perm)	678	3405	0	196	3511	0	1770	3454	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			3			15				68
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1192			1032	
Travel Time (s)		31.9			27.1			18.1			15.6	
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)	210	549	184	194	376	22	134	953	181	20	860	116
Shared Lane Traffic (%)												
Lane Group Flow (vph)	210	733	0	194	398	0	134	1134	0	20	860	116
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	40.0	58.0		25.0	43.0		22.0	60.0		17.0	55.0	40.0
Total Split (%)	25.0%	36.3%		15.6%	26.9%		13.8%	37.5%		10.6%	34.4%	25.0%
Maximum Green (s)	33.7	51.2		18.6	36.2		15.7	54.3		10.9	49.2	33.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	56.5	39.3		56.5	37.8		17.1	80.5		8.2	66.5	90.2
Actuated g/C Ratio	0.35	0.25		0.35	0.24		0.11	0.50		0.05	0.42	0.56
v/c Ratio	0.57	0.85		0.82	0.48		0.71	0.65		0.22	0.59	0.13
Control Delay	39.8	65.2		66.5	53.7		88.8	33.8		78.8	40.5	8.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	39.8	65.2		66.5	53.7		88.8	33.8		78.8	40.5	8.9

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	E		E	D		F	C		E	D	A
Approach Delay		59.5			57.8			39.6			37.6	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	152	373		145	188		138	482		20	366	22
Queue Length 95th (ft)	198	425		225	232		207	640		52	515	64
Internal Link Dist (ft)		2026			1707			1112			952	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	499	1148		268	877		207	1746		132	1470	1076
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.42	0.64		0.72	0.45		0.65	0.65		0.15	0.59	0.11

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 35 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.85			
Intersection Signal Delay: 46.8		Intersection LOS: D	
Intersection Capacity Utilization 80.1%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 9: SW Cary Parkway & Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	225	412	164	177	533	60	211	1001	128	23	987	189
Future Volume (vph)	225	412	164	177	533	60	211	1001	128	23	987	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.957			0.985			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3387	0	1770	3486	0	1770	3479	0	1770	3539	1583
Flt Permitted	0.123			0.123			0.950			0.950		
Satd. Flow (perm)	229	3387	0	229	3486	0	1770	3479	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			7			10				111
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1192			1032	
Travel Time (s)		31.9			27.1			18.1			15.6	
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)	250	458	182	197	592	67	234	1112	142	26	1097	210
Shared Lane Traffic (%)												
Lane Group Flow (vph)	250	640	0	197	659	0	234	1254	0	26	1097	210
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	22.0	40.0		30.0	48.0		25.0	70.0		20.0	65.0	22.0
Total Split (%)	13.8%	25.0%		18.8%	30.0%		15.6%	43.8%		12.5%	40.6%	13.8%
Maximum Green (s)	15.7	33.2		23.6	41.2		18.7	64.3		13.9	59.2	15.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	53.0	34.6		53.0	36.0		26.0	83.8		8.4	60.9	82.9
Actuated g/C Ratio	0.33	0.22		0.33	0.22		0.16	0.52		0.05	0.38	0.52
v/c Ratio	1.05	0.84		0.78	0.83		0.81	0.69		0.28	0.81	0.24
Control Delay	112.4	75.3		61.0	68.1		85.6	32.7		80.6	50.6	10.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	112.4	75.3		61.0	68.1		85.6	32.7		80.6	50.6	10.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	E		E	E		F	C		F	D	B
Approach Delay		85.7			66.5			41.0			44.9	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~232	323		149	348		237	530		27	546	53
Queue Length 95th (ft)	m#375	404		227	398		#450	692		61	640	105
Internal Link Dist (ft)		2026			1707			1112			952	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	239	776		321	941		288	1826		165	1348	874
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.05	0.82		0.61	0.70		0.81	0.69		0.16	0.81	0.24

Intersection Summary

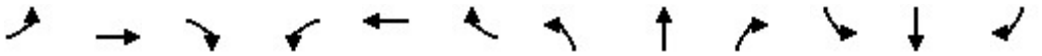
Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 137 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 55.6 Intersection LOS: E
Intersection Capacity Utilization 84.7% ICU Level of Service E
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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: SW Cary Parkway & Old Apex Road

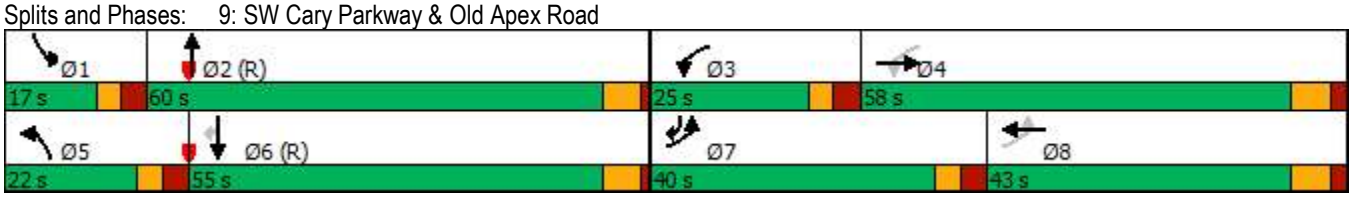


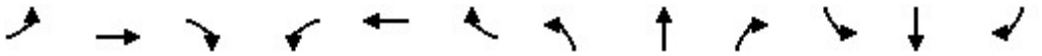
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	207	540	181	191	369	22	132	938	178	20	846	114
Future Volume (vph)	207	540	181	191	369	22	132	938	178	20	846	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.962			0.992			0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3405	0	1770	3511	0	1770	3454	0	1770	3539	1583
Flt Permitted	0.346			0.095			0.950			0.950		
Satd. Flow (perm)	645	3405	0	177	3511	0	1770	3454	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		31			3			15				68
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1192			1032	
Travel Time (s)		31.9			27.1			18.1			15.6	
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)	230	600	201	212	410	24	147	1042	198	22	940	127
Shared Lane Traffic (%)												
Lane Group Flow (vph)	230	801	0	212	434	0	147	1240	0	22	940	127
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	40.0	58.0		25.0	43.0		22.0	60.0		17.0	55.0	40.0
Total Split (%)	25.0%	36.3%		15.6%	26.9%		13.8%	37.5%		10.6%	34.4%	25.0%
Maximum Green (s)	33.7	51.2		18.6	36.2		15.7	54.3		10.9	49.2	33.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	60.1	42.4		60.1	40.6		17.6	76.8		8.3	62.3	86.8
Actuated g/C Ratio	0.38	0.26		0.38	0.25		0.11	0.48		0.05	0.39	0.54
v/c Ratio	0.61	0.87		0.88	0.49		0.76	0.74		0.24	0.68	0.14
Control Delay	38.4	64.1		75.7	51.8		92.6	39.0		79.3	45.8	10.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.4	64.1		75.7	51.8		92.6	39.0		79.3	45.8	10.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	E		E	D		F	D		E	D	B
Approach Delay		58.4			59.7			44.7			42.3	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	161	409		167	202		151	581		23	438	29
Queue Length 95th (ft)	208	462		#274	248		232	#797		55	576	72
Internal Link Dist (ft)		2026			1707			1112			952	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	508	1148		267	914		207	1665		132	1377	1036
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.45	0.70		0.79	0.47		0.71	0.74		0.17	0.68	0.12

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 35 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 49.8		Intersection LOS: D	
Intersection Capacity Utilization 85.4%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: SW Cary Parkway & Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	246	450	179	193	582	66	231	1094	140	25	1079	207
Future Volume (vph)	246	450	179	193	582	66	231	1094	140	25	1079	207
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.957			0.985			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3387	0	1770	3486	0	1770	3479	0	1770	3539	1583
Flt Permitted	0.105			0.112			0.950			0.950		
Satd. Flow (perm)	196	3387	0	209	3486	0	1770	3479	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		34			7			10				111
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1192			1032	
Travel Time (s)		31.9			27.1			18.1			15.6	
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)	273	500	199	214	647	73	257	1216	156	28	1199	230
Shared Lane Traffic (%)												
Lane Group Flow (vph)	273	699	0	214	720	0	257	1372	0	28	1199	230
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	22.0	40.0		30.0	48.0		25.0	70.0		20.0	65.0	22.0
Total Split (%)	13.8%	25.0%		18.8%	30.0%		15.6%	43.8%		12.5%	40.6%	13.8%
Maximum Green (s)	15.7	33.2		23.6	41.2		18.7	64.3		13.9	59.2	15.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	55.5	36.0		55.5	38.5		24.5	81.3		8.5	60.0	82.0
Actuated g/C Ratio	0.35	0.22		0.35	0.24		0.15	0.51		0.05	0.38	0.51
v/c Ratio	1.17	0.89		0.82	0.85		0.95	0.77		0.30	0.90	0.27
Control Delay	143.4	76.2		66.1	68.0		107.8	37.4		81.2	57.7	11.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	143.4	76.2		66.1	68.0		107.8	37.4		81.2	57.7	11.7

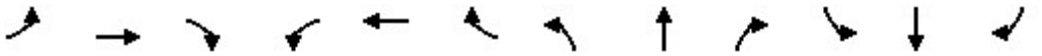
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	E		E	E		F	D		F	E	B
Approach Delay		95.1			67.5			48.5			50.9	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~286	353		165	372		~287	654		29	623	64
Queue Length 95th (ft)	m#363	m#436		256	442		#506	797		64	725	120
Internal Link Dist (ft)		2026			1707			1112			952	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	234	790		320	941		271	1772		165	1327	865
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.17	0.88		0.67	0.77		0.95	0.77		0.17	0.90	0.27

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 137 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.17
Intersection Signal Delay: 61.8 Intersection LOS: E
Intersection Capacity Utilization 91.1% ICU Level of Service F
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.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 11: SW Cary Parkway & Old Apex Road



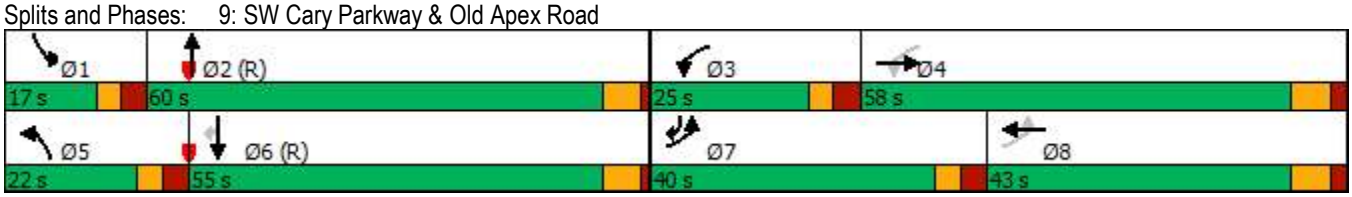
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	549	193	191	372	22	135	938	178	20	846	117
Future Volume (vph)	216	549	193	191	372	22	135	938	178	20	846	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.961			0.992			0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3401	0	1770	3511	0	1770	3454	0	1770	3539	1583
Flt Permitted	0.346			0.093			0.950			0.950		
Satd. Flow (perm)	645	3401	0	173	3511	0	1770	3454	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			3			15				68
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1196			1042	
Travel Time (s)		31.9			27.1			18.1			15.8	
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)	240	610	214	212	413	24	150	1042	198	22	940	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	824	0	212	437	0	150	1240	0	22	940	130
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	40.0	58.0		25.0	43.0		22.0	60.0		17.0	55.0	40.0
Total Split (%)	25.0%	36.3%		15.6%	26.9%		13.8%	37.5%		10.6%	34.4%	25.0%
Maximum Green (s)	33.7	51.2		18.6	36.2		15.7	54.3		10.9	49.2	33.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	61.2	43.6		61.2	41.2		17.6	75.7		8.3	61.2	86.3
Actuated g/C Ratio	0.38	0.27		0.38	0.26		0.11	0.47		0.05	0.38	0.54
v/c Ratio	0.62	0.87		0.88	0.48		0.77	0.76		0.24	0.69	0.15
Control Delay	38.2	63.3		76.1	51.3		93.9	40.0		79.3	46.8	10.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.2	63.3		76.1	51.3		93.9	40.0		79.3	46.8	10.5

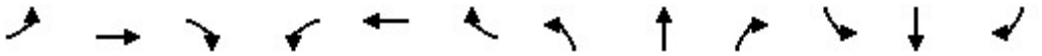
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	E		E	D		F	D		E	D	B
Approach Delay		57.6			59.4			45.8			43.1	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	168	420		167	203		154	587		23	445	31
Queue Length 95th (ft)	214	469		#273	246		#261	#818		55	576	73
Internal Link Dist (ft)		2026			1707			1116			962	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	513	1148		267	924		206	1642		132	1354	1026
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.72		0.79	0.47		0.73	0.76		0.17	0.69	0.13

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 35 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 50.2 Intersection LOS: D
Intersection Capacity Utilization 86.0% ICU Level of Service E
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 9: SW Cary Parkway & Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	455	185	193	590	66	243	1094	140	24	1079	215
Future Volume (vph)	251	455	185	193	590	66	243	1094	140	24	1079	215
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.957			0.985			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3387	0	1770	3486	0	1770	3479	0	1770	3539	1583
Flt Permitted	0.104			0.111			0.950			0.950		
Satd. Flow (perm)	194	3387	0	207	3486	0	1770	3479	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		35			7			10				111
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1196			1042	
Travel Time (s)		31.9			27.1			18.1			15.8	
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)	279	506	206	214	656	73	270	1216	156	27	1199	239
Shared Lane Traffic (%)												
Lane Group Flow (vph)	279	712	0	214	729	0	270	1372	0	27	1199	239
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	22.0	40.0		30.0	48.0		25.0	70.0		20.0	65.0	22.0
Total Split (%)	13.8%	25.0%		18.8%	30.0%		15.6%	43.8%		12.5%	40.6%	13.8%
Maximum Green (s)	15.7	33.2		23.6	41.2		18.7	64.3		13.9	59.2	15.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	55.8	36.4		55.8	38.8		24.2	81.0		8.5	60.0	82.0
Actuated g/C Ratio	0.35	0.23		0.35	0.24		0.15	0.51		0.05	0.38	0.51
v/c Ratio	1.19	0.89		0.82	0.86		1.01	0.78		0.29	0.90	0.28
Control Delay	149.8	74.0		66.4	68.1		121.5	37.6		80.9	57.7	12.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	149.8	74.0		66.4	68.1		121.5	37.6		80.9	57.7	12.2

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	E		E	E		F	D		F	E	B
Approach Delay		95.4			67.7			51.4			50.7	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~300	362		164	376		~323	658		28	623	70
Queue Length 95th (ft)	m#345	m407		257	449		#536	797		63	725	128
Internal Link Dist (ft)		2026			1707			1116			962	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	235	798		320	941		268	1766		165	1327	865
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.19	0.89		0.67	0.77		1.01	0.78		0.16	0.90	0.28

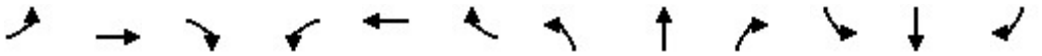
Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 137 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 120			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.19			
Intersection Signal Delay: 62.9		Intersection LOS: E	
Intersection Capacity Utilization 92.3%		ICU Level of Service F	
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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SW Cary Parkway & Old Apex Road

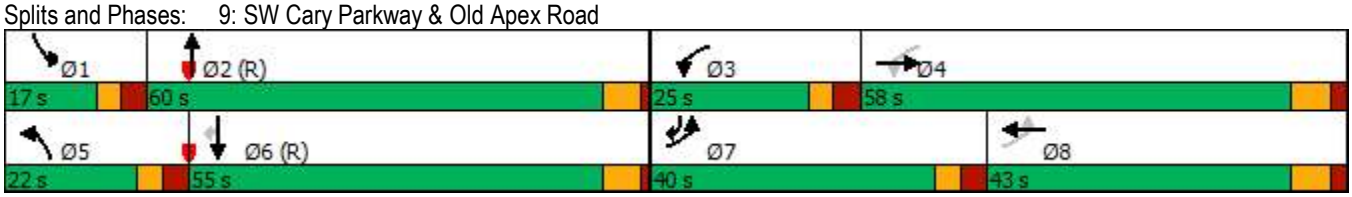


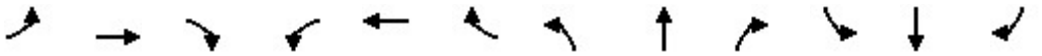
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	216	549	194	191	373	22	136	938	178	20	846	117
Future Volume (vph)	216	549	194	191	373	22	136	938	178	20	846	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.961			0.992			0.976				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3401	0	1770	3511	0	1770	3454	0	1770	3539	1583
Flt Permitted	0.346			0.092			0.950			0.950		
Satd. Flow (perm)	645	3401	0	171	3511	0	1770	3454	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		33			3			15				68
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1196			1042	
Travel Time (s)		31.9			27.1			18.1			15.8	
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)	240	610	216	212	414	24	151	1042	198	22	940	130
Shared Lane Traffic (%)												
Lane Group Flow (vph)	240	826	0	212	438	0	151	1240	0	22	940	130
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	40.0	58.0		25.0	43.0		22.0	60.0		17.0	55.0	40.0
Total Split (%)	25.0%	36.3%		15.6%	26.9%		13.8%	37.5%		10.6%	34.4%	25.0%
Maximum Green (s)	33.7	51.2		18.6	36.2		15.7	54.3		10.9	49.2	33.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	61.3	43.6		61.3	41.3		17.7	75.7		8.3	61.0	86.1
Actuated g/C Ratio	0.38	0.27		0.38	0.26		0.11	0.47		0.05	0.38	0.54
v/c Ratio	0.62	0.87		0.88	0.48		0.77	0.76		0.24	0.70	0.15
Control Delay	38.1	63.3		76.7	51.2		93.7	40.1		79.3	47.0	10.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.1	63.3		76.7	51.2		93.7	40.1		79.3	47.0	10.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	D	E		E	D		F	D		E	D	B
Approach Delay		57.6			59.6			45.9			43.3	
Approach LOS		E			E			D			D	
Queue Length 50th (ft)	168	421		168	203		154	587		23	446	31
Queue Length 95th (ft)	213	470		#274	247		#264	#820		55	576	73
Internal Link Dist (ft)		2026			1707			1116			962	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	513	1148		267	926		206	1641		132	1350	1024
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.47	0.72		0.79	0.47		0.73	0.76		0.17	0.70	0.13

Intersection Summary			
Area Type:	Other		
Cycle Length: 160			
Actuated Cycle Length: 160			
Offset: 35 (22%), Referenced to phase 2:NBT and 6:SBT, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 50.3		Intersection LOS: D	
Intersection Capacity Utilization 86.1%		ICU Level of Service E	
Analysis Period (min) 15			
# 95th percentile volume exceeds capacity, queue may be longer.			
Queue shown is maximum after two cycles.			

Splits and Phases: 9: SW Cary Parkway & Old Apex Road





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	254	458	190	193	593	66	248	1094	140	25	1079	218
Future Volume (vph)	254	458	190	193	593	66	248	1094	140	25	1079	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	350		0	300		0	275		0	0		100
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	100			100			100			100		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.956			0.985			0.983				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3383	0	1770	3486	0	1770	3479	0	1770	3539	1583
Flt Permitted	0.104			0.110			0.950			0.950		
Satd. Flow (perm)	194	3383	0	205	3486	0	1770	3479	0	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		36			7			10				111
Link Speed (mph)		45			45			45			45	
Link Distance (ft)		2106			1787			1196			1042	
Travel Time (s)		31.9			27.1			18.1			15.8	
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)	282	509	211	214	659	73	276	1216	156	28	1199	242
Shared Lane Traffic (%)												
Lane Group Flow (vph)	282	720	0	214	732	0	276	1372	0	28	1199	242
Turn Type	D.P+P	NA		D.P+P	NA		Prot	NA		Prot	NA	pm+ov
Protected Phases	7	4		3	8		5	2		1	6	7
Permitted Phases	8			4								6
Detector Phase	7	4		3	8		5	2		1	6	7
Switch Phase												
Minimum Initial (s)	7.0	7.0		7.0	7.0		7.0	12.0		7.0	12.0	7.0
Minimum Split (s)	13.3	13.8		13.4	13.8		13.3	17.7		13.1	17.8	13.3
Total Split (s)	22.0	40.0		30.0	48.0		25.0	70.0		20.0	65.0	22.0
Total Split (%)	13.8%	25.0%		18.8%	30.0%		15.6%	43.8%		12.5%	40.6%	13.8%
Maximum Green (s)	15.7	33.2		23.6	41.2		18.7	64.3		13.9	59.2	15.7
Yellow Time (s)	3.0	4.6		3.0	4.6		3.0	4.4		3.0	4.4	3.0
All-Red Time (s)	3.3	2.2		3.4	2.2		3.3	1.3		3.1	1.4	3.3
Lost Time Adjust (s)	-1.3	-1.8		-1.4	-1.8		-1.3	-0.7		-1.1	-0.8	-1.3
Total Lost Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	1.0	1.0		1.0	1.0		1.0	6.0		1.0	6.0	1.0
Minimum Gap (s)	1.0	1.0		1.0	1.0		1.0	3.0		1.0	3.0	1.0
Time Before Reduce (s)	0.0	0.0		0.0	0.0		0.0	15.0		0.0	15.0	0.0
Time To Reduce (s)	0.0	0.0		0.0	0.0		0.0	30.0		0.0	30.0	0.0
Recall Mode	None	None		None	None		None	C-Max		None	C-Max	None
Act Effct Green (s)	56.0	36.7		56.0	39.0		24.0	80.8		8.5	60.0	82.0
Actuated g/C Ratio	0.35	0.23		0.35	0.24		0.15	0.50		0.05	0.38	0.51
v/c Ratio	1.20	0.90		0.82	0.86		1.04	0.78		0.30	0.90	0.28
Control Delay	150.5	72.7		66.7	67.8		129.0	37.9		81.2	57.7	12.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	150.5	72.7		66.7	67.8		129.0	37.9		81.2	57.7	12.4

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	F	E		E	E		F	D		F	E	B
Approach Delay		94.6			67.6			53.1			50.7	
Approach LOS		F			E			D			D	
Queue Length 50th (ft)	~305	366		164	376		~343	664		29	623	72
Queue Length 95th (ft)	m#325	m393		257	451		#551	797		64	725	131
Internal Link Dist (ft)		2026			1707			1116			962	
Turn Bay Length (ft)	350			300			275					100
Base Capacity (vph)	235	803		320	941		265	1760		165	1327	865
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	1.20	0.90		0.67	0.78		1.04	0.78		0.17	0.90	0.28

Intersection Summary

Area Type: Other
Cycle Length: 160
Actuated Cycle Length: 160
Offset: 137 (86%), Referenced to phase 2:NBT and 6:SBT, Start of Green
Natural Cycle: 110
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.20
Intersection Signal Delay: 63.3 Intersection LOS: E
Intersection Capacity Utilization 92.8% ICU Level of Service F
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.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 9: SW Cary Parkway & Old Apex Road

APPENDIX I

CAPACITY ANALYSIS CALCULATIONS

Laura Duncan Road

&

Access B

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	4	64	162	4
Future Vol, veh/h	4	4	4	64	162	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	4	4	4	71	180	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	261	182	184	0	-	0
Stage 1	182	-	-	-	-	-
Stage 2	79	-	-	-	-	-
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	728	861	1391	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	944	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	726	861	1391	-	-	-
Mov Cap-2 Maneuver	726	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1391	-	788	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	4	61	149	5
Future Vol, veh/h	4	4	4	61	149	5
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	4	4	4	68	166	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	245	169	172	0	-	0
Stage 1	169	-	-	-	-	-
Stage 2	76	-	-	-	-	-
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	743	875	1405	-	-	-
Stage 1	861	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	741	875	1405	-	-	-
Mov Cap-2 Maneuver	741	-	-	-	-	-
Stage 1	858	-	-	-	-	-
Stage 2	947	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1405	-	802	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	4	64	162	4
Future Vol, veh/h	4	4	4	64	162	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	4	4	4	71	180	4

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	261	182	184	0	-	0
Stage 1	182	-	-	-	-	-
Stage 2	79	-	-	-	-	-
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	728	861	1391	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	944	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	726	861	1391	-	-	-
Mov Cap-2 Maneuver	726	-	-	-	-	-
Stage 1	846	-	-	-	-	-
Stage 2	944	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1391	-	788	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	4	4	63	151	5
Future Vol, veh/h	4	4	4	63	151	5
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	4	4	4	70	168	6

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	249	171	174	0	-	0
Stage 1	171	-	-	-	-	-
Stage 2	78	-	-	-	-	-
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	739	873	1403	-	-	-
Stage 1	859	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	737	873	1403	-	-	-
Mov Cap-2 Maneuver	737	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1403	-	799	-	-
HCM Lane V/C Ratio	0.003	-	0.011	-	-
HCM Control Delay (s)	7.6	0	9.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

APPENDIX J

CAPACITY ANALYSIS CALCULATIONS

Candun Drive

&

Access C

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	29	4	4	31	4	4	4	9	13	4	4
Future Vol, veh/h	4	29	4	4	31	4	4	4	9	13	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	-	-	-	-	-	-	-	-	-	-	-	-
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	32	4	4	34	4	4	4	10	14	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	38	0	0	36	0	0	90	88	34	93	88	36
Stage 1	-	-	-	-	-	-	42	42	-	44	44	-
Stage 2	-	-	-	-	-	-	48	46	-	49	44	-
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	1572	-	-	1575	-	-	895	802	1039	891	802	1037
Stage 1	-	-	-	-	-	-	972	860	-	970	858	-
Stage 2	-	-	-	-	-	-	965	857	-	964	858	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1572	-	-	1575	-	-	883	797	1039	875	797	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	883	797	-	875	797	-
Stage 1	-	-	-	-	-	-	969	857	-	967	855	-
Stage 2	-	-	-	-	-	-	953	854	-	947	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.7	8.9	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	934	1572	-	-	1575	-	-	885
HCM Lane V/C Ratio	0.02	0.003	-	-	0.003	-	-	0.026
HCM Control Delay (s)	8.9	7.3	0	-	7.3	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	24	4	8	23	12	4	4	5	7	4	4
Future Vol, veh/h	4	24	4	8	23	12	4	4	5	7	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	-	-	-	-	-	-	-	-	-	-	-	-
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	27	4	9	26	13	4	4	6	8	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	31	0	0	92	94	29	93	90	33
Stage 1	-	-	-	-	-	-	37	37	-	51	51	-
Stage 2	-	-	-	-	-	-	55	57	-	42	39	-
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	1571	-	-	1582	-	-	892	796	1046	891	800	1041
Stage 1	-	-	-	-	-	-	978	864	-	962	852	-
Stage 2	-	-	-	-	-	-	957	847	-	972	862	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1571	-	-	1582	-	-	879	789	1046	877	793	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	879	789	-	877	793	-
Stage 1	-	-	-	-	-	-	975	861	-	959	847	-
Stage 2	-	-	-	-	-	-	942	842	-	959	859	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.4	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1571	-	-	1582	-	-	889
HCM Lane V/C Ratio	0.016	0.003	-	-	0.006	-	-	0.019
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	29	4	4	31	4	4	4	9	13	4	4
Future Vol, veh/h	4	29	4	4	31	4	4	4	9	13	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	-	-	-	-	-	-	-	-	-	-	-	-
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	32	4	4	34	4	4	4	10	14	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	38	0	0	36	0	0	90	88	34	93	88	36
Stage 1	-	-	-	-	-	-	42	42	-	44	44	-
Stage 2	-	-	-	-	-	-	48	46	-	49	44	-
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	1572	-	-	1575	-	-	895	802	1039	891	802	1037
Stage 1	-	-	-	-	-	-	972	860	-	970	858	-
Stage 2	-	-	-	-	-	-	965	857	-	964	858	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1572	-	-	1575	-	-	883	797	1039	875	797	1037
Mov Cap-2 Maneuver	-	-	-	-	-	-	883	797	-	875	797	-
Stage 1	-	-	-	-	-	-	969	857	-	967	855	-
Stage 2	-	-	-	-	-	-	953	854	-	947	855	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.7	8.9	9.2
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	934	1572	-	-	1575	-	-	885
HCM Lane V/C Ratio	0.02	0.003	-	-	0.003	-	-	0.026
HCM Control Delay (s)	8.9	7.3	0	-	7.3	0	-	9.2
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.1

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	24	4	8	23	12	4	4	5	7	4	4
Future Vol, veh/h	4	24	4	8	23	12	4	4	5	7	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	-	-	-	-	-	-	-	-	-	-	-	-
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	27	4	9	26	13	4	4	6	8	4	4

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	39	0	0	31	0	0	92	94	29	93	90	33
Stage 1	-	-	-	-	-	-	37	37	-	51	51	-
Stage 2	-	-	-	-	-	-	55	57	-	42	39	-
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	1571	-	-	1582	-	-	892	796	1046	891	800	1041
Stage 1	-	-	-	-	-	-	978	864	-	962	852	-
Stage 2	-	-	-	-	-	-	957	847	-	972	862	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1571	-	-	1582	-	-	879	789	1046	877	793	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-	879	789	-	877	793	-
Stage 1	-	-	-	-	-	-	975	861	-	959	847	-
Stage 2	-	-	-	-	-	-	942	842	-	959	859	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	1.4	9.1	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	903	1571	-	-	1582	-	-	889
HCM Lane V/C Ratio	0.016	0.003	-	-	0.006	-	-	0.019
HCM Control Delay (s)	9.1	7.3	0	-	7.3	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.1

APPENDIX K

CAPACITY ANALYSIS CALCULATIONS

Candun Drive

&

Access D

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	4	31	4	4	39
Future Vol, veh/h	13	4	31	4	4	39
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	14	4	34	4	4	43

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	36	0	0	38	0
Stage 1	36	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	914	1037	-	-	1572	-
Stage 1	986	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	911	1037	-	-	1572	-
Mov Cap-2 Maneuver	911	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1572	-
HCM Lane V/C Ratio	-	-	0.02	0.003	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	4	32	12	4	27
Future Vol, veh/h	7	4	32	12	4	27
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	36	13	4	30

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	81	43	0	0	49	0
Stage 1	43	-	-	-	-	-
Stage 2	38	-	-	-	-	-
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	921	1027	-	-	1558	-
Stage 1	979	-	-	-	-	-
Stage 2	984	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	1027	-	-	1558	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	981	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	955	1558	-
HCM Lane V/C Ratio	-	-	0.013	0.003	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	13	4	31	4	4	39
Future Vol, veh/h	13	4	31	4	4	39
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	14	4	34	4	4	43

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	87	36	0	0	38	0
Stage 1	36	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	914	1037	-	-	1572	-
Stage 1	986	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	911	1037	-	-	1572	-
Mov Cap-2 Maneuver	911	-	-	-	-	-
Stage 1	986	-	-	-	-	-
Stage 2	968	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	938	1572	-
HCM Lane V/C Ratio	-	-	0.02	0.003	-
HCM Control Delay (s)	-	-	8.9	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	7	4	32	12	4	27
Future Vol, veh/h	7	4	32	12	4	27
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	36	13	4	30

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	81	43	0	0	49	0
Stage 1	43	-	-	-	-	-
Stage 2	38	-	-	-	-	-
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	921	1027	-	-	1558	-
Stage 1	979	-	-	-	-	-
Stage 2	984	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	918	1027	-	-	1558	-
Mov Cap-2 Maneuver	918	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	981	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	955	1558	-
HCM Lane V/C Ratio	-	-	0.013	0.003	-
HCM Control Delay (s)	-	-	8.8	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

APPENDIX L

CAPACITY ANALYSIS CALCULATIONS

N. Salem Street

&

Access E

Intersection	
Int Delay, s/veh	0.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	549	4	5	437	4	4
Future Vol, veh/h	549	4	5	437	4	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	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	610	4	6	486	4	4

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	614	0	1110	612
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	498	-
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	-	-	965	-	232	493
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	965	-	231	493
Mov Cap-2 Maneuver	-	-	-	-	366	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.8
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	420	-	-	965	-
HCM Lane V/C Ratio	0.021	-	-	0.006	-
HCM Control Delay (s)	13.8	-	-	8.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	543	16	32	559	18	33
Future Vol, veh/h	543	16	32	559	18	33
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	603	18	36	621	20	37

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	621	0	1305	612
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	693	-
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	-	-	960	-	177	493
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	496	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	960	-	170	493
Mov Cap-2 Maneuver	-	-	-	-	309	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	478	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	15.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	-	-	960	-
HCM Lane V/C Ratio	0.139	-	-	0.037	-
HCM Control Delay (s)	15.3	-	-	8.9	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

RAMEY KEMP ASSOCIATES
Moving forward.

T 919 872 5115
5808 Faringdon Place
Raleigh, NC 27609

December 1, 2021

Jess Achenbach
Castle Development Partners
230 Court Square, Suite 202
Charlottesville, VA 22902
P: 434.260.6628
E: jachenbach@castledp.com

Subject: **Trip Generation Comparison Letter** – Laura Duncan Road Development
Apex, North Carolina

Dear Mr. Achenbach:

This letter provides an estimate of the trip generation for the proposed Laura Duncan Road development located north of N. Salem Street / Old Apex Road on both sides of Laura Duncan Road in Apex, North Carolina. The purpose of this letter is to compare the site trips associated with the allowable land uses under the current zoning (Planned Commercial) versus the site trips associated with the future land use (high density residential) under the proposed zoning (Planned Unit Development) for all parcels north of N. Salem Street / Old Apex Road to illustrate that the proposed development is expected to generate fewer site trips with the future land uses associated with the rezoning.

Under the proposed zoning (Planned Unit Development), the proposed development is assumed to consist of approximately 240 apartment units for all parcels north of N. Salem Street / Old Apex Road. Assuming current setbacks and buffers with a consistent internal drive aisle, the maximum building footprint for the allowable land uses under the current zoning (Planned Commercial) for all parcels north of N. Salem Street / Old Apex Road inside the parking boundary is approximately 88,000 square feet. Based on a maximum height of 75 feet (5 stories), the total building square footage for the allowable land uses under the current zoning is approximately 440,000 square feet. For the purposes of this letter, 5-story buildings with general retail space on the ground floor (total of 88,000 square feet) and general office space on the remaining 4 stories (total of 352,000 square feet) were assumed for all parcels north of N. Salem Street / Old Apex Road.

Trip Generation

Average daily traffic and weekday AM and PM peak hour trips for the land uses associated with the development's current and proposed zoning were estimated using the methodology contained within the ITE *Trip Generation Manual*, 10th Edition. Table 1 provides a comparison of the trip generation potential for the land uses associated with the development's current and proposed zoning based on ITE LUC 220 (Multifamily Housing (Low-Rise)), ITE LUC 710 (General Office Building) and ITE LUC 820 (Shopping Center) trip generation equations.

Table 1: Trip Generation Summary

SCENARIO	LAND USE (ITE CODE)	INTENSITY	DAILY TRAFFIC (VPD)	AM PEAK HOUR TRIPS (VPH)		PM PEAK HOUR TRIPS (VPH)	
				ENTER	EXIT	ENTER	EXIT
Current Zoning *(Planned Commercial)*	General Office Building (710)	352,000 SF	3,598	442	61	81	372
	Retail (820)	88,000 SF	5,512	51^	32^	237	257
	Total Trips		**9,110**	**493**	**93**	**318**	**629**
	Pass-By Trips: Retail (LUC 820) [0% AM, 34% PM]			*-0*	*-0*	*-84*	*-84*
	Total External Trips			**493**	**93**	**234**	**545**
Proposed Zoning *(Planned Unit Development)*	Multifamily Housing (Low-Rise) (220)	240 units	1,774	25	85	81	48
Difference (Combined Office and Retail)			**7,336**	**468**	**8**	**153**	**497**
Difference (Office Only)			**1,824**	**417**	**-24**	**0**	**324**
Difference (Retail Only)			**3,738**	**26**	**-53**	**72**	**125**

^Rates were used instead of equations for generating AM peak hour trips

As shown in Table 1, based on the ITE *Trip Generation Manual*, 10th Edition, it is estimated that the combination of office and retail allowable land uses under the current zoning (Planned Commercial) could generate approximately 7,336 additional daily trips on the roadway network during a typical 24-hour weekday period in comparison with the future land use (high density residential) under the proposed zoning (Planned Unit Development) for all parcels north of N. Salem Street / Old Apex Road. Of the daily traffic volume, it is anticipated that an additional 476 total trips (468 entering and 8 exiting) will occur during the weekday AM peak hour and an additional 650 total trips (153 entering and 497 exiting) will occur during the weekday PM peak hour after the reduction for pass-by trips.

If only the office allowable land use under the current zoning was developed by-right, as shown in Table 1, it is estimated that the development could generate approximately 1,824 additional daily trips on the roadway network during a typical 24-hour weekday period in comparison with the future land use (high density residential) under the proposed zoning. Of the daily traffic volume, it is anticipated that an additional 393 total trips (417 entering and -24 exiting) will occur during the weekday AM peak hour and an additional 324 total trips (0 entering and 324 exiting) will occur during the weekday PM peak hour.

If only the retail allowable land use under the current zoning was developed by-right, as shown in Table 1, it is estimated that the development could generate approximately 3,728 additional daily trips on the roadway network during a typical 24-hour weekday period in comparison with the future land use (high density residential) under the proposed zoning. Of the daily traffic volume, it is anticipated that 27 fewer total trips (26 entering and -53 exiting) will occur during the weekday AM peak hour and an additional 197 total trips (72 entering and 125 exiting) will occur during the weekday PM peak hour after the reduction for pass-by trips.

Findings and Summary

The calculations provided in this letter are estimations of the trip generation potential for the proposed site based on data from the ITE *Trip Generation Manual*, 10th Edition. Based on the trip generation results, the future land use (high density residential) under the proposed zoning (Planned Unit Development) for all parcels north of N. Salem Street / Old Apex Road is expected to generate significantly fewer trips in comparison to the allowable land uses under the current zoning (Planned Commercial) and will therefore have a lesser impact on the surrounding roadway network with the rezoning with one exception. If only the retail allowable land use under the current zoning was developed by-right, it is anticipated that approximately 27 fewer total trips will occur during the weekday AM peak hour. This is not uncommon for general retail/shopping center land uses which typically generate fewer site trips in the morning but experience a relatively uniform distribution of site traffic through a typical weekday.

If you should have any questions, please feel free to contact me at (919) 872-5115.

Sincerely,

Michael Karpinski, P.E.
Traffic Engineering Project Manager
Ramey Kemp Associates

12/1/2021

NC Corporate License # C-0910

PLANNING BOARD REPORT TO TOWN COUNCIL

Rezoning Case: 21CZ29 North Salem Station PUD

Planning Board Meeting Date: April 11, 2022

Report Requirements:

Per NCGS §160D-604(b), all proposed amendments to the zoning ordinance or zoning map shall be submitted to the Planning Board for review and comment. If no written report is received from the Planning Board within 30 days of referral of the amendment to the Planning Board, the Town Council may act on the amendment without the Planning Board report. The Town Council is not bound by the recommendations, if any, of the Planning Board.

Per NCGS §160D-604(d), the Planning Board shall advise and comment on whether the proposed action 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:	+/- 10.39
PIN(s):	0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, and 0713908968
Current Zoning:	Planned Commercial (7 parcels) and Neighborhood Business (2 parcels)
Proposed Zoning:	Planned Unit Development-Conditional Zoning
2045 Land Use Map:	High Density Residential (Apartments Only)/Commercial Services and High Density Residential/Office Employment
Town Limits:	Inside Corporate Limits

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: _____

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: _____

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: _____

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: _____

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: _____

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 Recommendation:

Motion: To recommend approval as presented.

Introduced by Planning Board member: Mark Steele

Seconded by Planning Board member: Ryan Akers

☐ *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:

Conditions proposed by the applicant.

☐ *Denial*: the project is not consistent with all applicable officially adopted plans and/or the applicable legislative considerations as noted above.

With 4 Planning Board Member(s) voting "aye"

With 3 Planning Board Member(s) voting "no"

Reasons for dissenting votes:

Elaine Boyle, Tim Royal, and Keith Braswell voted no for the following reasons: Parking ratio too low, traffic in area is dangerous, density proposed is too high, RCA across North Salem Street, versus "on-site", intersection improvements needed for children walking to school.

This report reflects the recommendation of the Planning Board, this the 11th day of April 2022.

Attest:

Reginald Skinner, Planning Board Chair

Dianne Khin Digitally signed by Dianne Khin Date: 2022.04.11 19:04:26 -04'00'

Dianne Khin, Director of Planning and Community Development

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919 249 3426

PUBLIC NOTIFICATION OF PUBLIC HEARINGS
CONDITIONAL ZONING #21CZ29
North Salem Station PUD

Pursuant to the provisions of North Carolina General Statutes §1600-602 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 of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Ana Wadsworth, The Wooten Company
Authorized Agent: Jeff Shifflett, Castle Development Partners
Property Addresses: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Acreage: ±10.39 acres
Property Identification Numbers (PINs): 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
2045 Land Use Map Designation: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Existing Zoning of Properties: Planned Commercial (PC) & Neighborhood Business (B1)
Proposed Zoning of Properties: Planned Unit Development-Conditional Zoning (PUD-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Planning Board Public Hearing Date and Time: April 11, 2022 4:30 PM

You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov. Please visit www.apexnc.org on the day of the meeting to confirm whether the meeting will be held in-person or remotely.

If you are unable to attend, you may provide a written statement by email to public.hearing@apexnc.org, or submit it to the clerk of the Planning Board, Jeri Pederson (73 Hunter Street or USPS mail - P.O. Box 250, Apex, NC 27502), at least two business days prior to the Planning Board vote. You must provide your name and address for the record. The written statements will be delivered to the Planning Board prior to their vote. Please include the Public Hearing name in the subject line.

In the event that the Planning Board meeting is held remotely or with at least one member attending virtually, written comments may be submitted up to 24 hours prior to the scheduled time of the meeting per NCGS §166A-19.24 according to the methods specified above. Virtual meetings may be viewed via the Town's YouTube livestream at https://www.youtube.com/c/townofapexgov.

A separate notice of the Town Council public hearing on this project will be mailed and posted in order to comply with State public notice requirements.

Vicinity Map:

Property owners, tenants, and neighborhood associations within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: March 25 – April 11, 2022

TOWN OF APEX
PO BOX 250
APEX, NORTH CAROLINA 27502
TELÉFONO 919-249-3426

NOTIFICACIÓN PÚBLICA DE AUDIENCIAS PÚBLICAS
ORDENAMIENTO TERRITORIAL CONDICIONAL #21CZ29
North Salem Station PUD (Desarrollo de Unidad Planificada)

De conformidad con las disposiciones de los Estatutos Generales de Carolina del Norte §160D-602 y con la Sección 2.2.11 de la Ordenanza de Desarrollo Unificado (UDO) del ayuntamiento de Apex, por la presente se notifican las audiencias públicas ante la Junta de Planificación de Apex. El propósito de estas audiencias es considerar lo siguiente:

Solicitante: Ana Wadsworth, The Wooten Company
Agente autorizado: Jeff Shifflett, Castle Development Partners
Dirección de las propiedades: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Superficie: ±10.39 acres
Números de identificación de las propiedades: 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
Designación actual en el Mapa de Uso Territorial para 2045: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Ordenamiento territorial existente de las propiedades: Planned Commercial (PC) & Neighborhood Business (B1)
Ordenamiento territorial propuesto para las propiedades: Planned Unit Development-Conditional Zoning (PUD-CZ)

Lugar de la audiencia pública: Ayuntamiento de Apex
Cámara del Consejo, 2º piso
73 Hunter Street, Apex, Carolina del Norte

Fecha y hora de la audiencia pública de la Junta de Planificación: 11 de abril de 2022 4:30 P.M.

Puede asistir a la reunión de manera presencial o seguir la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov. Por favor visite www.apexnc.org el día de la reunión para confirmar si la reunión se llevará a cabo de manera presencial o remotamente.

Si no puede asistir, puede enviar una declaración escrita por correo electrónico a public.hearing@apexnc.org, o presentarla a la secretaría de la Junta de Planificación, Jeri Pederson (73 Hunter Street o por correo USPS a P.O. Box 250, Apex, NC 27502), al menos dos días hábiles antes de la votación de la Junta de Planificación. Debe proporcionar su nombre y dirección para que conste en el registro. Las declaraciones escritas se entregarán a la Junta de Planificación antes de la votación. No olvide incluir el nombre de la audiencia pública en el asunto.

En caso de que la reunión de la Junta de Planificación se lleve a cabo remotamente o que por lo menos uno de los miembros asista virtualmente, se permite presentar comentarios por escrito hasta 24 horas antes de la hora programada de la reunión según los estatutos de Carolina del Norte NCGS §166A-19.24 siguiendo los métodos especificados anteriormente. Las reuniones virtuales se pueden seguir en la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

De conformidad con los requisitos estatales de notificaciones públicas, se enviará por correo y se publicará por separado una notificación de la audiencia pública del Consejo Municipal sobre este proyecto.

Mapa de las inmediaciones:

Los propietarios, inquilinos y asociaciones de vecinos en un radio de 300 pies del Ordenamiento Territorial Condicional propuesto han recibido esta notificación por correo postal de primera clase. Todas las partes interesadas pueden presentar comentarios sobre la solicitud a través de los medios especificados anteriormente. La ubicación de la propiedad también puede verse aquí: https://maps.raleighnc.gov/imaps. Puede ver el Mapa de Uso Territorial para 2045 aquí: www.apexnc.org/DocumentCenter/View/478. Si tiene preguntas o desea obtener más información, puede comunicarse con el Departamento de Planificación y Desarrollo Comunitario al 919-249-3426. Puede ver la solicitud y otros documentos relacionados aquí: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29

Dianne F. Khin, AICP
Directora de Planificación y Desarrollo Comunitario

Fechas de publicación: 25 de marzo - 11 de abril de 2022

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF PUBLIC HEARINGS

CONDITIONAL ZONING #21CZ29
North Salem Station PUD

Pursuant to the provisions of North Carolina General Statutes §160D-602 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 of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Ana Wadsworth, The Wooten Company
Authorized Agent: Jeff Shifflett, Castle Development Partners
Property Addresses: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Acreage: ±10.39 acres
Property Identification Numbers (PINs): 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
2045 Land Use Map Designation: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Existing Zoning of Properties: Planned Commercial (PC) & Neighborhood Business (B1)
Proposed Zoning of Properties: Planned Unit Development-Conditional Zoning (PUD-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Planning Board Public Hearing Date and Time: April 11, 2022 4:30 PM

You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov. Please visit www.apexnc.org on the day of the meeting to confirm whether the meeting will be held in-person or remotely.

If you are unable to attend, you may provide a written statement by email to public.hearing@apexnc.org, or submit it to the clerk of the Planning Board, Jeri Pederson (73 Hunter Street or USPS mail - P.O. Box 250, Apex, NC 27502), at least two business days prior to the Planning Board vote. You must provide your name and address for the record. The written statements will be delivered to the Planning Board prior to their vote. Please include the Public Hearing name in the subject line.

In the event that the Planning Board meeting is held remotely or with at least one member attending virtually, written comments may be submitted up to 24 hours prior to the scheduled time of the meeting per NCGS §166A-19.24 according to the methods specified above. Virtual meetings may be viewed via the Town's YouTube livestream at https://www.youtube.com/c/townofapexgov.

A separate notice of the Town Council public hearing on this project will be mailed and posted in order to comply with State public notice requirements.

Vicinity Map:

Property owners, tenants, and neighborhood associations within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: March 25 – April 11, 2022

TOWN OF APEX
PO BOX 250
APEX, NORTH CAROLINA 27502
TELÉFONO 919-249-3426

NOTIFICACIÓN PÚBLICA DE AUDIENCIAS PÚBLICAS

ORDENAMIENTO TERRITORIAL CONDICIONAL #21CZ29
North Salem Station PUD (Desarrollo de Unidad Planificada)

De conformidad con las disposiciones de los Estatutos Generales de Carolina del Norte §160D-602 y con la Sección 2.2.11 de la Ordenanza de Desarrollo Unificado (UDO) del ayuntamiento de Apex, por la presente se notifican las audiencias públicas ante la Junta de Planificación de Apex. El propósito de estas audiencias es considerar lo siguiente:

Solicitante: Ana Wadsworth, The Wooten Company
Agente autorizado: Jeff Shifflett, Castle Development Partners
Dirección de las propiedades: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Superficie: ±10.39 acres
Números de identificación de las propiedades: 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
Designación actual en el Mapa de Uso Territorial para 2045: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Ordenamiento territorial existente de las propiedades: Planned Commercial (PC) & Neighborhood Business (B1)
Ordenamiento territorial propuesto para las propiedades: Planned Unit Development-Conditional Zoning (PUD-CZ)

Lugar de la audiencia pública: Ayuntamiento de Apex
Cámara del Consejo, 2º piso
73 Hunter Street, Apex, Carolina del Norte

Fecha y hora de la audiencia pública de la Junta de Planificación: 11 de abril de 2022 4:30 P.M.

Puede asistir a la reunión de manera presencial o seguir la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov. Por favor visite www.apexnc.org el día de la reunión para confirmar si la reunión se llevará a cabo de manera presencial o remotamente.

Si no puede asistir, puede enviar una declaración escrita por correo electrónico a public.hearing@apexnc.org, o presentarla a la secretaría de la Junta de Planificación, Jeri Pederson (73 Hunter Street o por correo USPS a P.O. Box 250, Apex, NC 27502), al menos dos días hábiles antes de la votación de la Junta de Planificación. Debe proporcionar su nombre y dirección para que conste en el registro. Las declaraciones escritas se entregarán a la Junta de Planificación antes de la votación. No olvide incluir el nombre de la audiencia pública en el asunto.

En caso de que la reunión de la Junta de Planificación se lleve a cabo remotamente o que por lo menos uno de los miembros asista virtualmente, se permite presentar comentarios por escrito hasta 24 horas antes de la hora programada de la reunión según los estatutos de Carolina del Norte NCGS §166A-19.24 siguiendo los métodos especificados anteriormente. Las reuniones virtuales se pueden seguir en la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

De conformidad con los requisitos estatales de notificaciones públicas, se enviará por correo y se publicará por separado una notificación de la audiencia pública del Consejo Municipal sobre este proyecto.

Mapa de las inmediaciones:

Los propietarios, inquilinos y asociaciones de vecinos en un radio de 300 pies del Ordenamiento Territorial Condicional propuesto han recibido esta notificación por correo postal de primera clase. Todas las partes interesadas pueden presentar comentarios sobre la solicitud a través de los medios especificados anteriormente. La ubicación de la propiedad también puede verse aquí: https://maps.raleighnc.gov/imaps. Puede ver el Mapa de Uso Territorial para 2045 aquí: www.apexnc.org/DocumentCenter/View/478. Si tiene preguntas o desea obtener más información, puede comunicarse con el Departamento de Planificación y Desarrollo Comunitario al 919-249-3426. Puede ver la solicitud y otros documentos relacionados aquí: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29

Dianne F. Khin, AICP
Directora de Planificación y Desarrollo Comunitario

Fechas de publicación: 25 de marzo - 11 de abril de 2022

TOWN OF APEX
POST OFFICE BOX 250
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 Name:	Conditional Zoning #21CZ29 North Salem Station PUD
Project Location:	0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Applicant or Authorized Agent:	Ana Wadsworth
Firm:	The Wooten Company

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on March 25, 2022, 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 and tenants within 300' of the land subject to notification. I further certify that I relied on information from the Wake County Tax Assessor and the Town of Apex Master Address Repository provided to me by Town of Apex GIS Staff as to accuracy of the list and accuracy of mailing addresses of property owners and tenants within 300' of the land subject to notification.

3/28/2022
Date

Director of Planning and Community Development

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 28 day of March, 2022.

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024
SEAL

Jeri Chastain Pederson
Notary Public

My Commission Expires: 3/10/2024

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION
OF PUBLIC HEARINGS
CONDITIONAL ZONING #21CZ29
North Salem Station PUD

Pursuant to the provisions of North Carolina General Statutes §160D-602 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Town Council of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Ana Wadsworth, The Wooten Company
Authorized Agent: Jeff Shifflett, Castle Development Partners
Property Addresses: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Acreage: ±10.39 acres
Property Identification Numbers (PINs): 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
2045 Land Use Map Designation: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Existing Zoning of Properties: Planned Commercial (PC) & Neighborhood Business (B1)
Proposed Zoning of Properties: Planned Unit Development-Conditional Zoning (PUD-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Comments received prior to the Planning Board public hearing will not be provided to the Town Council. Separate comments for the Town Council public hearing must be provided by the deadline specified below.

Town Council Public Hearing Date and Time: May 10, 2022 6:00 PM

You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov.

If you are unable to attend, you may provide a written statement by email to public.hearing@apexnc.org, or submit it to the Office of the Town Clerk (73 Hunter Street or USPS mail - P.O. Box 250, Apex, NC 27502), at least two business days prior to the Town Council vote. You must provide your name and address for the record. The written statements will be delivered to the Town Council members prior to their vote. Please include the Public Hearing name in the subject line.

In the event that the Town Council meeting is held remotely or with at least one member attending virtually, written comments may be submitted up to 24 hours prior to the scheduled time of the meeting per NCGS §166A-19.24 according to the methods specified above. Virtual meetings may be viewed via the Town's YouTube livestream at https://www.youtube.com/c/townofapexgov.

Vicinity Map:

Property owners, tenants, and neighborhood associations within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April 22 – May 10, 2022

TOWN OF APEX
PO BOX 250
APEX, NORTH CAROLINA 27502
TELÉFONO 919-249-3426

NOTIFICACIÓN PÚBLICA DE AUDIENCIAS PÚBLICAS

ORDENAMIENTO TERRITORIAL CONDICIONAL #21CZ29
North Salem Station PUD (Desarrollo de Unidad Planificada)

De conformidad con las disposiciones de los Estatutos Generales de Carolina del Norte §160D-602 y con la Sección 2.2.11 de la Ordenanza de Desarrollo Unificado (UDO) del ayuntamiento de Apex, por la presente se notifican las audiencias públicas ante el Consejo Municipal del Ayuntamiento de Apex. El propósito de estas audiencias es considerar lo siguiente:

Solicitante: Ana Wadsworth, The Wooten Company
Agente autorizado: Jeff Shifflett, Castle Development Partners
Dirección de las propiedades: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Superficie: ±10.39 acres
Números de identificación de las propiedades: 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
Designación actual en el Mapa de Uso Territorial para 2045: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Ordenamiento territorial existente de las propiedades: Planned Commercial (PC) & Neighborhood Business (B1)
Ordenamiento territorial propuesto para las propiedades: Planned Unit Development-Conditional Zoning (PUD-CZ)

Lugar de la audiencia pública: Ayuntamiento de Apex
Cámara del Consejo, 2º piso
73 Hunter Street, Apex, Carolina del Norte

Los comentarios recibidos antes de la audiencia pública de la Junta de Planificación no se proporcionarán al Consejo Municipal. Los comentarios para la audiencia pública del Consejo Municipal deben presentarse por separado en el plazo especificado a continuación.

Fecha y hora de la audiencia pública del Consejo Municipal: 10 de mayo de 2022 6:00 P.M.

Puede asistir a la reunión de manera presencial o seguir la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

Si no puede asistir, puede enviar una declaración escrita por correo electrónico a public.hearing@apexnc.org, o presentarla a la oficina del Secretario Municipal (73 Hunter Street o por correo USPS a P.O. Box 250, Apex, NC 27502), al menos dos días hábiles antes de la votación del Consejo Municipal. Debe proporcionar su nombre y dirección para que conste en el registro. Las declaraciones escritas se entregarán al Consejo Municipal antes de la votación. No olvide incluir el nombre de la audiencia pública en el asunto.

En caso de que la reunión del Consejo Municipal se lleve a cabo remotamente o que por lo menos uno de los miembros asista virtualmente, se permite presentar comentarios por escrito hasta 24 horas antes de la hora programada de la reunión según los estatutos de Carolina del Norte NCGS §166A-19.24 siguiendo los métodos especificados anteriormente. Las reuniones virtuales se pueden seguir en la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

Mapa de las inmediaciones:

Los propietarios, inquilinos y asociaciones de vecinos en un radio de 300 pies del Ordenamiento Territorial Condicional propuesto han recibido esta notificación por correo postal de primera clase. Todas las partes interesadas pueden presentar comentarios sobre la solicitud a través de los medios especificados anteriormente. La ubicación de la propiedad también puede verse aquí: https://maps.raleighnc.gov/imaps. Puede ver el Mapa de Uso Territorial para 2045 aquí: www.apexnc.org/DocumentCenter/View/478. Si tiene preguntas o desea obtener más información, puede comunicarse con el Departamento de Planificación y Desarrollo Comunitario al 919-249-3426. Puede ver la solicitud y otros documentos relacionados aquí: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Directora de Planificación y Desarrollo Comunitario

Fechas de publicación: 22 de abril - 10 de mayo de 2022

TOWN OF APEX
POST OFFICE BOX 250
APEX, NORTH CAROLINA 27502
PHONE 919-249-3426

PUBLIC NOTIFICATION OF PUBLIC HEARINGS

CONDITIONAL ZONING #21CZ29
North Salem Station PUD

Pursuant to the provisions of North Carolina General Statutes §160D-602 and to the Town of Apex Unified Development Ordinance (UDO) Section 2.2.11, notice is hereby given of public hearings before the Town Council of the Town of Apex. The purpose of these hearings is to consider the following:

Applicant: Ana Wadsworth, The Wooten Company
Authorized Agent: Jeff Shifflett, Castle Development Partners
Property Addresses: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Acreage: ±10.39 acres
Property Identification Numbers (PINs): 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
2045 Land Use Map Designation: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Existing Zoning of Properties: Planned Commercial (PC) & Neighborhood Business (B1)
Proposed Zoning of Properties: Planned Unit Development-Conditional Zoning (PUD-CZ)

Public Hearing Location: Apex Town Hall
Council Chamber, 2nd Floor
73 Hunter Street, Apex, North Carolina

Comments received prior to the Planning Board public hearing will not be provided to the Town Council. Separate comments for the Town Council public hearing must be provided by the deadline specified below.

Town Council Public Hearing Date and Time: May 10, 2022 6:00 PM

You may attend the meeting in person or view the meeting through the Town's YouTube livestream at: https://www.youtube.com/c/townofapexgov.

If you are unable to attend, you may provide a written statement by email to public.hearing@apexnc.org, or submit it to the Office of the Town Clerk (73 Hunter Street or USPS mail - P.O. Box 250, Apex, NC 27502), at least two business days prior to the Town Council vote. You must provide your name and address for the record. The written statements will be delivered to the Town Council members prior to their vote. Please include the Public Hearing name in the subject line.

In the event that the Town Council meeting is held remotely or with at least one member attending virtually, written comments may be submitted up to 24 hours prior to the scheduled time of the meeting per NCGS §166A-19.24 according to the methods specified above. Virtual meetings may be viewed via the Town's YouTube livestream at https://www.youtube.com/c/townofapexgov.

Vicinity Map:

Property owners, tenants, and neighborhood associations within 300 feet of the proposed conditional zoning have been sent this notice via first class mail. All interested parties may submit comments with respect to the application by the means specified above. In addition to the above map, the location of the property may be viewed online at https://maps.raleighnc.gov/imaps. The 2045 Land Use Map may be viewed online at www.apexnc.org/DocumentCenter/View/478. You may call 919-249-3426, Department of Planning and Community Development, with questions or for further information. To view the petition and related documents on-line: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Director of Planning and Community Development

Published Dates: April 22 – May 10, 2022

TOWN OF APEX
PO BOX 250
APEX, NORTH CAROLINA 27502
TELÉFONO 919-249-3426

NOTIFICACIÓN PÚBLICA DE AUDIENCIAS PÚBLICAS

ORDENAMIENTO TERRITORIAL CONDICIONAL #21CZ29
North Salem Station PUD (Desarrollo de Unidad Planificada)

De conformidad con las disposiciones de los Estatutos Generales de Carolina del Norte §160D-602 y con la Sección 2.2.11 de la Ordenanza de Desarrollo Unificado (UDO) del ayuntamiento de Apex, por la presente se notifican las audiencias públicas ante el Consejo Municipal del Ayuntamiento de Apex. El propósito de estas audiencias es considerar lo siguiente:

Solicitante: Ana Wadsworth, The Wooten Company
Agente autorizado: Jeff Shifflett, Castle Development Partners
Dirección de las propiedades: 0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Superficie: ±10.39 acres
Números de identificación de las propiedades: 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, & 0743908968
Designación actual en el Mapa de Uso Territorial para 2045: High-Density Residential (apartments only)/Commercial Services and High-Density Residential/Office Employment
Ordenamiento territorial existente de las propiedades: Planned Commercial (PC) & Neighborhood Business (B1)
Ordenamiento territorial propuesto para las propiedades: Planned Unit Development-Conditional Zoning (PUD-CZ)

Lugar de la audiencia pública: Ayuntamiento de Apex
Cámara del Consejo, 2º piso
73 Hunter Street, Apex, Carolina del Norte

Los comentarios recibidos antes de la audiencia pública de la Junta de Planificación no se proporcionarán al Consejo Municipal. Los comentarios para la audiencia pública del Consejo Municipal deben presentarse por separado en el plazo especificado a continuación.

Fecha y hora de la audiencia pública del Consejo Municipal: 10 de mayo de 2022 6:00 P.M.

Puede asistir a la reunión de manera presencial o seguir la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

Si no puede asistir, puede enviar una declaración escrita por correo electrónico a public.hearing@apexnc.org, o presentarla a la oficina del Secretario Municipal (73 Hunter Street o por correo USPS a P.O. Box 250, Apex, NC 27502), al menos dos días hábiles antes de la votación del Consejo Municipal. Debe proporcionar su nombre y dirección para que conste en el registro. Las declaraciones escritas se entregarán al Consejo Municipal antes de la votación. No olvide incluir el nombre de la audiencia pública en el asunto.

En caso de que la reunión del Consejo Municipal se lleve a cabo remotamente o que por lo menos uno de los miembros asista virtualmente, se permite presentar comentarios por escrito hasta 24 horas antes de la hora programada de la reunión según los estatutos de Carolina del Norte NCGS §166A-19.24 siguiendo los métodos especificados anteriormente. Las reuniones virtuales se pueden seguir en la transmisión en directo por YouTube a través del siguiente enlace: https://www.youtube.com/c/townofapexgov.

Mapa de las inmediaciones:

Los propietarios, inquilinos y asociaciones de vecinos en un radio de 300 pies del Ordenamiento Territorial Condicional propuesto han recibido esta notificación por correo postal de primera clase. Todas las partes interesadas pueden presentar comentarios sobre la solicitud a través de los medios especificados anteriormente. La ubicación de la propiedad también puede verse aquí: https://maps.raleighnc.gov/imaps. Puede ver el Mapa de Uso Territorial para 2045 aquí: www.apexnc.org/DocumentCenter/View/478. Si tiene preguntas o desea obtener más información, puede comunicarse con el Departamento de Planificación y Desarrollo Comunitario al 919-249-3426. Puede ver la solicitud y otros documentos relacionados aquí: https://www.apexnc.org/DocumentCenter/View/37713/21CZ29.

Dianne F. Khin, AICP
Directora de Planificación y Desarrollo Comunitario

Fechas de publicación: 22 de abril - 10 de mayo de 2022

TOWN OF APEX
POST OFFICE BOX 250
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 Name:	Conditional Zoning #21CZ29 North Salem Station PUD
Project Location:	0 Candun Dr., 0 Laura Duncan Rd., & 0 N. Salem St.
Applicant or Authorized Agent:	Ana Wadsworth
Firm:	The Wooten Company

This is to certify that I, as Director of Planning and Community Development, mailed or caused to have mailed by first class postage for the above mentioned project on April 22, 2022, 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 and tenants within 300' of the land subject to notification. I further certify that I relied on information from the Wake County Tax Assessor and the Town of Apex Master Address Repository provided to me by Town of Apex GIS Staff as to accuracy of the list and accuracy of mailing addresses of property owners and tenants within 300' of the land subject to notification.

4/22/2022
Date

Director of Planning and Community Development

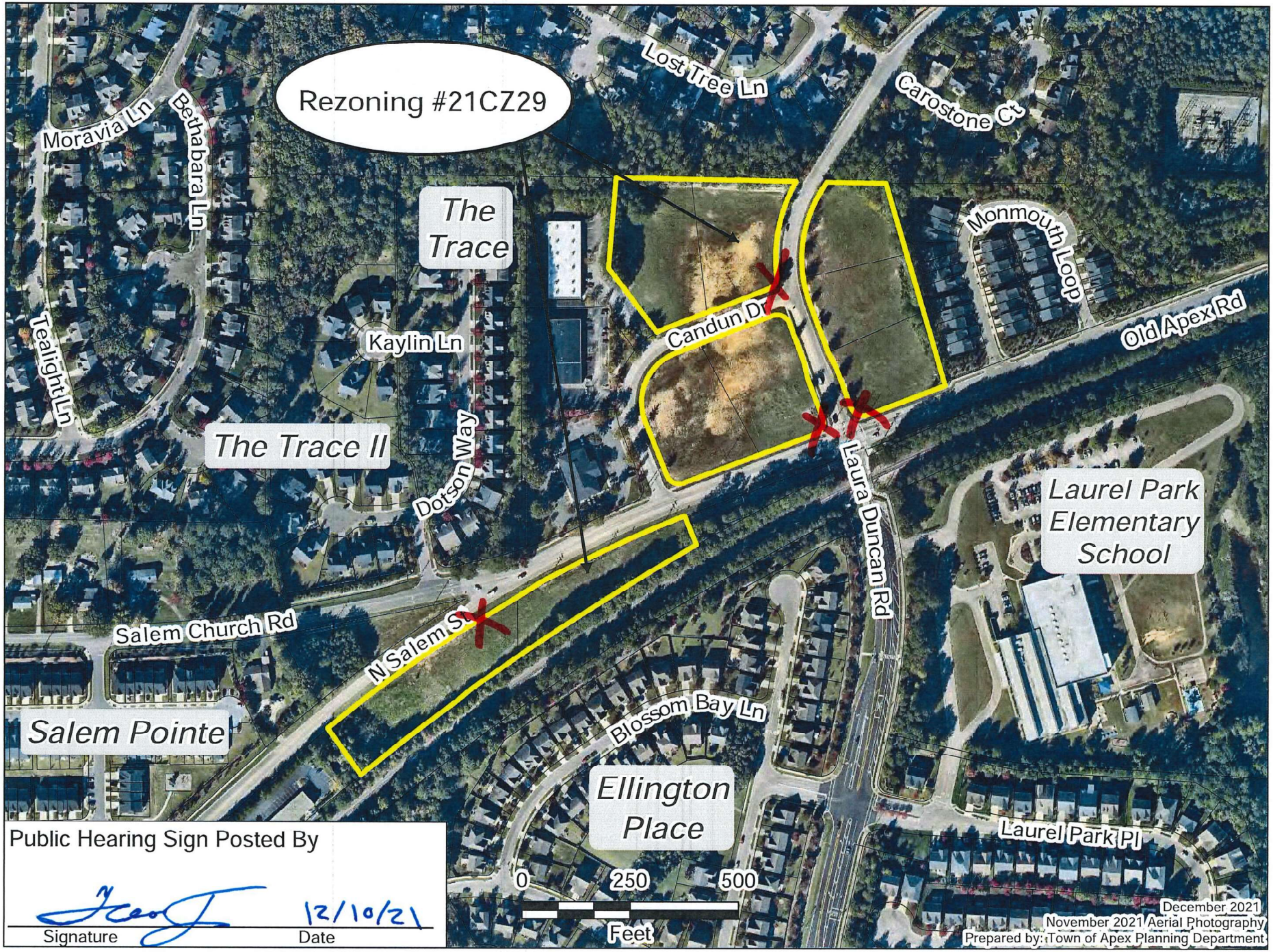
STATE OF NORTH CAROLINA
COUNTY OF WAKE

Sworn and subscribed before me, Jeri Chastain Pederson, a Notary Public for the above State and County, this the 22 day of April, 202 ___.

Notary Public

JERI CHASTAIN PEDERSON
Notary Public
Wake County, North Carolina
My Commission Expires
March 10, 2024

My Commission Expires: 3/10/24



Public Hearing Sign Posted By

12/10/21

Signature Date

WAKE COUNTY PUBLIC SCHOOL SYSTEM

Student Assignment
5625 Dillard Drive
Cary, NC, 27518
Email: studentassignment@wcpss.net

tel: (919) 431-7333
fax: (919) 694-7753

Dear Dianne,

The Wake County Public School System (WCPSS) Office of School Assignment received information about a proposed rezoning/development within the Town of Apex planning area. We are providing this letter to share information about WCPSS's capacity related to the proposal. The following information about the proposed rezoning/development was provided through the Wake County Residential Development Notification database:

- Date of application: December 1, 2021
- Name of development: 21CZ29 N. Salem St Station PUD
- Address of rezoning: 0 Candun Dr, 0 N. Salem St, 0 Laura Duncan Rd (PINs 0753024120, 0753026029, 0753028181, 0753019925, 0753019769, 0753016795, 0753015606, 0753013228, 0743908968)
- Total number of proposed residential units: 240
- Type(s) of residential units proposed: Apartments

Based on the information received at the time of application, the Office of School Assignment is providing the following assessment of possible impacts to the Wake County Public School System:

☑ Schools at all grade levels within the current assignment area for the proposed rezoning/development are anticipated to have sufficient capacity for future students.

☐ Schools at the following grade levels within the current assignment area for the proposed rezoning/development are anticipated to have insufficient capacity for future students; transportation to schools outside of the current assignment area should be anticipated:

☐ Elementary ☐ Middle ☐ High

The following mitigation of capacity concerns due to school construction or expansion is anticipated:

☐ Not applicable – existing school capacity is anticipated to be sufficient.

☐ School expansion or construction within the next five years is not anticipated to address concerns.

☐ School expansion or construction within the next five years may address concerns at these grade levels:

☐ Elementary ☐ Middle ☐ High

Thank you for sharing this information with the Town of Apex Planning Board and Town Council as they consider the proposed rezoning/development.

Sincerely,

Glenn Carrozza