



Research Triangle Logistic Park MPD-CZD

Prepared for:

Terra Equity Inc.
A Division of Barrister Commercial Group
3810 Springhurst Boulevard, Suite 120
Louisville, KY 40241

Prepared by:

Kimley-Horn & Associates, Inc.
421 Fayetteville Street, Suite 600
Raleigh, NC 27601

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1. OVERVIEW AND INTRODUCTON

SECTION 1-1 INTRODUCTION, PURPOSE, AND INTENT

Research Triangle Logistics Park (“RTL”) encompasses 161 acres of land centrally located within the North Carolina Research Triangle and within 20 minutes of the Raleigh Durham Airport. Located in the highly sought after I-40 Corridor, RTL has strategic access to I-40, I-85 and I-95 trucking routes and to FedEx and UPS cargo facilities.

Ready for construction in January 2021, RTL will have the capacity for over 2,250,000 square feet of health technology, information sciences and engineering, advanced manufacturing, light manufacturing, scientific research and laboratories, logistics, warehousing and supply chain fulfillment.

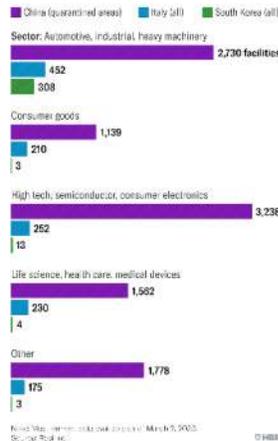
RTL will create facility investment of more than \$150,000,000.00 and will provide employment for up to 4,500 people globally within the Raleigh-Durham MSA and, more specifically, within the Orange County-Town of Hillsborough economic area.

As governments and health care agencies work to stop the spread of Covid-19 and to treat those who are infected, manufacturers in more than a dozen industries are struggling to manage the epidemic’s growing impact on their supply chains. Unfortunately, many are facing a supply crisis that stems from weaknesses in their sourcing strategies that could have been corrected years ago.

Just how extensive the crisis is can be seen in data released by Resilinc, a supply-chain-mapping and risk-monitoring company, which shows the number of sites of industries located in the quarantined areas of China, South Korea, and Italy, and the number of items sourced from the quarantined regions of China.

Dependence on Quarantined Areas

The world’s largest 1,000 companies or their suppliers own more than 12,000 facilities – factories, warehouses, and other operations – in Covid-19 quarantine areas.



The Federal Emergency Management Agency, the U.S. Food and Drug Administration, the National Institutes of Health, and others need a coordinated plan that includes an inventory of supplies and equipment that can be put into service until overseas supply chains are repaired.

For instance, a large domestic stockpile of masks and medical supplies would have bought the U.S. critical time to secure domestic production.

Safety issues are another concern. Some items are best produced domestically. Many prescription and over-the-counter health products that were previously made in the U.S. are today either made in China, or rely on Chinese factories to provide essential ingredients. Not only is it risky to rely on overseas suppliers, the failure of offshore producers to maintain safety and quality-control standards puts lives at risk.

The solution is to bring more manufacturing of life-saving products back to the U.S. For basic drugs, the real expense is in research and development, and the cost of production is usually low.

The latest research by San Francisco-based Prologis on COVID-19 and its implications for logistics. The report provides insights into the third phase of the global pandemic, defined as “the normal,” including quantifying the potential increase in long-term demand from higher inventory levels and accelerated e-commerce adoption.

The report’s authors say, “We expect that lessons learned from the pandemic will add demand tailwinds to logistics real estate in the “new normal.” Growth in direct-to-consumer delivery volumes and rapid replenishment needs should continue to emphasize the appeal of logistics real estate that is closer to end consumers.”

Among the findings are that accelerated e-commerce adoption and higher inventory levels have the potential to generate 400 million square feet or more of additional U.S. logistics real estate demand, or 150 to 200 million square feet per year for two to three years.

Re-tooling supply chains for increased e-fulfilment should create incremental net demand of 140 to 185 million square feet in total. Inventories could increase by 5% to 10% in a bid for resiliency, producing 285 to 570 million square feet of aggregate incremental demand.

Given the scope of the project, we believe it is appropriate to submit the project through the County’s Master Plan Development (MPD) Conditional Zoning process, the purpose of which is to:

... provide for unified large scale subdivisions, non-residential, and mixed use developments that promote economical and efficient land use, improved level of amenities, appropriate and harmonious variety, creative design, and a better environment through the approval of a general Master Plan.

In accordance with the provision of Section 2.9.2 of the Orange County Unified Development Ordinance (UDO), we are proud to submit this request to rezone a total of 161.21 acres of property, further defined in Section 1-2 of the document, to a MPD Conditional Zoning designation for development as the RTLP consistent with proposed development standards. This includes the rezoning of approximately 148.8 acres of property previously zoned MPD-CZ by the

County as part of the Settlers Point project. Approval of this request will, in effect, eliminate the County's previous action to approve the Settlers Point project in January of 2018.

This document contains the various standards and guidelines we propose be utilized by the County to evaluate various development projects submitted proposing the development of various land uses associated with the subject property. This includes listings of allowable land uses, land use intensity standards, open space requirements, signage regulations, and parking standards.

If approved, development within RTLP shall have to abide by the regulatory standards and limitations approved by the County elected officials.

We view this project, and this process, as the ultimate opportunity to work with the local officials to promote purposeful development designed to achieve the goals enumerated within the adopted Comprehensive Plan focusing on promoting the development of high intensity economic development land uses while at the same time protecting the integrity of the physical landscape.

SECTION 1-2 PROJECT SIZE AND LOCATION

The RTLP project is located within Orange County, North Carolina and is situated primarily on approximately one hundred sixty-one (161) acres of property to be developed within the designated Hillsborough Economic Development District, south of I-40 and west of Old NC 86, specifically:

1. A 88.56 acre tract of land - PIN# 9863718857
2. A 60.30 acre tract of land - PIN# 9863916573 (Applicant Note: Approximately 20 acres of the parcel, which is located north of Interstate 40, are not part of the application and will remain in the ownership of the current property owner and zoned EDH-2 consistent with current County regulations).
3. A 12.35 acre tract of land - PIN# 9862998894



SECTION 1-3 CURRENT LAND USES

As indicated above, RTLP will be located on multiple properties totaling 161 acres of land area.

A breakdown of existing land uses and zoning is as follows:

- PIN – 9863718857 Undeveloped MPD-CZ (formerly Settlers Point MPD-CZ)
- PIN – 9863916573 Undeveloped MPD-CZ (formerly Settlers Point MPD-CZ)
- PIN – 9862998894 Undeveloped R1

SECTION 1-4 ADJACENT PROPERTY INFORMATION

The properties surrounding RTLP are comprised of both lower density developed and large

undeveloped areas. The adjacent parcels to the North are opposite the right-of-way of Hwy 40 and are zoned EDH-2. The parcels to the South and West are largely residential and are zoned R1. The properties to the East are both R1 and EDH-5. Appendix A provides a listing of all property owners within 1,000 feet of the project as currently laid out.

As previously indicated, RTLP is designed to accommodate and protect adjacent properties and their current uses through the use of land use buffers and the protection of existing natural features. Please refer to SECTION V. OPEN SPACE for a detailed explanation of our proposed land use buffer program.

SECTION 1-5 CONSTRUCTION SCHEDULE

All public water and sewer lines shall be extended in accordance with the Town of Hillsborough utility policies.

Sanitary sewer will be extended to the property under Interstate 40 prior to or during the initial phases of construction. Depending on the construction sequencing of the building structures, the main will be extended to the appropriate building prior to that building's required Certificate of Occupancy.

A new water main will be extended along the Interstate 40 service road to serve the property. A looped water system will ultimately be provided with a connection back to the public system at a point on the Service Road or Old NC 86, as the case may be. So long as the flows and pressures are sufficient for the buildings and proposed uses, the loop will not be required for building certificates of occupancy.

Development shall utilize Service Road to obtain access to Old NC Highway 86. At the time development exceeds allowable traffic trips, as defined within the Master Traffic Impact Analysis (TIA), an alternative traffic improvement shall be required to serve the proposed development. This alternative shall be reviewed and approved by Orange County and the NC Department of Transportation and shall be installed in conjunction with the proposed development project generating the need for said alternative traffic improvement.

2. LAND USE PROGRAM

This request involves the rezoning of the aforementioned parcels to what the Applicant refers to as the Research Triangle Logistics Park Master Planned Conditional Zoning District. As we understand the process, if approved, the various parcels making up the project are going to have a zoning designation of MPD-CZ and will abide by the development standards adopted as part of the process. This new development is compatible with the purpose and intent of the Orange County Comprehensive Plan. Four development areas or pods (which are for illustrative purposes only and may differ in the final site plan) are identified on the master plan set along with illustrative depictions of buildings, loading and parking.

The following general development regulations are respectfully being proposed for the project:

SECTION 2-1 LAND USES

SECTION 2-1-1 PERMITTED LAND USES

Manufacturing, assembly, repair or servicing of industrial, business, or consumer machinery, equipment, products, or by-products mainly by providing centralized services for separate retail outlets. Contractors and building maintenance services and similar uses perform services off-site. Light industrial includes, by way of example and not limitation, the following uses:

1. Bottling.
2. Brewery, winery, distillery, cidery with tasting/sampling facilities and associated retail sales.
3. Bus or rail transit vehicle maintenance or storage facility.
4. Contractors storage including janitorial and building maintenance service, exterminator, or other maintenance yard or facility, building, heating, plumbing, landscaping or electrical contractor and others who perform services off-site, but store equipment and materials or perform fabrication or similar work on-site.
5. Food and beverage products
6. Lawn, tree or garden service.
7. Laundry, dry-cleaning, and carpet cleaning plants.
8. Leather and leather products except tanning.
9. Sheet metal, welding, machine, tool repair shop or studio.
10. Stone, clay, glass, and concrete products.
11. Woodworking, including cabinet makers and furniture manufacturing.
12. Fabricated metal products and machinery.
13. Industrial sign-making.
14. Leather and leather products includes tanning and finishing.
15. Manufactured or modular housing sales.
16. Primary metal manufacturing.

A facility conducting light manufacturing operations within a fully-enclosed building. Light manufacturing includes by way of example and not limitation, the following uses:

1. Clothing, textile apparel manufacturing.
2. Facilities engaged in the assembly, design, repair or testing of: analyzing or scientific measuring instruments; semiconductor and related solid state devices, including but not limited to clocks, integrated microcircuits; jewelry, medical, musical instruments, photographic or optical instruments; and timing instruments.
3. Office showroom/warehouse.
4. Printing, publishing, and lithography.
5. Production of artwork and toys, graphic design sign-making, movie production facility, photo-finishing laboratory.
6. Repair of scientific or professional instruments and electric motors

A facility focused primarily on the research and development of new products. Research and development includes by way of example and not limitation the following uses:

1. Laboratories, offices and other facilities used for research and development by or for any individual, organization or concern, whether public or private.

2. Prototype production facilities that manufacture a limited amount of a product in order to fully investigate the merits of such a product.
3. Pilot plants used to test manufacturing processes planned for use in production elsewhere

Facilities providing separate storage areas for personal or business use designed to allow private access by the tenant for storing or removing personal property. Self-service storage includes by way of example and not limitation the following uses:

1. Warehouse, self-service.
2. Fully enclosed indoor multi-story storage.
3. Mini-warehouse.

Facilities involved in the storage or movement of goods for themselves or other firms. Goods are generally delivered to other firms or the final consumer with little on-site sales activity to customers. Warehouse and distribution includes by way of example and not limitation the following uses:

1. Bulk storage, including nonflammable liquids, cold storage plants, including frozen food lockers, household moving and general freight storage, separate warehouse used by retail store such as furniture or appliance store.
2. Commercial packing for fruits and vegetables.
3. Distribution facility, central postal facility.
4. Freight, service facility.
5. Parcel services.
6. Transfer and storage business where there are no individual storage areas or where employees or automation are the primary movers of the goods to be stored or transferred.
7. Trailer storage, drop off lot.
8. Truck or motor freight terminal, cross-docking or service facility.
9. Trucking operation.
10. Warehouse.

Facilities involved in the sale, lease, or rent of products to industrial, institutional or commercial businesses. The use emphasizes on-site sales or order-taking and often includes display areas. Businesses may or may not be open to the general public. Products may be picked up on-site or delivered to the customer. Wholesale trade includes by way of example and not limitation the following uses:

1. Mail-order house.
2. Sale or rental of machinery, equipment, heavy equipment, building materials, special trade tools, welding supplies, machine parts, electrical supplies, plumbing supplies, janitorial supplies, restaurant equipment and store fixtures.
3. Wholesale sales of food, clothing, auto parts, building hardware and similar products.

Other Facilities, including by way of example and not limitation, the following uses:

1. Customary Accessory Uses to Principal land uses developed on-site

2. Government Facilities and Office Buildings
3. Government Protective Services
4. Bus Passenger Shelter,
5. Surface and structure parking as principal use
6. Mail kiosks for central mail pick-up,
7. Elevated Water Storage Tanks.
8. Public open space for use of on-site businesses, employees of same, and customers rather than the general public.
9. Natural and man-made pedestrian/bicycle paths

SECTION 2-1-2 EXCLUDED LAND USES

The Uses allowed in RTLP shall be broadly construed to allow for a wide range of uses and shall generally be allowed unless set forth on the following list of uses expressly prohibit:

1. Animal Slaughtering and Processing;
2. Vegetable Fats/Oil Manufacturing and Processing;
3. Concrete Batching Plant;
4. Leather and Hide Tanning;
5. Petroleum and Coal Processing, Preparation, and Distribution including Asphalt Plants;
6. Pulp, Paper, and Paperboard Mills;
7. Sawmills;
8. Uranium Mining;
9. Land Fills;
10. Body alteration (i.e. tattoo artist, body piercing, etc.);
11. Cemetery;
12. Crematoria;
13. Funeral Home;
14. Pawnshop/Payday Loan.
15. Junk/Salvage yard;
16. Massage Business;
17. Sexually Oriented Business;

SECTION 2-2 PERFORMANCE STANDARDS

SECTION 2-2-1 LAND USE INTENSITY

Land use intensity for the RTLP shall be regulated in accordance with the following:

1. The maximum floor area ratio shall be 0.65,
2. RTLP shall not be subject to any specific impervious area restrictions, except those necessary to meet or exceed the goals of the Falls Lake Watershed,
3. RTLP shall maintain a blended minimum percentage of open/landscaped space of twenty-five percent (25%) for the entire project. All areas restricted from development such as mapped 100-year flood plains, SCMs, wetlands, stream, stream

buffers and required Land Use Buffers shall count towards this requirement,

4. RTLP shall allow for a Maximum Building Height of 60 feet; however, accessory structures may exceed 60 feet.
5. All 100-year floodplains as regulated by FEMA and streams as regulated by the State within the Project shall be buffered and maintained in accordance with applicable County regulations as contained in Article 6.13 of the UDO,
6. A Letter of Map Revision has been submitted to FEMA to amend the 100-year flood elevation on the subject project. Development within this project shall comply with the effective flood map at the time of development.

SECTION 2-2-2 ENVIRONMENTAL FACTORS

Environmental factors for the RTLP shall be regulated in accordance with the following and are generally consistent with the Orange County enforced standards as detailed within Section(s) 6.4.2 through 6.4.7 of the UDO:

1. **NOISE:**
 - a. Noise generated by construction activities shall be regulated in accordance with generally accepted construction standards for a development of similar size and scope.
 - b. Land uses within the project shall comply with the County's noise ordinance and Section 6.4.3 of the UDO.
2. **VIBRATION.**

RTLP shall comply with any and all applicable Orange County vibration ordinance and requirements.
3. **AIR POLLUTION.** RTLP shall comply with any and all applicable air quality standards established by the State Environmental Management Commission and with any and all Air Quality permits issued for the project.
4. **ELECTROMAGNETIC INTERFERENCE.** RTLP shall comply with any and all applicable standards established by the State as well as the Federal Communications Commission (FCC) concerning electromagnetic interference,
5. **HAZARDOUS MATERIALS.** Individual tenants shall be required to demonstrate compliance with any and all applicable Federal, State, and local regulations governing the storage, use, and disposal of hazardous materials,
6. **SOLID WASTE.** The following standards shall be observed with respect to the management of solid waste:

- a. The developer shall adhere to the proper disposal methodology for solid waste management.
 - b. The applicant shall provide external space for collection of solid waste and recyclable materials. Materials collected shall be at least equivalent to the services provided by Orange County Solid Waste.
 - c. Waste collection areas shall be located in such a manner as to provide convenient access for users of the facility and safe passage for service vehicles.
 - d. The developer shall be required to place the following additional notes on any approved site plan:
 - i. Any gate design will include gate retainers.
 - ii. If any vehicles are parked in the refuse or recyclables collection vehicle access area, the containers will not receive service until the next scheduled collection day.
 - iii. Orange County will not be responsible for any pavement damage that may result from service vehicles.
 - iv. By Orange County Ordinance, clean wood waste, scrap metal and corrugated cardboard, all present in construction waste, must be recycled.
 - v. By Orange County Ordinance, all haulers of construction waste must be properly licensed.
 - e. In cases where waste collection areas are located across property lines or district lines for shared areas, the developer shall prepare and record a joint access agreement (and a shared dumpster agreement) to assure that (both parties may use) the proposed trash/recycling area and that it can be serviced across property lines.
 - f. The developer shall reserve space within all solid waste collection areas for segregated grease rendering/recycling collection facilities and shall provide space for segregated food waste collection near the delivery entrance for any building that houses, proposes to include, or may at some future date incorporate a restaurant, cafeteria, bar, or other food service facility at any time.
 - g. All solid waste containers, dumpsters, recycling bins, etc. shall be located within an enclosure, buffered in accordance with the standards contained herein, and meeting the following criteria:
 - i. Loading areas shall be designed and situated not to negatively affect adjacent properties.
 - ii. Solid waste enclosures shall be so located as to not impact internal traffic flow,
 - iii. Loading zones shall not be located within areas designated as housing for solid waste facilities.
7. **EROSION CONTROL.** The development will comply with the NC Sedimentation and Pollution Control Act of 1973 and the North Carolina Administrative Code Title 15A Chapter 4.
8. **STORMWATER MANAGEMENT.** The following standards shall be observed with respect to

stormwater management activities for the project:

- a. Riparian areas (stream buffers) shall be maintained consistent with the provision(s) of Section 6.13 of the UDO.
 - b. Impacts to the Neuse stream buffers on site shall comply with the uses listed in the Neuse Rules and the Orange County Unified Development Ordinance. Examples of listed uses include utilities, roadways, etc.
 - c. The project shall comply with the stormwater requirements listed in the Falls Lake Rules. This includes:
 - i. No net increase in peak flow leaving the site from the predevelopment conditions for the 1-year, 24-hour storm;
 - ii. Nitrogen and Phosphorus load contributions leaving the site must be held to 2.2 lbs per acre per year and .33 lbs per acre per year respectively. These standards can be met via offset payments and/or SCMs.
 - d. A Master Stormwater Management Plan (SMP) shall be developed to address stormwater runoff for the entire development even though individual parcels may be responsible for installing stormwater control measures (SCMs).
 - e. Innovative stormwater SCMs and practices may be utilized that meet or exceed the requirements of the current version of the North Carolina Division of Water Quality *Stormwater Best Management Practices Manual* (Latest Edition).
 - f. The developer shall collaborate with County staff during the SMP design process.
9. **WATER SUPPLY AND SEWAGE DISPOSAL.** Please refer to Section Four (4) Utilities and Other Public Services.

SECTION 2-2-3 GENERAL PERFORMANCE STANDARDS

1. ENVIRONMENTAL:

The improvements common to the development of each building pod result in a relatively limited overall land disturbance as compared to the developed area. Further, with the exception of a single road crossing, there are no impacts to the 100-year floodplain or Neuse River buffers and substantial open space is preserved and maintained. The development also utilizes an existing stream crossing on the I-40 service road for access. Minor impacts will result from the new internal road crossing necessary to provide connectivity between the four proposed development areas/pods. The crossing has been designed as a perpendicular crossing to minimize impacts and is located higher in the watershed where the stream is smaller to further reduce impact. Additionally, onsite stormwater runoff generated by the development of the site is being attenuated and treated via SCMs to minimize downstream impacts.

The following additional performance standards shall be adhered to in addressing the environmental impact of the RTLTP project:

- a. RTLP shall adhere to required buffers as detailed within Section 6.13 Stream Buffers of the UDO.

2. INDOOR ENVIRONMENTAL QUALITY:

- a. Through lease agreements, covenants, and other similar deed restrictions the developer shall require that:
 - i. Smoking be prohibited within a building or that there be designated smoking areas within a structure. If smoking areas are designated within a building, they shall be so located to effectively contain, capture, and remove ETS from the building,
 - ii. That external smoking areas shall be a minimum of fifty (50) feet away from entries, outdoor air intakes and operable windows.

SECTION 2-3 DESIGN CRITERIA

SECTION 2-3-1 ARCHITECTURAL DESIGN (NOTE THAT DEPICTIONS BELOW ARE FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REPRESENT ACTUAL TENANTS).

Exterior Building Materials

- Finished building materials shall be applied to all sides of a building.
- Exterior wall materials shall include, but not be limited to: stucco, concrete, textured concrete, wood, glass, steel, brick, stone, and masonry.
- Building colors shall strive to be harmonious and compatible with the natural surroundings and the general overall palette shall be earth tones; provided however, it is recognized that buildings often integrate corporate identity and nothing herein shall prevent the ability to utilize corporate identity colors.

Ex. Corporate Identity



Architecture

The architectural design of an industrial structure must consider many variables, from the functional use of the building, to its aesthetic design, to its “fit” within the context of the project site.

The following guidelines help buildings achieve the appropriate level of design detail on all facades facing public roadways to avoid blank/uninteresting facades.

1. A single, dominant, monolithic building mass is not acceptable, especially for larger buildings, however, many techniques shall be allowed to provide “visual breaks”.

Breaks in building mass should be used to provide visual relief for long building facades and techniques to allow visual breaks shall be flexible and include, by way of example and not limitation:

- a. Changes in height and the horizontal plane;



- b. Changes in Materials



c. Changes in Textures



d. Changes in Color



e. Reveals and/or Jogs



f. Utilization of other architectural enhancements



2. Primary building entries should be readily identifiable and well defined through the use of projections, recesses, columns, roof structures, or other design elements.
3. Expansions to existing buildings should provide for continuity between the old building and the new addition. The addition need not strictly match the existing building, but should include prominent design elements of the old building to provide architectural compatibility between old and new.
4. Windows and doors are key elements of any structure's form and should relate to the scale of the elevation on which they appear. Windows and doors can establish character by their rhythm and variety. Recessed window and door openings are encouraged, but not required.
5. Design elements which are undesirable and should try to be avoided include:
 - a. Highly reflective surfaces;
 - b. Exposed, untreated precision block walls;
 - c. Barbed wire;
 - d. "Stuck on" mansard roofs;
 - e. Materials with high maintenance such as stained wood shingles

SECTION 2-3-2 LANDSCAPING AND PRESERVATION DESIGN

1. All required internal landscaping shall be installed and maintained by the developer or their successor in perpetuity,
2. Perimeter landscape buffers shall utilize existing vegetation or the portion of the buffer that is disturbed shall be planted in conformance with the buffer section depicted on the master plans.
3. A comprehensive landscaping plan shall be submitted to the Orange County Planning Department for review and approval by members of the staff consistent with the approved standards for this project.
4. Required buffers shall be consistent with the provisions of the MPD-CZD.
5. Limits of disturbance shall be in accordance with the approved Master Erosion Control and

Grading Plan approved by the County prior to any earth disturbing activity.

6. The required landscaping within parking areas shall be in accordance with the following:
 - a. Parking lot shade trees shall be provided at a ratio of one (1), one and one half-inch (1.5") minimum caliper tree for every ten (10) car parking spaces; Caliper size is measured at the time of planting;
 - b. The applicant/developer is required to demonstrate that sixty percent (60%) of the car parking spaces are within seventy-five (75) feet of the center of a shade tree. If not, additional landscaping shall be required.
 - c. The minimum tree planting area shall be 200 square feet except where tree grates are provided,
 - d. Where trees are planted within tree grates, and surface paving encroaches into the planting area, then the minimum planting area shall be sixteen (16) square feet in area by two (2) feet in depth,
 - e. A ten-foot vegetated buffer shall be provided between vehicular use areas and internal access roads.
7. Screening of parking areas along the perimeter boundary of the project shall maintain a minimum tree spacing of sixty (60) feet.

Landscaping along a building's perimeter shall be in accordance with the following standards:

- a. Twenty percent (20%) of a building's perimeter shall be landscaped while maintaining the necessary sidewalk area,
 - b. These areas may consist of lawn, planters, or shrub areas so long as the shrub areas, that have to be twenty-four inches (24") minimum in width, comprise a minimum of twenty percent (20%) of the total linear dimension along the building's perimeter.
8. With respect to internal street landscaping, there shall be one (1) tree at a one-inch (1") caliper provided every one hundred (100) feet,
9. All ground level HVAC, mechanical equipment cabinets, etc. shall be screened from view through the use of landscaping, walls, and or fencing,
10. All solid waste containers, dumpsters, recycling bins, etc. shall be enclosed within a screened area. In cases where the enclosure is connected to a building, the dumpster shall still be required to be enclosed.

SECTION 2-3-3 SIGNS AND LIGHTING

Reference Exhibit F of the Exhibits section for Master Sign plans.

Lighting of Buildings, Parking Lots and Walkways

(NOTE THAT DEPICTIONS BELOW ARE FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REPRESENT ACTUAL TENANTS).

Generally: Lighting fixtures shall be selected, located, aimed, and shielded so that direct illumination is focused exclusively on the building façade, plantings, and away from adjoining properties, public or private rights-of-way, and the night sky

- A) All lighting shall be full cut-off fixtures and have a maximum height of forty-five (45) feet.
- B) All lighting shall comply with maximum footcandle limits at property lines as noted in Section 6.11.6.A of the UDO.
- C) All lighting must be shielded to confine light spread within the site boundaries and provide uniform illumination in compliance with the following minimum levels:

TABLE 6.11.8: ECONOMIC DEVELOPMENT DISTRICT MINIMUM OUTDOOR LIGHTING STANDARDS	
LOCATION	MINIMUM FOOTCANDLES
Building Entrances	4.00
Sidewalks	1.00-3.00
Pedestrian Paths	1.00
Parking Lots	0.50

It is the intent of this section to require minimum light levels during established business hours or in those instances where members of the general public will be on-site to ensure public safety.

- D) Pedestrian walkways, if provided, shall be lighted for security and to create an inviting pedestrian environment;
- E) Accent lighting must also be provided to illuminate such key locations as building and driveway entries, and activity areas;



F) Lighting for the purpose of illuminating landmarks and unique features of the site is also encouraged, but not required.

G) Security lighting fixtures or floodlights must not project over the fascia or roof line of the building(s);



H) Parking area and driveway fixtures should be mounted at or below a maximum height of ___ feet above the surface of the parking area or driveway;





- I) The design of light fixtures and structural supports must be compatible with the architecture of the principal building(s) and identification signs;



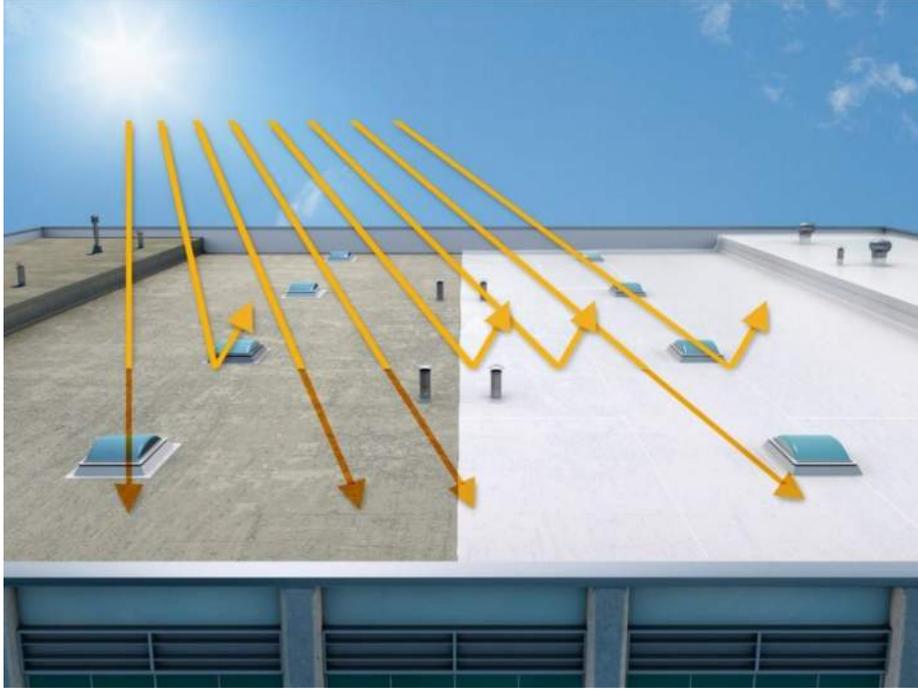
- J) Ground-mounted lighting fixtures must be weather-proof.

SECTION 2-3-4 SUSTAINABLE DESIGN INITIATIVES

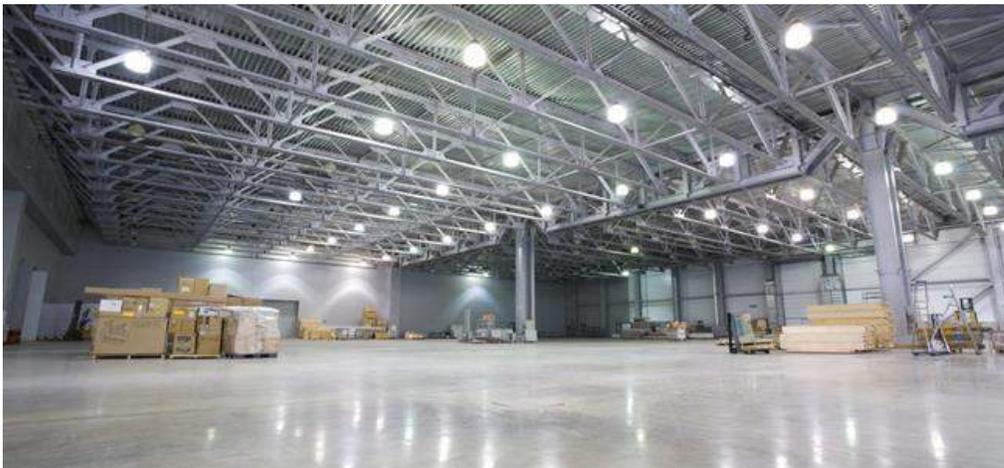
(NOTE THAT DEPICTIONS BELOW ARE FOR ILLUSTRATIVE PURPOSES ONLY AND DO NOT REPRESENT ACTUAL DESIGN REQUIREMENTS).

Research Triangle Logistics Park real estate facilities will strive to integrate geographically-relevant sustainable design features, including:

Cool Roofs - Reduce energy demand and the urban heat island effect



Energy-efficient lighting - Reduce energy consumption



Hybrid and carpool parking - Promotes low-carbon transportation solutions



Skylights and clerestory windows - Maximize use of natural sunlight



Water conservation - Reduces natural resource usage



Solar and other renewables - Generate sustainable energy



3. TRANSPORTATION

SECTION 3-1 INTERNAL TRAFFIC CIRCULATION AND PARKING

The parking standards to be used are as follows: Minimum Vehicular Parking Requirements: 1 space per 750s.f. of office space + 1 space per 3,000s.f. of additional indoor area.

Thoroughfare improvements shall be completed in accordance with the following:

1. External roadway improvements will be constructed to NC DOT public road standards and shall be constructed in accordance with a phased construction/development plan in accordance with NC DOT requirements and guidelines, the approved Traffic Impact Analysis (TIA), the approved Master Plan, and the standards outlined herein,
2. The developer shall provide a Traffic Impact Statement stating that the proposed development is in accordance with the Master Plan TIA report that identified anticipated impacts of this development at the intersection of OLD US 86 and Interstate 40. The developer shall be responsible for constructing any and all improvements at those intersections that are recommended to mitigate direct impacts resulting from this development unless required by current existing conditions.
3. Any required roadway improvements shall try to be accommodated within existing road rights-of-way.
4. All street signals shall be erected on metal poles.
5. The County, and NC DOT shall approve all metal utility poles allowing for the erection of street signals, both internal and external, prior to installation,
6. The developer shall identify and develop entrances and exits for pedestrian and construction vehicular traffic during the development of the project to avoid conflict.
7. All traffic directional signage shall include, but not limited to:
 - a. Stop signs,
 - b. Yield signs,
 - c. Bus parking and unloading informational signs, if any,
 - d. Lane ends, Merge signs,
 - e. Caution Pedestrian Traffic – Yield Signs,
 - f. Traffic safety signs designed to direct construction traffic throughout the site,
 - g. Traffic warning signs indicating the location of private driveways and forbidding public access to the various properties,
 - h. Through traffic signs,
 - i. Any and all signs required by NC DOT for the project

SECTION 3-2 TIA IMPROVEMENT SUMMARY

See Exhibit H Traffic Impact Analysis

4. UTILITIES AND OTHER PUBLIC SERVICES

SECTION 4-1 INTERNAL UTILITY DESIGN

A written, signed agreement between the applicant and the Orange County and/or the Town of Hillsborough shall be executed, which describes the timing, phasing, design, and financing of public water distribution and public sanitary sewer collection mains for the project.

Sanitary sewer will be extended to the property under Interstate 40 prior to or during the initial phases of construction. Depending on the construction sequencing of the building structures, the main will be extended to the appropriate building prior to that building's required Certificate of Occupancy.

A new water main will be extended along the Interstate 40 service road to serve the property. A looped water system will ultimately be provided with a connection back to the public system. So long as the flows and pressures are sufficient for the buildings and proposed uses, the loop will not be required for building certificates of occupancy.

5. OPEN SPACE

SECTION 5-1 VEGETATED BUFFERS

The Open Space management plan differs from the Landscape Design standards outlined within PART THREE of this document in the following manner:

The RTLP project shall adhere to the following Open Space requirements:

1. There shall be a one hundred (100) foot Perimeter Structure Buffer on the Western property line where no construction of any four sided walled and roofed building is allowed that is built or constructed principally above ground and intended to be continuously occupied, including but not limited to load bearing walls, columns, beams or girders. For purposes of clarification, the following, by way of example and not limitation, shall not be defined as a structure for the 100' Perimeter Structure Buffer: recreational picnic or gazebo, retention or detention areas, retaining walls, landscaping, bridges, roads, parking lots, etc.
2. There shall be a fifty (50) foot Perimeter Building Buffer on the Western property line where no construction of any of the following is allowed: four sided walled and roofed building that is built or constructed principally above ground and intended to be continuously occupied, including but not limited to load bearing walls, columns, beams or girders, or parking lots.
3. There shall be a twenty-five (25) foot Land Use Buffer to be installed along the Service Road and a thirty (30) foot Land Use Buffer along the north side of Davis Road.
4. All 100-year floodplains as regulated by FEMA and streams as regulated by the State within the Project shall be buffered and maintained in accordance with applicable County

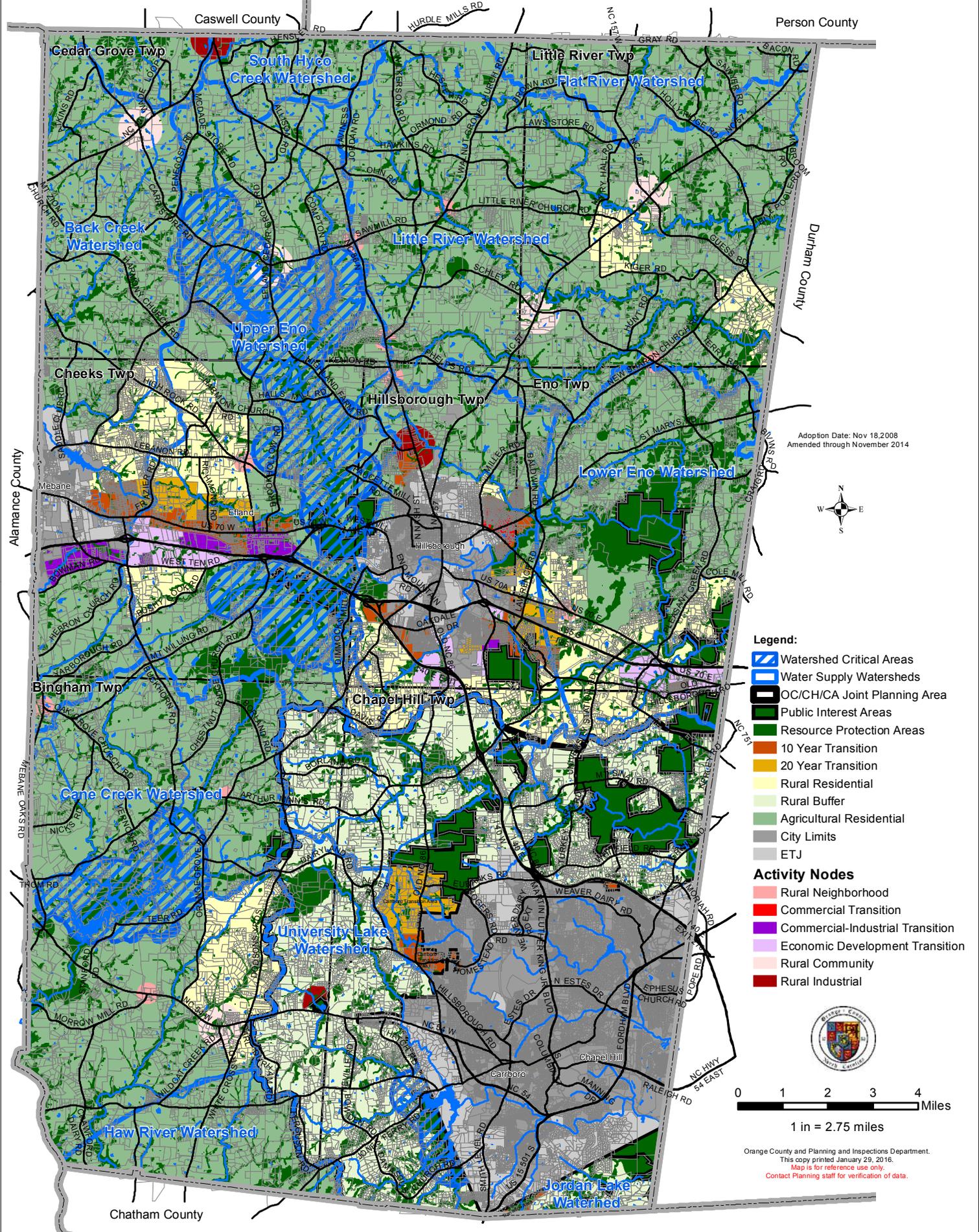
regulations as contained in Article 6.13 of the UDO,

EXHIBIT A

PIN	OWNER1_FIRST	OWNER1_LAST	OWNER2_FIRST	OWNER2_LAST	ADDRESS1	ADDRESS2	CITY	STATE	ZIPCODE
9862690948	ROBBIE D	WRIGHT	DAVID FRANKLIN	WRIGHT	3914 ODE TURNER RD		HILLSBOROUGH	NC	27278
9862698851	IRWIN O	ROJAS	SILVIA E	MORENO	111 LINNET RD		Hillsborough	NC	27278
9862796751	THOMAS ALLEN	DAVIS	RHONDA PAGE	DAVIS	501 DAVIS RD		HILLSBOROUGH	NC	27278
9862896927	DIANNE H	DAVIS			319 DAVIS RD		HILLSBOROUGH	NC	27278
9862899868	MYRA E	GWIN SUMMERS	RICHARD W	SUMMERS	103 GRAPEVINE LN		Hillsborough	NC	27278
9862991849	SUMMERS MYRA E	GWIN	RICHARD W	SUMMERS (H)	103 GRAPEVINE LN		HILLSBOROUGH	NC	27278
9862992837	DAVID M	BARLOW	RHONDA M	BARLOW	223 DAVIS RD		HILLSBOROUGH	NC	27278
9862998894		FACILITY CARE SERVICES INC			19 HARRIER CIRCLE		ROCHESTER	NY	14623
9863503862	KAREN FAITH TURNER	HALL			1101 SAM TUCKER LANE		HILLSBOROUGH	NC	27278
9863526072	JAMES	GARLAND			2711 ODE TURNER RD		HILLSBOROUGH	NC	27278
9863539059	FRANKLIN E	GARLAND			3020 ODE TURNER RD		HILLSBOROUGH	NC	27278
9863604417	JOEL K	GILLIS	ANGEL S	GILLIS	124 LINNET DR		HILLSBOROUGH	NC	27278
9863607374	FREDERICK L	TAPP	LINDA Y	TAPP	119 LINNET DR		HILLSBOROUGH	NC	27278
9863615525	JAMES	GARLAND			2711 ODE TURNER RD		HILLSBOROUGH	NC	27278
9863632994	VERONICA	DUCLAY	THIERRY	DUCLAY	32 GREENHILLS RD		HUNTINGTON STATION	NY	11746
9863700110	DIANE H	DAVIS			319 DAVIS RD		HILLSBOROUGH	NC	27278
9863704359	JOHN	DAVIS	SCOTT	DAVIS	503 GABLEFIELD LN		APEX	NC	27502
9863709304	MIGUEL G	MUNOZ	DAWN C	MUNOZ	425 DAVIS RD		HILLSBOROUGH	NC	27278
9863718857	SUZANNE H	MCGRADY			11508 BRIDGETENDER DR		RICHMOND	VA	23233
9863802371	ANGELA DENISE DAVIS	BARNETT			549 DIXON RD		WILLOW SPRING	NC	27592
9863805324	DIANNE H	DAVIS			319 DAVIS RD		HILLSBOROUGH	NC	27278
9863809523	STEPHEN DUSTIN	WILLIAMS	JOSHUA TRAVIS	HAM	1243 GLENWATER DR		CARY	NC	27519
9863827960	W ALLEN	ADDISON	SALLY A	ADDISON	PO BOX 727		HILLSBOROUGH	NC	27278
9863900565	SUMMERS MYRA E	GWIN	RICHARD W	SUMMERS (H)	103 GRAPEVINE LN		HILLSBOROUGH	NC	27278
9863916573	CHRISTY D ETAL	BAILEY	JOHN O	CLAYTON	7510 COUNTRY LANE		ROUEMONT	NC	27572
9863936843	SALLY A	ADDISON	W ALLEN	ADDISON	PO BOX 727		HILLSBOROUGH	NC	27278
9862889603	BLAINE	KESSINGER	MARCIA	KESSINGER	200 OAK RIDGE RD		Hillsborough	NC	27278
9862891480	JAMES G JR	BUCHANAN	RONDA F	BUCHANAN	313 OAK RIDGE DR		HILLSBOROUGH	NC	27278
9862893196	CHALRES M TRUSTEE	MAYER	ELLEN C TRUSTEE	MAYER	7029 WOODMORE TERRACE		LAKEWOOD RANCH	FL	34202
9862894553	BERNARD	HINSON	MELISSA	HINSON	3606 JEDI WAY		HILLSBOROUGH	NC	27278
9862894739	PAUL A	DICKEY	ELIZABETH J	PUCKETT	108 GENTLE WAY		HURDLE MILLS	NC	27541
9862896092	JAMES W	BARRICK			211 OAKRIDGE DR		HILLSBOROUGH	NC	27278
9862896438	MATTHEW D	MITCHELL	KAILA D	MITCHELL	320 DAVIS RD		HILLSBOROUGH	NC	27278
9862898435	JUSTIN H	MITCHELL			2008 DAVIS RD		HILLSBOROUGH	NC	27278
9862980913	JAMES W	BARRICK			211 OAK RIDGE DR		HILLSBOROUGH	NC	27278
9862983600	CHRISTOPHER B	NIEVES			104 OAK RIDGE DR		HILLSBOROUGH	NC	27278
9862984823	MATTHEW ETAL	CLARK			4503 BUMPHUS RD		CHAPEL HILL	NC	27514
9862990443	ROY VERNON	SCOTT	MARY G	SCOTT	302 DAVIS RD		HILLSBOROUGH	NC	27278
9862997320	CHRIST	HILLSBOROUGH UNITED CHURCH OF			200 DAVIS RD		HILLSBOROUGH	NC	27278
9862999596	MATTHEW ETAL	CLARK			4503 BUMPHUS RD		CHAPEL HILL	NC	27514
9872080892	CYNTHIA L	PETERSON	JEAN FRANCOIS	PROVOST	2425 ARBOR LN		HILLSBOROUGH	NC	27278
9872087570	CHARLENE W	HAMLETT			3333 CHAPEL HILL BLVD	STE C	DURHAM	NC	27707
9872095945	LARRY B	LEE			3503 OLD NC 86		HILLSBOROUGH	NC	27278
9872098324	THEODORE L	BRYANT	BEVERLY N	BRYANT	2000 WOODVIEW DR		DURHAM	NC	27704
9872187626	THEODORE L	BRYANT	BEVERLY N	BRYANT	9016 ALBATROSS CT		RALEIGH	NC	27613
9872191961	MICHAEL	CHILDRESS	KARLA	CHILDRESS	101 GLADYS LN		HILLSBOROUGH	NC	27278
9872193459	THEODORE L	BRYANT	BEVERLY N	BRYANT	9016 ALBATROSS CT		RALEIGH	NC	27613
9872196844	MICHAEL WILLIAM	SUDYK			418 DARBY CREEK LANE		MORRISVILLE	NC	27560
9873006678	VIVIAN	BEST			4018 WRENN RD		DURHAM	NC	27705
9873007189	JOHN JR	BOXTER	SHANNON	MARTIN	3423 OLD NC 86		HILLSBOROUGH	NC	27278
9873008345	JOSEPH S	SHORE	SARAH C	SHORE	3501 OLD NC 86		HILLSBOROUGH	NC	27278
9873009867	SUSAN D TRUSTEE	BAREFOOT	CYNTHIA D TRUSTEE	WAGONER	3319 OLD NC HWY 86		Hillsborough	NC	27278
9873014031	RANT B JR	BARLOW			3315 OLD NC 86		HILLSBOROUGH	NC	27278
9873019000	RANT B JR	BARLOW			3315 OLD NC 86		HILLSBOROUGH	NC	27278
9873100408	ROWDY B	WALKER			1877 FLYING W TRL		Hillsborough	NC	27278
9873100657	DAN E	WAY			3401 OLD NC 86		HILLSBOROUGH	NC	27278
9873104230	MICHAEL W	SUDYK	GEORGE W	SUDYK	3412 COUNTRY CLUB DR		GASTONIA	NC	28056
9873104310	BEATRICE S	BROOKS			3410 OLD NC 86		HILLSBOROUGH	NC	27278
9873202388	ROBERT J ETAL	AYERS	LUCILLE	AYERS	1031 JONES FERRY RD		PITTSBORO	NC	27312
9873115415	MICHAEL J	DODSON			P O BOX 1081		HILLSBOROUGH	NC	27278
9873114636	MICHAEL J	DODSON			P O BOX 1081		HILLSBOROUGH	NC	27278
9873018382	AMANDA B	SHAKHLOUL	TAMER G	SHAKHLOUL	3303 OLD NC 86 S		HILLSBOROUGH	NC	27278
9873017657	TODD L	HORTON			225 JOHN HORTON RD		APEX	NC	27523
9873017820	LOUISE J	SCARLETTE			3209 OLD CH HILLSBOROUGH		HILLSBOROUGH	NC	27278
9873110686	TODD L	HORTON			225 JOHN HORTON RD		APEX	NC	27523
9873110739	TODD L	HORTON			225 JOHN HORTON RD		APEX	NC	27523
9873111777	TODD L	HORTON			225 JOHN HORTON RD		APEX	NC	27523
9862893609	DIANNE H	DAVIS			319 DAVIS RD		HILLSBOROUGH	NC	27278

EXHIBIT B

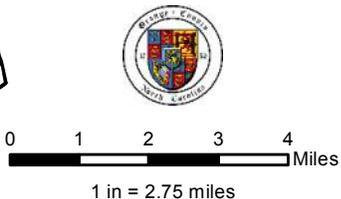
Future Land Use Map of the Orange County Comprehensive Plan



Adoption Date: Nov 18, 2008
Amended through November 2014



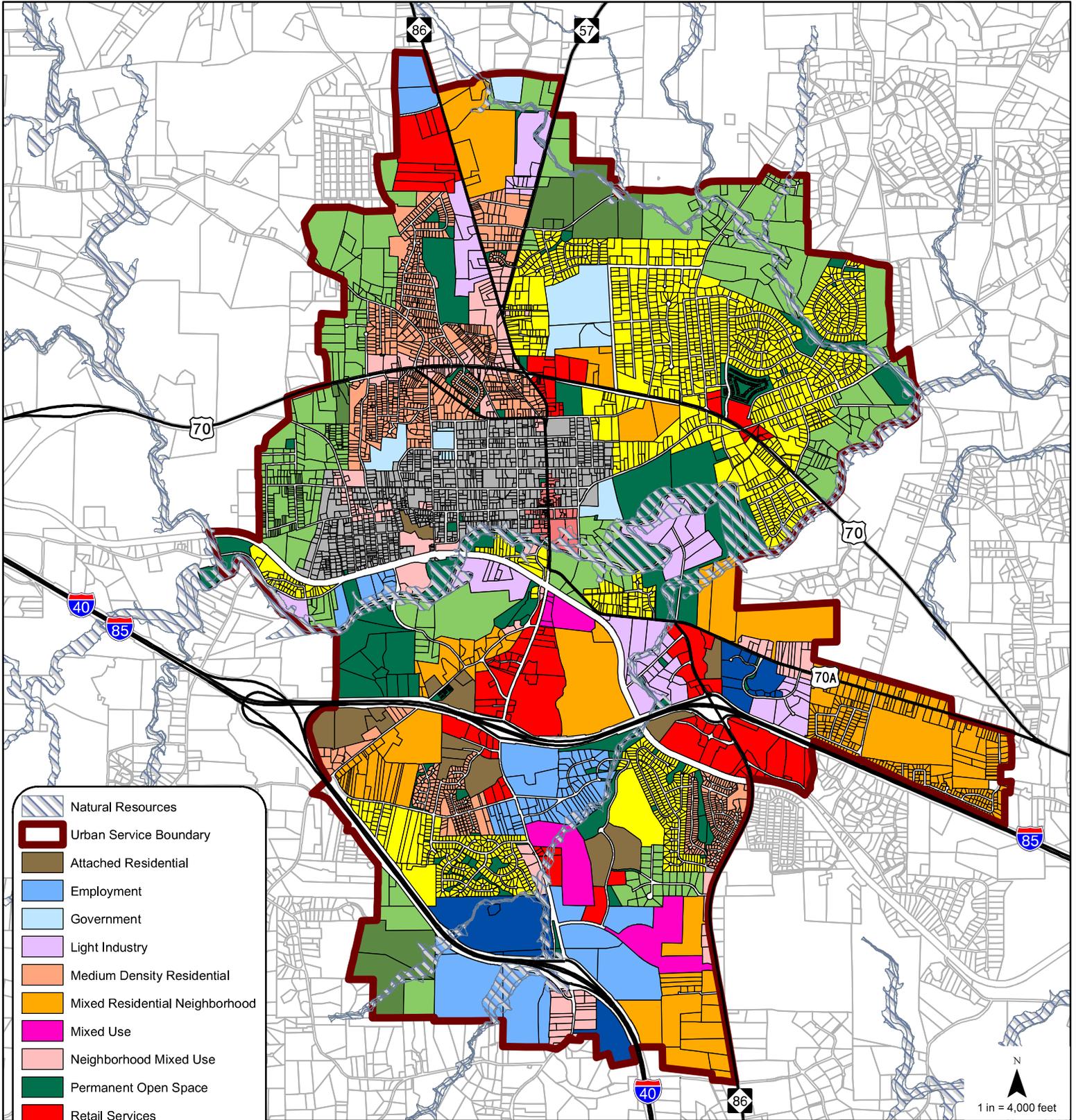
- Legend:**
- Watershed Critical Areas
 - Water Supply Watersheds
 - OC/CH/CA Joint Planning Area
 - Public Interest Areas
 - Resource Protection Areas
 - 10 Year Transition
 - 20 Year Transition
 - Rural Residential
 - Rural Buffer
 - Agricultural Residential
 - City Limits
 - ETJ
- Activity Nodes**
- Rural Neighborhood
 - Commercial Transition
 - Commercial-Industrial Transition
 - Economic Development Transition
 - Rural Community
 - Rural Industrial



Orange County and Planning and Inspections Department.
This copy printed January 29, 2016.
Map is for reference use only.
Contact Planning staff for verification of data.

EXHIBIT C

Town of Hillsborough/Orange County Central Orange Coordinated Area Land use Plan Areas Within the Town's Urban Service Boundary



-  Natural Resources
-  Urban Service Boundary
-  Attached Residential
-  Employment
-  Government
-  Light Industry
-  Medium Density Residential
-  Mixed Residential Neighborhood
-  Mixed Use
-  Neighborhood Mixed Use
-  Permanent Open Space
-  Retail Services
-  Rural Living
-  Small Lot Residential
-  Suburban Office
-  Town Center
-  Urban Neighborhood
-  Working Farm
-  Parcels

The **Urban Service Boundary** indicates the limits of Hillsborough water and sewer service consistent with an Inter-local Agreement with Orange County, OWASA, Chapel Hill, Carrboro, and Hillsborough. Future Land Uses would be used by Hillsborough and Orange County as the basis for approving zoning designations on colored parcels and those within the boundary, consistent with the Inter-local Agreement between Orange County and Hillsborough.

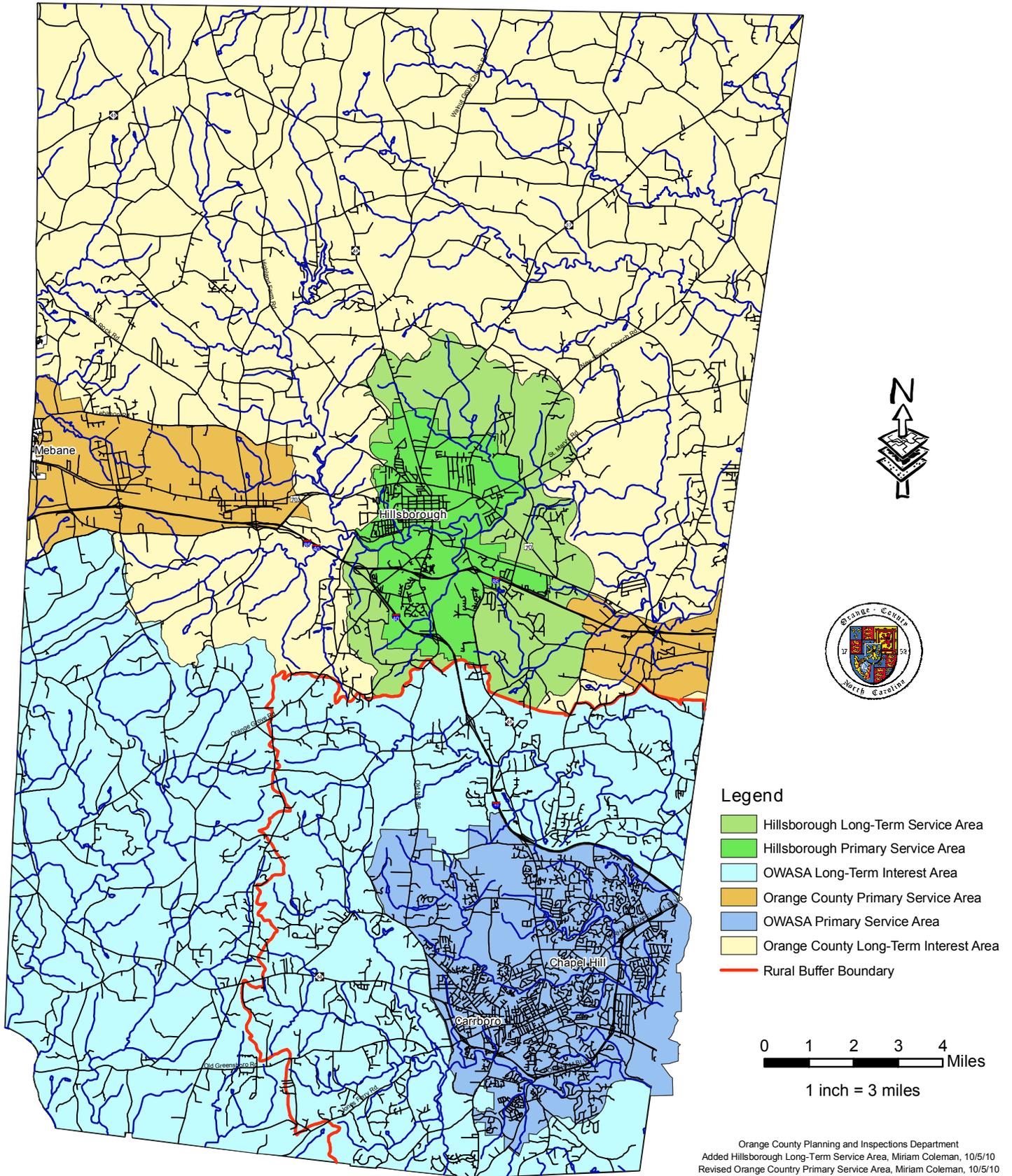
Areas **outside** the Urban Services Boundary **with** a Future Land Use designation are due to the boundary crossing a parcel. Areas **outside** the Urban Services Boundary with current utility service from the Town of Hillsborough **will retain service**.

Approved by Hillsborough 3-11-13
 Approved by the BOCC 11-5-13
 Amended by the BOCC and Hillsborough 9-12-16

EXHIBIT D

Appendix A

Water and Sewer Management Planning and Boundary Agreement



Legend

- Hillsborough Long-Term Service Area
- Hillsborough Primary Service Area
- OWASA Long-Term Interest Area
- Orange County Primary Service Area
- OWASA Primary Service Area
- Orange County Long-Term Interest Area
- Rural Buffer Boundary

0 1 2 3 4 Miles

1 inch = 3 miles

Orange County Planning and Inspections Department
 Added Hillsborough Long-Term Service Area, Miriam Coleman, 10/5/10
 Revised Orange County Primary Service Area, Miriam Coleman, 10/5/10
 Updated Hillsborough Primary Service Area, Miriam Coleman, 10/22/08
 Updated Streets, Miriam Coleman, 2002
 Revised Map to show retracted Chapel Hill Urban Service Boundary, Carrie Whitehill, 11/14/01
 Original Map Prepared by Beth McFarland, 04/17/97

EXHIBIT E

(LAND USE, REZONING AND ENTITLEMENTS)

THIS OWNER AUTHORIZATION AND CONSENT ("Authorization") is made and entered into as of the date set forth below, by WILLIAM PATRICK CLAYTON, JUDITH HEWITT CLAYTON, JOHN OLIVER CLAYTON, SHIRLEY MILLER CLAYTON, OLIVIA ANN RIDGE, DAVID EUGENE RIDGE, KATHY ELIZABETH CORN, CHRISTY DEANNA BAILEY AND BRYANT LEE BAILEY (hereinafter jointly referred to as "Owner"), for the benefit of TERRA EQUITY, INC., a Texas corporation and/or its successors and assigns ("Buyer"), and ORANGE COUNTY, NORTH CAROLINA (the "County");

RECITALS

A. Owner is the owner of that certain real property located in Orange County, North Carolina, bearing PIN Number 9863916573 and more particularly described on Exhibit A attached hereto (the "Property").

B. Buyer is under contract to purchase the Property and in connection therewith has made and/or intends to make certain applications to the County for land use amendments, map amendments, rezoning, zoning amendments, site plan approval, permits, and other approvals and entitlements necessary or desired in connection with the proposed purchase and/or development of the Property (the "Entitlement Requests").

C. Owner has agreed to provide this Authorization to authorize and consent to the Entitlement Requests.

AUTHORIZATION AND CONSENT

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Owner hereby authorizes Buyer to make the Entitlement Requests and hereby consents to the Entitlement Requests. Buyer and the County shall be authorized to rely on this Authorization as to any and all Entitlement Requests made by Buyer.

IN WITNESS WHEREOF, Owner has caused this Authorization to be executed as of the date set forth in the notary acknowledgment below.

OWNER:


WILLIAM PATRICK CLAYTON

10/1/11

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Brenda Markle TI

August

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Judith Hewitt Caffon

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August 3, 2

John Peter Clay
JOH

Nov

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Jimmy W. Jimmy

May TERE
2/23/20

Shirley Miller Clayton
M.

* North Carolina

OKA

Mary
Mary Jerry
M W Terry

Planaria Kidge

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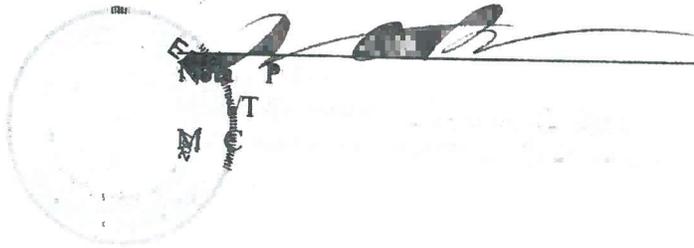
O Reg



and Eugene Ritz
U IGE

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s Daw dge f s

A circular stamp containing the letters 'MCT' is partially obscured by a signature and a horizontal line. The signature is written in a cursive style and overlaps the right side of the stamp.

Kathy, Elizabeth Corn
KATHY L IZAB CORN

North Carolina

*

ARY EMR
2/23/20

Christy Beanna Baird

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Thence, N 89° 26' 09" W for a distance of 156.24 feet to a point; Thence, N 00° 10' 25" E for a distance of 129.93 feet to a point; Thence, N 00° 10' 08" E for a distance of 668.05 feet to a point; Thence, N 00° 16' 54" E for a distance of 1598.61 feet to the point of beginning, containing 2,550,802 square feet OR 58.558 acres, more or less.

Notwithstanding anything herein to the contrary, **LESS AND EXCEPTING HEREFROM** all property located on the north side of Interstate 40.

**OWNER AUTHORIZATION AND CONSENT
(LAND USE, REZONING AND ENTITLEMENTS)**

THIS OWNER AUTHORIZATION AND CONSENT ("**Authorization**") is made and entered into as of the date set forth below, by LANDMARK MANAGEMENT PARTNERS, LLC AND FACILITY CARE SERVICES, INC. (hereinafter jointly and severally referred to as "**Owner**"), for the benefit of TERRA EQUITY, INC., a Texas corporation and/or its successors and assigns ("**Buyer**"), and ORANGE COUNTY, NORTH CAROLINA (the "**County**");

RECITALS

A. Owner is the owner of that certain real property located in Orange County, North Carolina, bearing PIN Number 9862-99-8894 and more particularly described on Exhibit A attached hereto (the "**Property**").

B. Buyer is under contract to purchase the Property and in connection therewith has made and/or intends to make certain applications to the County for land use amendments, map amendments, rezoning, zoning amendments, site plan approval, permits, and other approvals and entitlements necessary or desired in connection with the proposed purchase and/or development of the Property (the "**Entitlement Requests**").

C. Owner has agreed to provide this Authorization to authorize and consent to the Entitlement Requests.

AUTHORIZATION AND CONSENT

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Owner hereby authorizes Buyer to make the Entitlement Requests and hereby consents to the Entitlement Requests. Buyer and the County shall be authorized to rely on this Authorization as to any and all Entitlement Requests made by Buyer.

IN WITNESS WHEREOF, Owner has caused this Authorization to be executed as of the date set forth in the notary acknowledgment below.

LANDMARK MANAGEMENT PARTNERS, LLC

By: H. Nathan Robinson

Its: MEMBER

NOTARY BLOCK TO FOLLOW ON NEXT PAGE

STATE OF NC)
COUNTY OF Orange)

The foregoing instrument was subscribed, sworn to and acknowledged before me this 14th day of May, 2020, by H. Nathan Robinson, as member of Landmark Management Partners, LLC, for and on behalf of such company.

My commission expires: 10/15/2020

Allison E. Lassiter
NOTARY PUBLIC

[SEAL]



FACILITY CARE SERVICES, INC.

By: Mary L. Kernahan
Its: President, FCS

STATE OF New York)
COUNTY OF Steuben)

The foregoing instrument was subscribed, sworn to and acknowledged before me this 15 day
May, 2020, by Mary L. Kernahan as President of Facility Care Servi
ces, for and on behalf of such corporation.

My commission expires: 2/6/2021

Tammie L. Flynn
NOTARY PUBLIC

TAMMIE L. FLYNN
NOTARY PUBLIC-STATE OF NEW YORK
No. 01FL6364021
Qualified in Steuben County
My Commission Expires 02-06-2021

[SEAL]

Exhibit A

Legal Description: Davis Drive Tract (PIN 9863718857)

Beginning from an existing 1.2 inch iron pipe lying on the northern public right of way line of Davis Drive and having North Carolina State Plane Coordinates E:1969412.93' & N:829571.12'; Thence departing said public right of way line of Davis Drive, N 00° 21' 37" W for a distance of 522.88 feet to a point; Thence, S 89° 11' 51" E for a distance of 892.27 feet to a point; Thence, N 89° 03' 10" E for a distance of 148.00 feet to a point; Thence, S 16° 58' 44" E for a distance of 388.54 feet to a point on the western public right of way line of Old NC 86; Thence departing said public right of way line of Old NC 86, S 16° 58' 44" E for a distance of 38.83 feet to the centerline of said public right of way, also being the beginning of a curve; Said curve running along said centerline and turning to the left through an angle of 02° 07' 40", having a radius of 2865.00 feet, and whose long chord bears S 34° 15' 10" W for a distance of 106.39 feet to a point; Thence along said centerline, S 33° 11' 20" W for a distance of 29.69 feet to a point lying on the intersectional centerline of Old NC 86 and Davis Drive, said point also being the beginning of a curve; Thence following the centerline of Davis Drive for the following four (4) calls: along said curve turning to the left through an angle of 09° 19' 27", having a radius of 818.91 feet, and whose long chord bears N 86° 34' 49" W for a distance of 133.12 feet to a point; S 88° 45' 26" W for a distance of 284.67 feet to the beginning of a curve; said curve turning to the left through an angle of 00° 45' 19", having a radius of 5000.00 feet, and whose long chord bears S 88° 22' 47" W for a distance of 65.92 feet to a point; S 88° 00' 07" W for a distance of 602.29 feet to a point; Thence departing said centerline of Davis Drive, N 00° 27' 40" W for a distance of 29.80 feet to the point of beginning, containing 584190 square feet OR 13.411 acres, more or less.

**OWNER AUTHORIZATION AND CONSENT
(LAND USE, REZONING AND ENTITLEMENTS)**

THIS OWNER AUTHORIZATION AND CONSENT ("**Authorization**") is made and entered into as of the date set forth below, by SUZANNE MCGRADY (FKA SUZANNE UPTON) of 11508 Bridgetender Drive, Richmond, VA 23233 ("**Owner**"), for the benefit of TERRA EQUITY, INC., a Texas corporation and/or its successors and assigns ("**Buyer**"), and ORANGE COUNTY, NORTH CAROLINA (the "**County**");

RECITALS

A. Owner is the owner of that certain real property located in Orange County, North Carolina, bearing PIN Number 9863-71-8857 and more particularly described on Exhibit A attached hereto (the "**Property**").

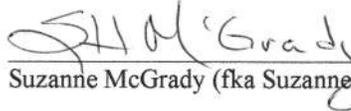
B. Buyer is under contract to purchase the Property and in connection therewith has made and/or intends to make certain applications to the County for land use amendments, map amendments, rezoning, zoning amendments, site plan approval, permits, and other approvals and entitlements necessary or desired in connection with the proposed purchase and/or development of the Property (the "**Entitlement Requests**").

C. Owner has agreed to provide this Authorization to authorize and consent to the Entitlement Requests.

AUTHORIZATION AND CONSENT

NOW, THEREFORE, in consideration of the mutual covenants and promises contained herein and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Owner hereby authorizes and consents to Buyer making the Entitlement Requests. Buyer and the County shall be authorized to rely on this Authorization as to any and all Entitlement Requests made by Buyer.

IN WITNESS WHEREOF, Owner has caused this Authorization to be executed as of the date set forth in the notary acknowledgment below.

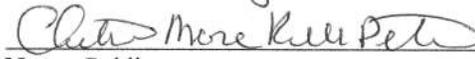

Suzanne McGrady (fka Suzanne Upton)

STATE/COMMONWEALTH OF Virginia

COUNTY OF Henrico

I certify that the following person personally appeared before me this day, acknowledging to me that he or she voluntarily signed the foregoing document for the purpose stated therein and in the capacity indicated: Suzanne McGrady.

Witness my hand and Notarial Stamp/Seal this 14th day of May, 2020.


Notary Public

Print/Type Name: Christena Marie Rulli-Peters

My Commission Expires: Nov. 30, 2023



Exhibit A

Property Description

Being all that certain tract or parcel of land lying and being situate in Hillsborough Township, Orange County, North Carolina, and being more particularly described as:

BEING ALL of that tract of land, containing approximately 100 acres, described in that deed from Marshall L. Cates and wife, Bera D. Cates to C.H. Pegg dated May 19, 1960 and recorded in Book 178, Page 361, Orange County Registry, to which deed reference is hereby made for a more particular description.

LESS AND EXCEPT: (i) that tract of land, containing approximately 8.5 acres, conveyed to the Department of Transportation of the State of North Carolina by deed recorded in Book 394, Page 319, Orange County Registry; and (ii) that tract of land, containing approximately 2.7 acres, conveyed to Allen and Sally Addison by deed recorded in Book 894, Page 637, Orange County Registry.

Said tract of land, less and except the aforementioned two (2) out-conveyances, is more particularly shown and depicted as that tract containing approximately 90.372 acres on that plat entitled "Boundary Survey for Eleanor S. Pegg" recorded in Plat Book 79, Page 117, Orange County Registry.

EXHIBIT F

Research Triangle Logistics Park

Raleigh, NC

Signage Concepts

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Art for Approval

Thank you for your business. Following you will find drawings that have been generated for your review and consent. These drawings represent our interpretations of your request. As the customer you will assume all financial responsibility for products manufactured in compliance with the signed drawings. Please read carefully before signing.

Please inspect these drawings carefully, making sure they are an exact, complete, and accurate reflection of what you are wanting us to build. A mounting detail may also be included. Make certain that it matches the expected conditions of the site and answers any concerns that you or any of your contractors may have. If the drawings meet with your approval please sign them to indicate your approval. If you have any questions or concerns, please contact your DeNyse Representative and they will be more than happy to assist you. If you have changes, please mark up the drawings and get them back to us so that we can make the necessary adjustments.

Upon approval, these drawings will be put into manufacturing and an estimated completion date will be generated and forwarded to you. An estimated completion date is only generated upon receipt of your signed approval. It is important that you approve these drawings in a timely manner to ensure prompt completion of your project.

You will find a Copyright located on the top right-hand corner of each of the following pages. Please note that these documents may not be used to secure pricing or bids without the express written consent from a DeNyse Representative.

Colors & Finishes

Colors shown here may not exactly match manufacturers color chart swatch or actual sample. Client to either provide samples or specifications for custom colors prior to production or approve DeNyse color samples or color specifications

- C1** TBD
- C2** TBD
- C3** Matthews 41342SP "Brushed Aluminum"
- C4** White

Fonts Used

Client Artwork (vector)

DeNyse

SIGNAGE & ARCHITECTURAL ELEMENTS

1.800.941.7446
denyseco.com

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park/Master
Sign Plan v4

- Concept
- Preliminary
- Production



Side B



Main Id

Scale
1/2" = 1'-0"



Customer Signature Required



Colors & Finishes

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- C1** TBD
- C2** TBD
- C3** Matthews 41342SP "Brushed Aluminum"
- C4** White

Fonts Used

Client Artwork (vector)

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park\Master
Sign Plan v4

- Concept
- Preliminary
- Production



Secondary Id

Scale
1/2" = 1'-0"





Colors & Finishes

Colors shown here may not exactly match manufacturers color chart swatch or actual sample. Client to either provide samples or specifications for custom colors prior to production or approve DeNyse color samples or color specifications

- C1** TBD
- C2** TBD
- C3** Matthews 41342SP "Brushed Aluminum"
- C4** White

Fonts Used

Client Artwork (vector)
Bebas Neue

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park\Master
Sign Plan v4

- Concept
- Preliminary
- Production



Scale
3/4" = 1'-0"





Colors & Finishes

Colors shown here may not exactly match manufacturers color chart swatch or actual sample. Client to either provide samples or specifications for custom colors prior to production or approve DeNyse color samples or color specifications

- C1** TBD
- C2** TBD
- C3** Matthews 41342SP "Brushed Aluminum"
- C4** White

Fonts Used

Client Artwork (vector)
Bebas Neue

DENYSE

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park\Master
Sign Plan v4

- Concept
- Preliminary
- Production



Scale
3/4" = 1'-0"



Customer Signature Required

Directional Sign

Colors & Finishes

Colors shown here may not exactly match manufacturers color chart swatch or actual sample. Client to either provide samples or specifications for custom colors prior to production or approve DeNyse color samples or color specifications

- C1 ● TBD
- C2 ● TBD
- C3 ● Matthews 41342SP "Brushed Aluminum"
- C4 ○ White
- C5 ● Standard DOT Colors

DeNyse

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

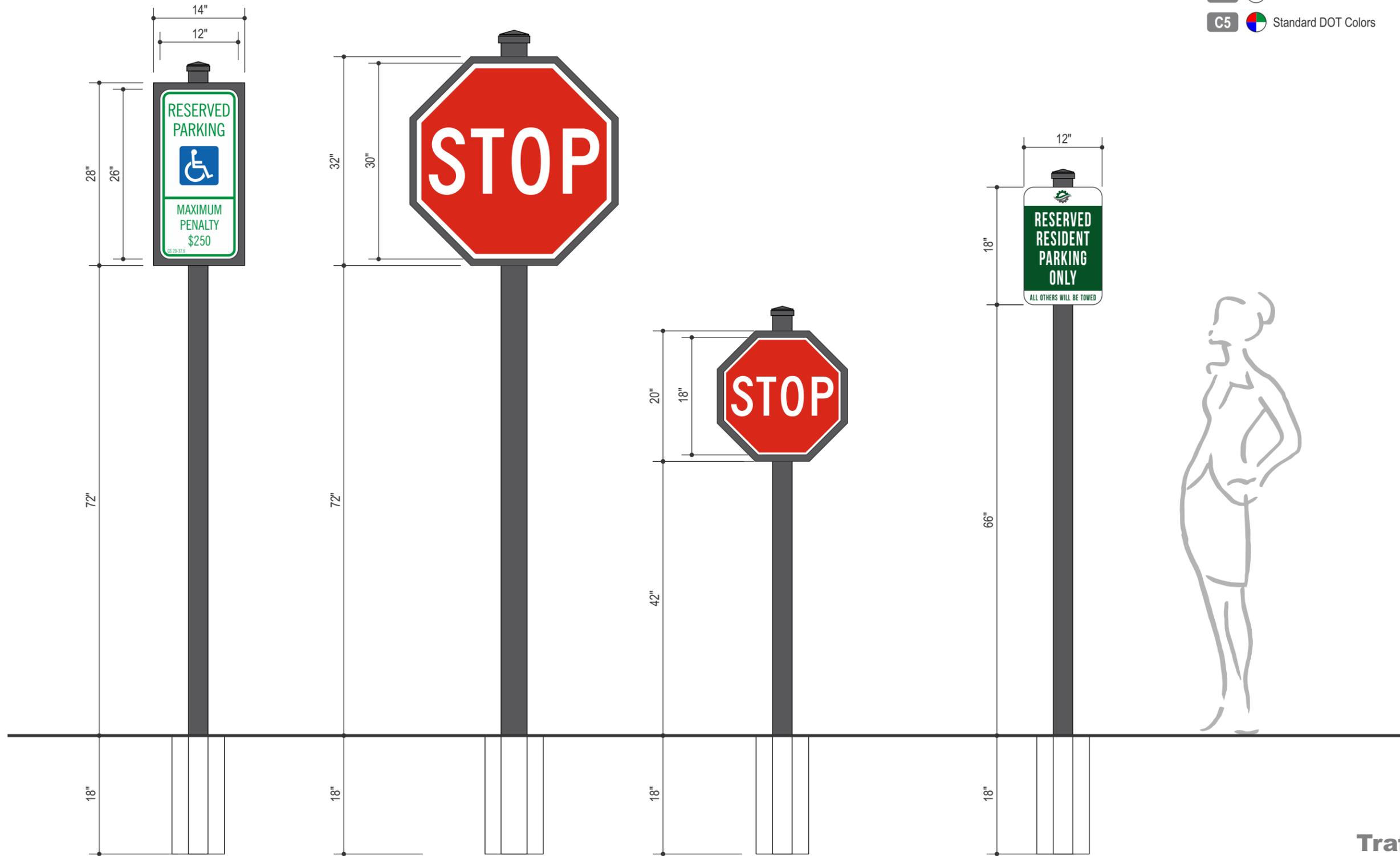
Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park/Master
Sign Plan v4

- Concept
- Preliminary
- Production



Scale
3/4" = 1'-0"

Customer Signature Required

Traffic Signs

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Sample Letter

Colors & Finishes

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C4 White

Fonts Used

Bebas Neue



Sample Text

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1 06.03.2020 jd
06.04.2020 rs

Filepath
Research Triangle
Logistics Park\Master
Sign Plan v4

- Concept
- Preliminary
- Production

Plastic Formed Non-Illuminated Building Address

Scale
1/2" = 1'-0"



Customer Signature Required



Inventory

- 1 Main Id
- 2 Secondary Id
- 3 Secondary Id
- 4 Stop Sign - 30"
- 5 Stop Sign - 30"
- 6 Stop Sign - 30"
- 7 Directional
- 8 Directional
- 9 Directional
- 10 Stop Sign - 24"
- 11 Stop Sign - 24"
- 12 Stop Sign - 24"
- 13-27 Stop Sign - 24"
- 28-31 Building Directory
- 32-27 Handicapped Parking - Bldg A
- 38-40 Handicapped Parking - Bldg B
- 41-44 Handicapped Parking - Bldg C
- 45-46 Handicapped Parking - Bldg D
- 47-50 Bldg Address Letter - Bldg A
- 51-54 Bldg Address Letter - Bldg B
- 55-58 Bldg Address Letter - Bldg C
- 59-62 Bldg Address Letter - Bldg D

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Management Company
N/A

Property Name & Address
Research Triangle
Logistics Park
Raleigh, NC

Opportunity Number
36383

DeNyse Representative
Richard Swartz

Designer
J. Dew

Date
06.02.2020

Revision Date

1	06.03.2020 jd
	06.04.2020 rs

Filepath
Research Triangle
Logistics Park/Master
Sign Plan v4

- Concept
- Preliminary
- Production

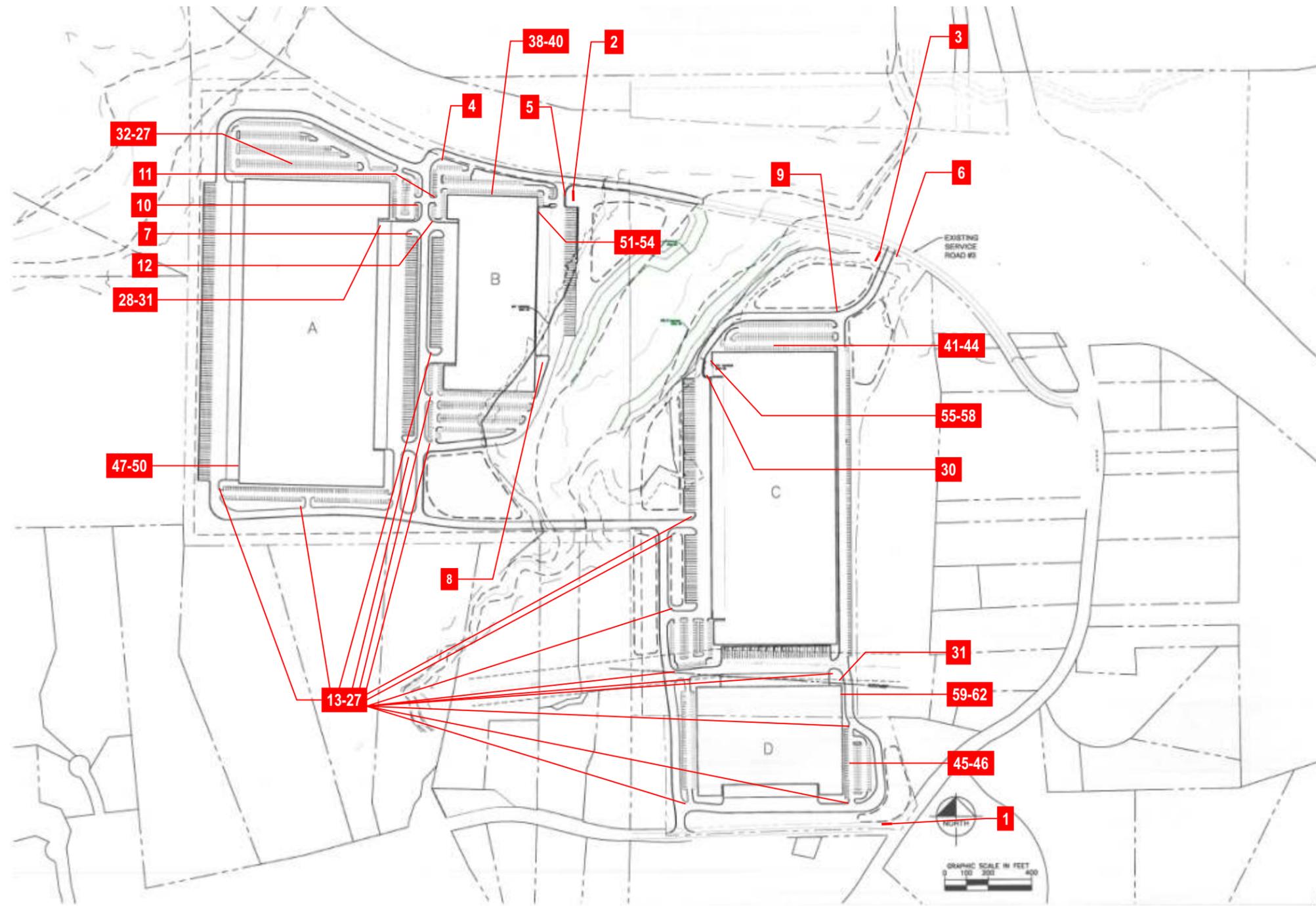


EXHIBIT G



An Environmental Assessment (EA) shall be required for each individual parcel proposed for development consistent with applicable criteria as detailed within the Unified Development Ordinance (UDO)

SUBJECT PARCEL:

Address: N/A, Undeveloped Tracts of Land

Parcel Identification Number (PIN): 9863718857 (Parcel #1), 9863916573

(Parcel #2), 9862998894 (Parcel #3)

Acreage: 160 acres Township: Hillsborough (4) – Parcels #1 and #2
Chapel Hill (7) – Parcel #3

Zoning:

Zoning District: MPD -CZ (Parcels #1 and #2), R1 & RB (Parcel #3)

Watershed Overlay: Lower Eno, Unprotected

Other Overlay: Major Transportation Corridor (MTC) and
Special Flood Hazard Area (SFHA)

Owner Information:

Parcel: 9863718857 (Parcel #1)

Name: Suzanne McGrady Home Phone: _____

Address: 11508 Bridgetender Drive Cell Phone: _____

Richmond, Virginia 23233 E-mail: _____

Parcel: 9863916573 (Parcel #2)

Name: Christy Bailey and John Clayton Home Phone: _____

Address: 7510 Country Lane Cell Phone: _____

Rougemont, NC 27572 E-mail: _____

Parcel: 9862998894 (Parcel #3)

Name: Facility Care Services Inc. Home Phone: _____

Address: 19 Harrier Circle Cell Phone: _____

Rochester, NY 14623 E-mail: _____

Applicant Information: (same as owner)

Name: Chris Bostic, Kimley-Horn Work Phone: (919) 653-2927

Address: 421 Fayetteville Street, Suite 600 Cell Phone: (919) 623-0414

Raleigh, NC 27601 E-mail: Chris.Bostic@kimley-horn.com

Official Use Only:

Date Application Filed: _____ Fee Collected: _____

Accepted by: _____ Permit Case Number: _____

Zoning: _____ Watershed: _____ Overlay: _____

I. GENERAL SITE INFORMATION

A. Adjacent property:

Zoning: 9863718857 (Parcel #1)

North: EDH-5, MPD-CZ

South: R1-Rural Residential

East: MPD-CZ

West: R1-Rural Residential

Land Use: 9863718857 (Parcel #1)

North: Interstate 40

South: Single-Family / Undeveloped

East: Single-Family / Undeveloped

West: Single-Family / Undeveloped

Zoning: 9863916573 (Parcel #2)

North: MPD-CZ

South: R1-Rural Residential

East: MPD-CZ, R1-Rural Residential

West: EDH-2, EDH-5

Describe: Based on previously conducted studies on the parcels and a review of publicly available data, the floodplain of Cates Creek enters the project study area in the upper northwest corner of parcel #1, flowing southwest to northeast. One unnamed pond is adjacent/abutting the northwest corner of parcel #1. Another unnamed tributary and its floodplain are located in the southeast section of parcel #1 and northwest section of parcel #2. There are no wetlands, streams or floodplains are located in parcel #3. Hydrologic features were previously delineated in 2017, and no wetlands were identified on available mapping. The Total areas of hydrologic features between the three parcels is as follows:

- Streams: 2,342 LF
- Floodplains: 11.3 ac.
- Buffers: Zone 1 - 133,099 SF, Zone 2 - 87,797 SF

(Attach additional sheets if needed)

D. Does the property contain any of the following Inventory of Natural or Cultural Resources? (As identified in the “Inventory of Sites of Cultural, Historical, Recreational, Biological, and Geological Significance in the Unincorporated Portions of Orange County” or the “Inventory of Natural Areas and Wildlife Habitats of Orange County, North Carolina”.)

	<u>Yes</u>	<u>No</u>
1. Cemeteries	_____	X
2. Archaeological sites	_____	X
3. Historic sites	_____	X
4. Areas of geological significance	_____	X
5. Designated natural areas	X	_____
6. Designated habitat	_____	X

For each “yes” answer above, please indicate the location on site plan and complete Attachment A.

II. PROJECT DESCRIPTION

A. Describe proposed use of property:

Development of an industrial park for manufacturing, warehousing, shipping and distribution services. The industrial park will be composed of a minimum of 4 industrial/warehouse buildings with associated parking and roadways. The development will be located on three separate parcels.

B. Number of lots: N/A

C. Number of structures: 4

D. Estimated square footage of area to be graded for development of attached residential units (excluding roads, but including parking areas) N/A

E. Estimated square footage of area to be graded for non-residential use (excluding roads)

Building Graded Area: 2,331,565 SF

Parking Graded Area: 2,075,955 SF

F. Estimated area to be graded for roads: 336,570 SF

Road Type: Public _____ Private X _____

Class A _____

Class B _____

Total road length 5,636 LF

III. STATE PERMITS REQUIRED

1. **Does the project involve the mining of earth products?** No

If so, how many cubic feet of material are expected to be excavated?

n/a

Has an application for a Mining Permit been submitted to NCDRCD?

n/a

Please attach map indicating expected extent of proposed activity.

2. Does the project involve generation or storage of hazardous or toxic wastes, as identified by the Environmental Protection Agency? No

Describe the wastes to be generated. n/a

How much material is expected to be generated per month?

n/a

Will any material be treated onsite? n/a

Volume? n/a

Will any material be stored onsite? n/a

Volume? n/a

Where will disposal of the material take place?

n/a

How will materials be transported to the disposal site?

n/a

What measures are proposed to protect water quality and air quality in case of spills?

n/a

3. **Will the project involve a land application system for treatment of wastewater?** No

If yes, describe n/a

Has an application for a non-discharge permit been submitted to the NC Department of Environmental Management or Orange County Department of Environmental Health? n/a

4. **Is a septic tank system proposed which as a design capacity of more than 3000 gallons per day?** No

If yes, describe n/a

Has an application for a non-discharge permit been submitted to the NC Department of Environmental Management or Orange County Department of Environmental Health?

5. **Does the activity involve sludge disposal?** No

If yes, where is the source of the sludge? n/a

Describe where and how the sludge is being disposed.

n/a

Has a NPDES permit from the NC Division of Environmental Management been issued? n/a

6. **Water Usage**

[Note – employee numbers are unknown at this point, but will be provided to Orange County once determined. Projected land use will not utilize any production or process water as no production will occur on the parcels.]

a. Estimated no. of employees ____ x 25 gpd = ____ gpd

b. Estimated water use for climate control = ____ gpd

c. Process water

_____ % consumed
_____ % discharged to septic system
_____ % discharged to surface (including storm
sewers) (describe: _____)
_____ % evaporated
_____ % reclaimed/reused
_____ % other
100%

d. Water used for cooling, heating, etc., in association with
production or manufacturing

_____ % reused
_____ % consumed
_____ % discharged
(describe: _____)
100%

_____ gpd
Total Water Usage

e. Describe source of water
Water will be provided to the development by a water
extension/connection from existing Hillsborough utilities

ATTACHEMENT A
TO BE COMPLETED ONLY IF INVENTORY SITES ARE IDENTIFIED IN I.E.

(ATTACH ADDITIONAL SHEETS IF NECESSARY)

(1) a. Impact on Resource from Proposed Development

- Minor impacts will result from the proposed development due to a road crossing necessary to provide connectivity between the four proposed buildings. The crossing has been designed as a perpendicular crossing to minimize impacts, and is located higher in the watershed where the stream is smaller to further reduce impact quantities proposed. Unavoidable impacts to streams, riparian buffers, and floodplains are as follows:

Streams: 68 linear feet (LF)

Floodplains 0.26 acres (ac.)

Floodway: 2,759 square feet (SF)

Buffer Zone 1: 3,899 square feet (SF)

Buffer Zone 2: 4,838 square feet (SF)

b. Proposed Mitigation

Compensatory mitigation for stream and riparian buffer impacts is not anticipated to be required by the US Army Corps of Engineers or the NC Division of Water Resources based on the small quantity of impacts. Perpendicular road crossings of less than 1/3rd of an acre and less than 150 LF are considered “allowable” per Neuse River Basin Riparian Buffer Rules. Floodplain impacts will be minor, and a LOMR has been prepared and submitted to the NC Floodplain Management Program and is currently under review.

STATEMENT BY APPLICANT:

I certify that the information presented by me in this application is accurate to the best of my knowledge, information, and belief.

Signature of applicant: _____

DocuSigned by:
Christopher O Bostic
3971981624734DD...

Date: 6/3/2020

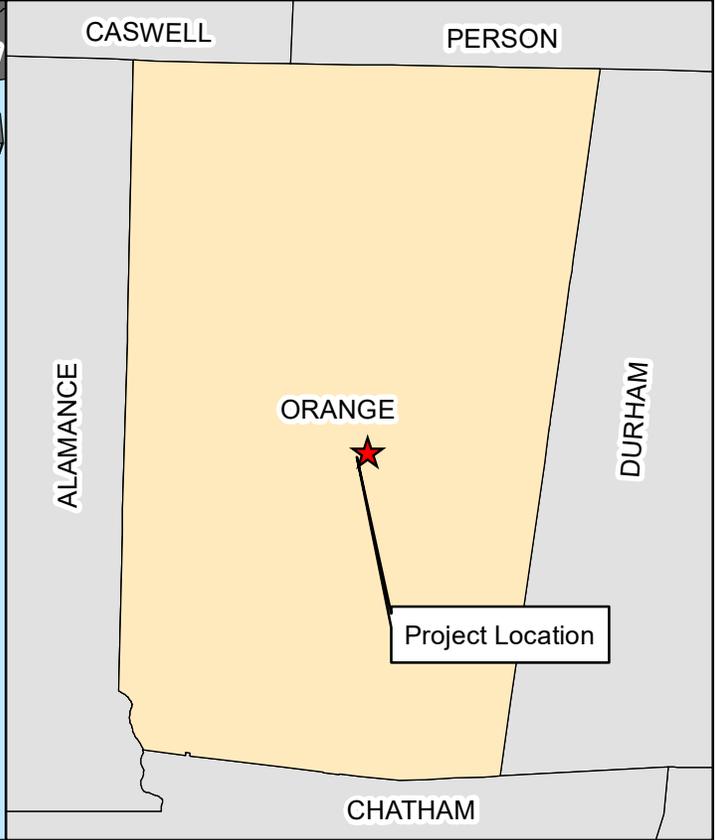
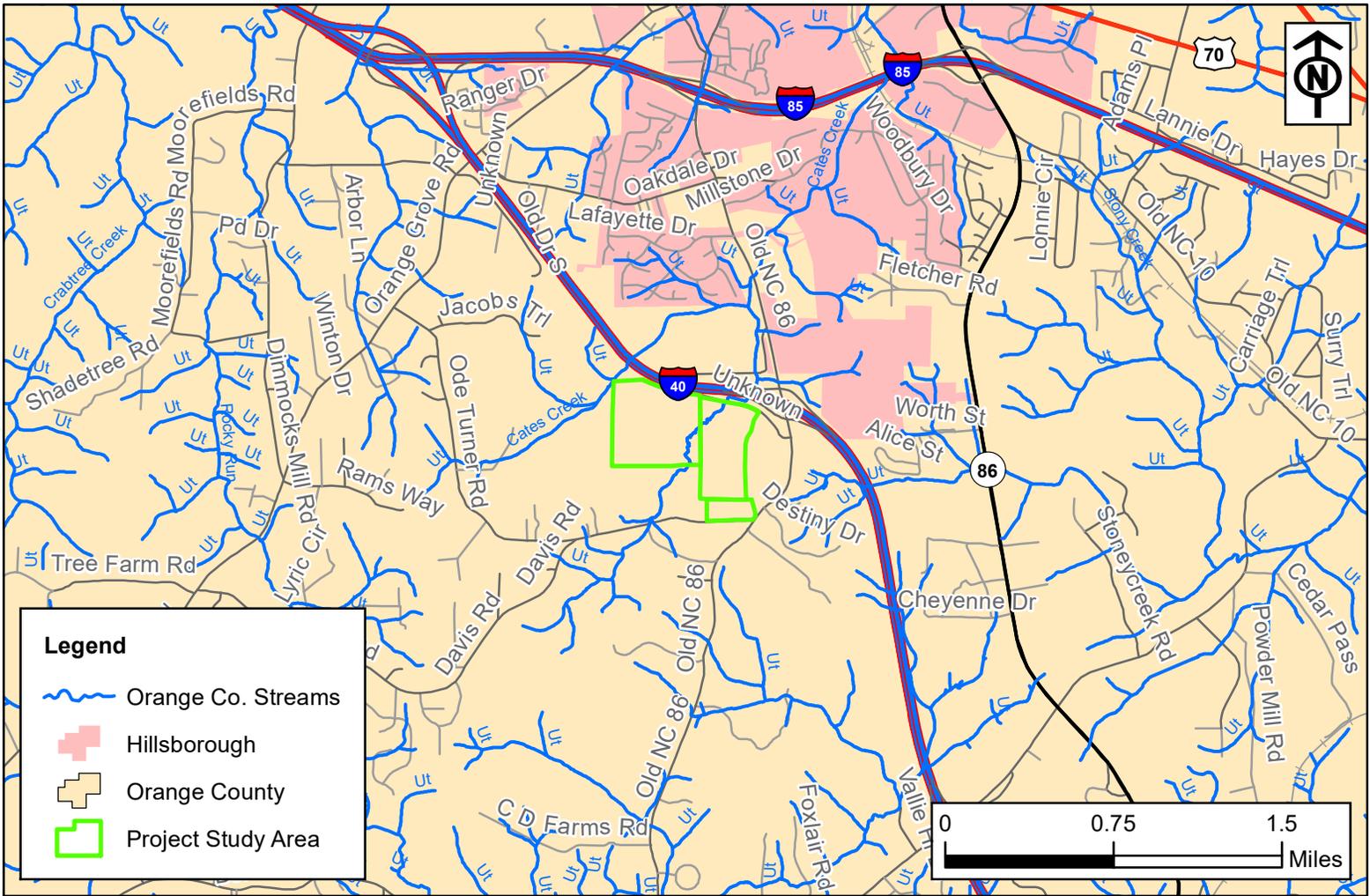
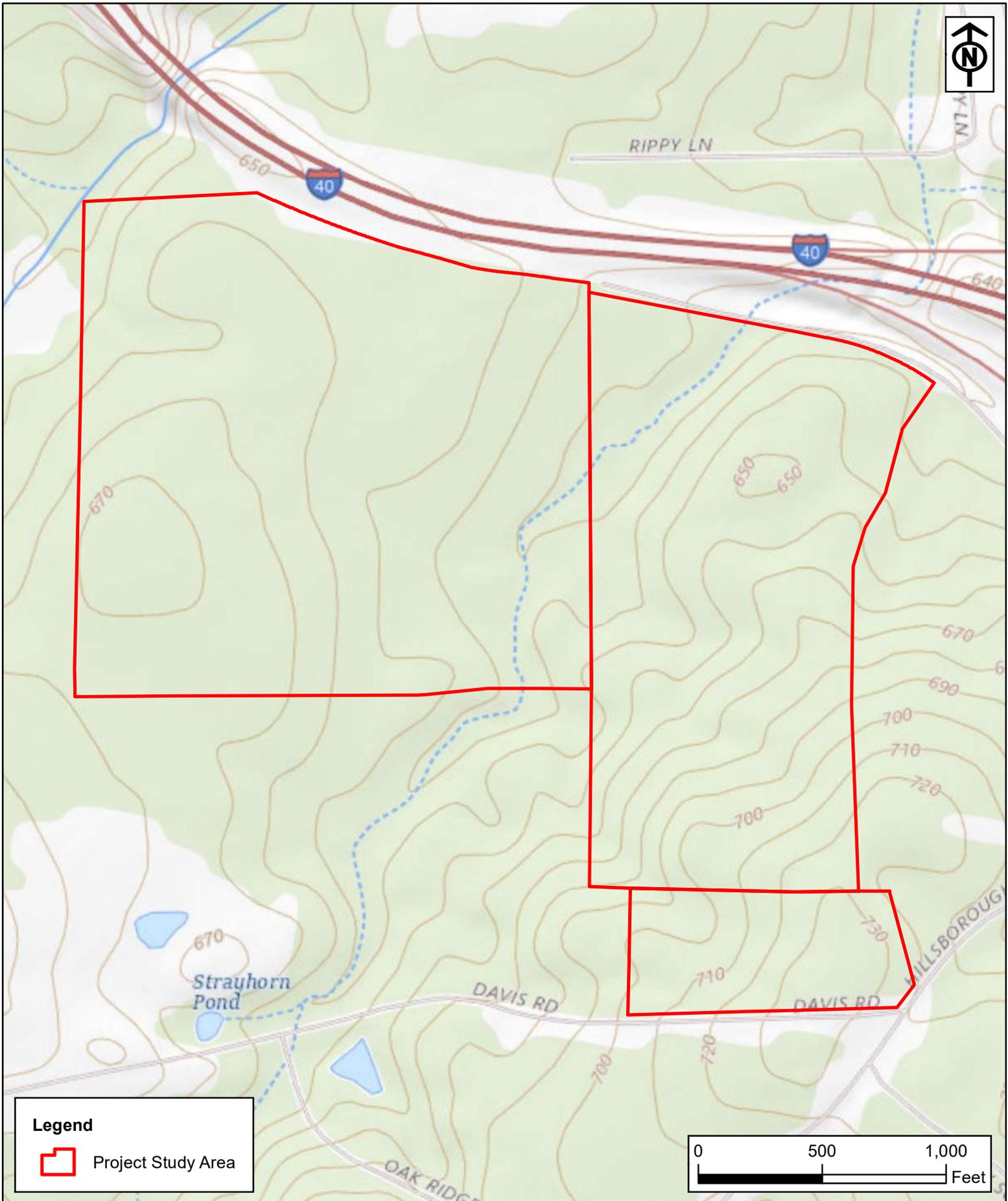
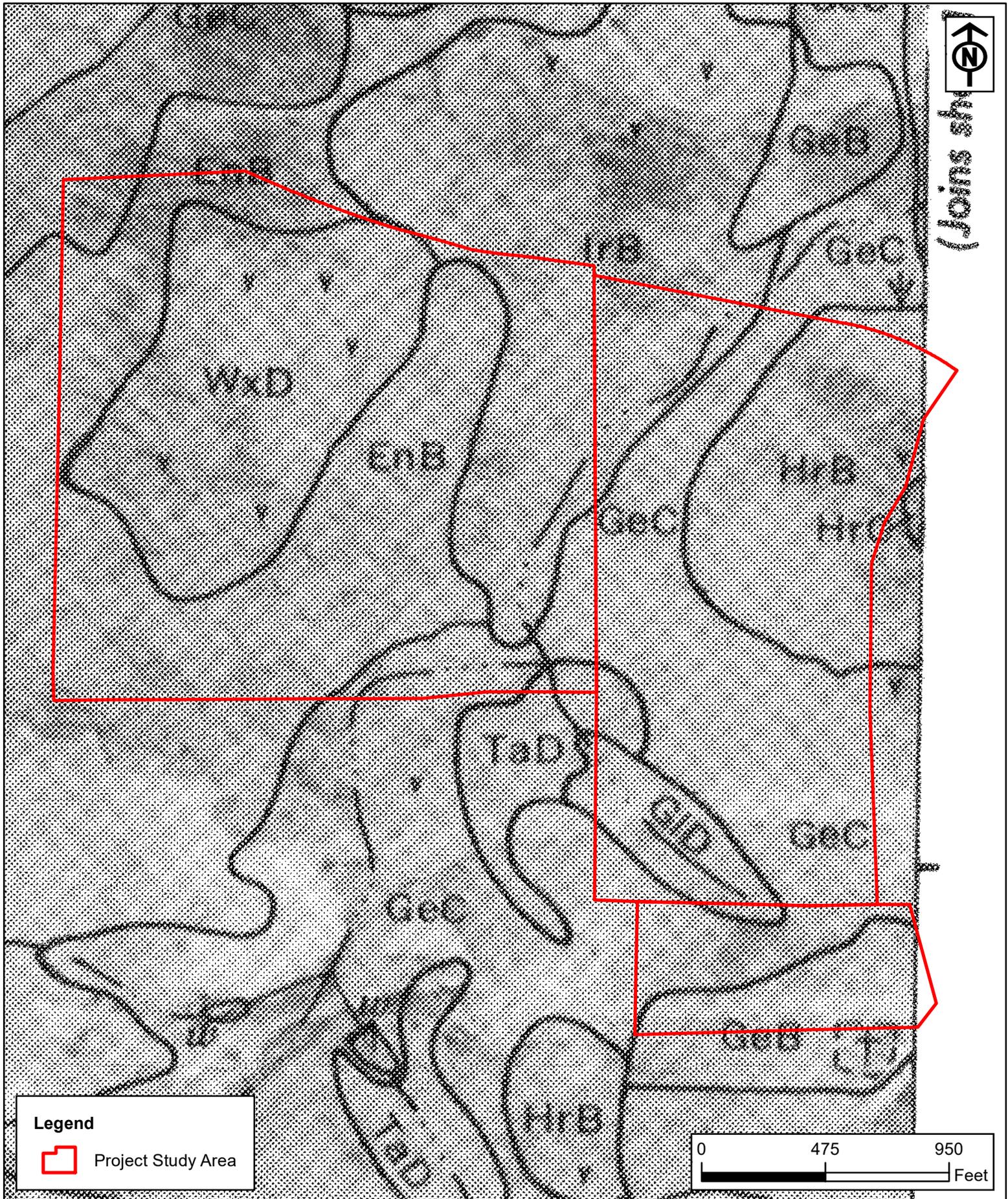


Figure 1: Vicinity Map
 Hillsborough Industrial Site
 Hillsborough and Chapel Hill, Orange County, NC
 May 2020

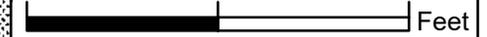


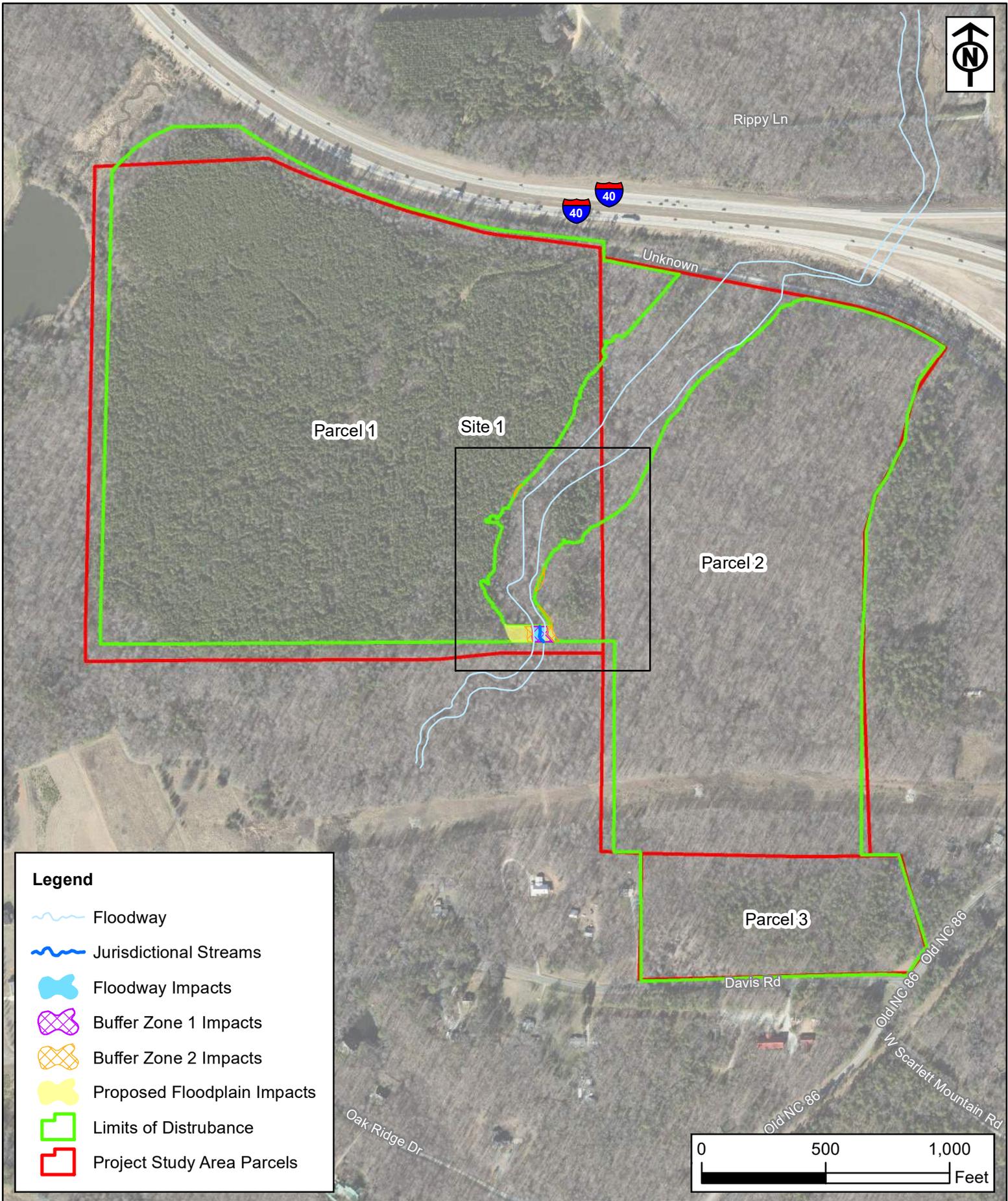




Legend

 Project Study Area

0 475 950
 Feet

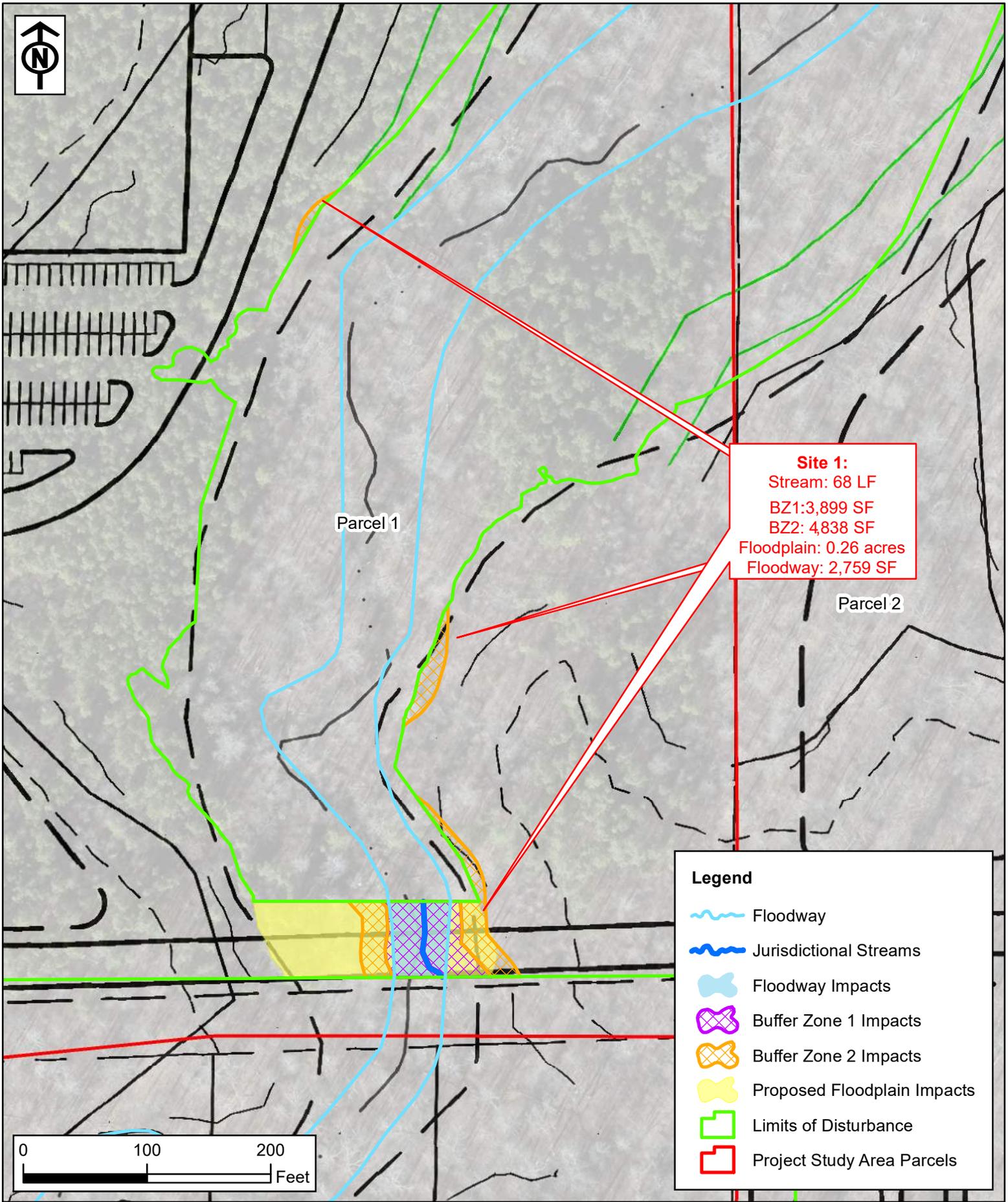


Legend

-  Floodway
-  Jurisdictional Streams
-  Floodway Impacts
-  Buffer Zone 1 Impacts
-  Buffer Zone 2 Impacts
-  Proposed Floodplain Impacts
-  Limits of Disturbance
-  Project Study Area Parcels

Figure 5: Impact Drawings

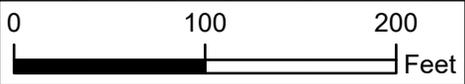
Hillsborough Industrial Site
Hillsborough, Orange County, NC
June 2020



Site 1:
Stream: 68 LF
BZ1: 3,899 SF
BZ2: 4,838 SF
Floodplain: 0.26 acres
Floodway: 2,759 SF

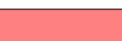
Legend

- Floodway
- Jurisdictional Streams
- Floodway Impacts
- Buffer Zone 1 Impacts
- Buffer Zone 2 Impacts
- Proposed Floodplain Impacts
- Limits of Disturbance
- Project Study Area Parcels



Plotted By: Myers, Chase
 Layout: PS-1 - PRELIMINARY SITE LAYOUT - May 21, 2020 - 02:57:12pm
 C:\SubDrives\Drive\REAL_DEV\Marketing Proposals\Barrister Commercial\Hillsborough Industrial Site\CAD\Exhibits\2020_05-13_Slope Exhibit\2020-05-13_Graded Area.dwg
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GRADED AREA TABLE		
COLOR	AREA TYPE	AREA (SF)
	BUILDING GRADED AREA	2,331,565 SF
	PARKING GRADED AREA	2,075,955 SF
	ROAD GRADED AREA	336,570 SF
	STORMWATER BMP AREA	498,705 SF
	OPEN SPACE AREA	1,792,757 SF

No.	REVISIONS	DATE	BY

Kimley»Horn
 © 2020 KIMLEY-HORN AND ASSOCIATES, INC.
 421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
 PHONE: 919-677-2000
 WWW.KIMLEY-HORN.COM

KHA PROJECT	013560000
DATE	05/18/2020
SCALE	AS SHOWN
DESIGNED BY	JCB
DRAWN BY	JCB
CHECKED BY	COB

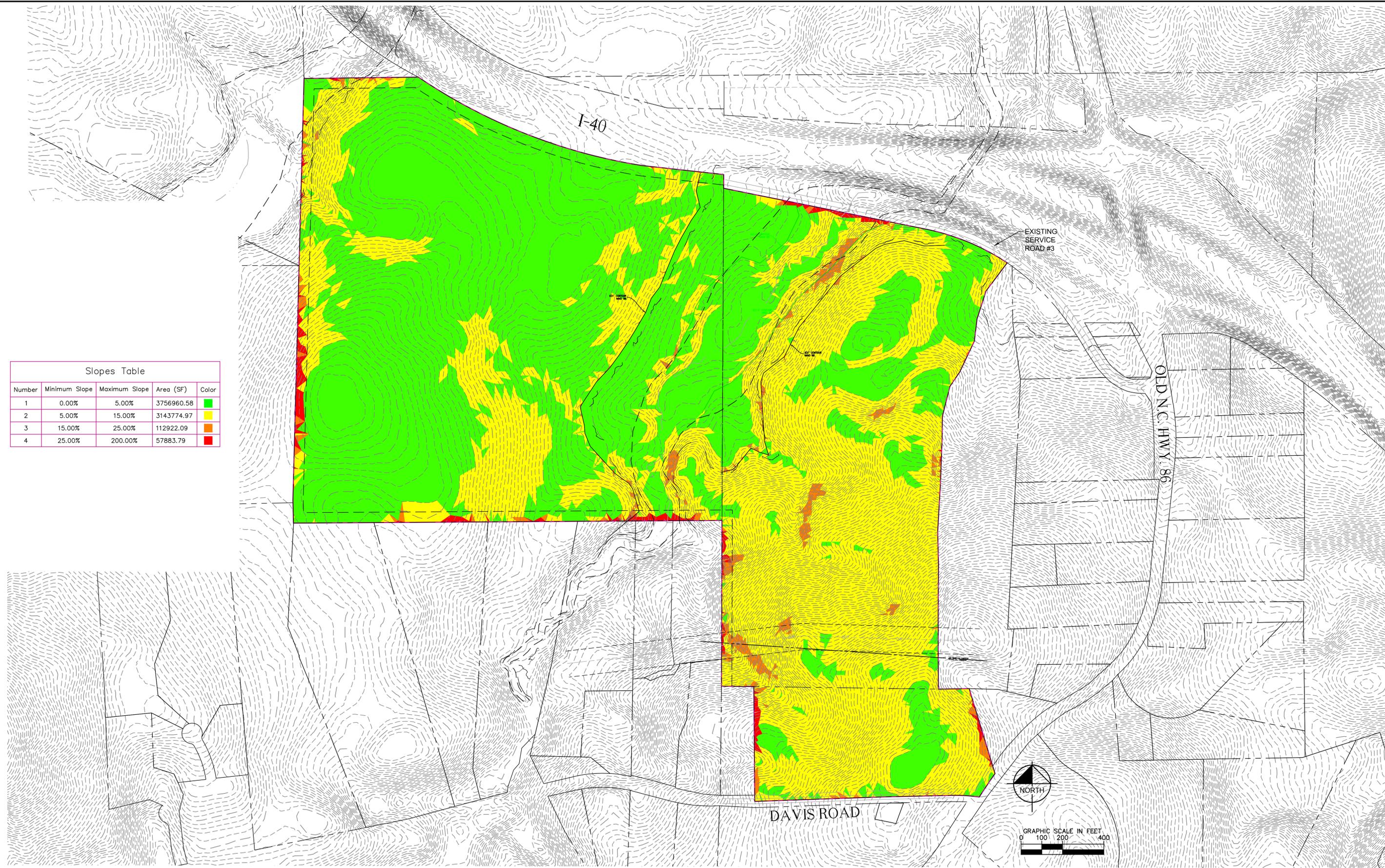
HILLSBOROUGH INDUSTRIAL SITE
 FOR
BARRISTER CONSTRUCTION CORPORATION
 I-40 & OLD N.C. 86
 HILLSBOROUGH ORANGE COUNTY NORTH CAROLINA

PRELIMINARY
 NOT FOR CONSTRUCTION

GRADED AREA EXHIBIT

SHEET NUMBER
GE-1

Plotted By: Myers, Chance
 Date: May 19, 2020 05:35:17pm
 C:\SubDrives\Drive\RAL\DEVA_Marketing\Proposals\Barrister Commercial Hillsborough Industrial Site\CAD Exhibits\2020-05-13_Slope Exhibit\SI-1_Slope Exhibit.dwg
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Slopes Table				
Number	Minimum Slope	Maximum Slope	Area (SF)	Color
1	0.00%	5.00%	3756960.58	Green
2	5.00%	15.00%	3143774.97	Yellow
3	15.00%	25.00%	112922.09	Orange
4	25.00%	200.00%	57883.79	Red

No.	REVISIONS	DATE	BY

Kimley»Horn
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 421 FAYETTEVILLE STREET, SUITE 600, RALEIGH, NC 27601
 PHONE: 919-677-2000
 WWW.KIMLEY-HORN.COM

KHA PROJECT	013560000
DATE	05/18/2020
SCALE	AS SHOWN
DESIGNED BY	JCB
DRAWN BY	JCB
CHECKED BY	COB

HILLSBOROUGH INDUSTRIAL SITE
 FOR
BARRISTER CONSTRUCTION CORPORATION
I-40 & OLD N.C. 86
 HILLSBOROUGH ORANGE COUNTY NORTH CAROLINA

PRELIMINARY
 NOT FOR CONSTRUCTION

EXISTING SLOPE EXHIBIT

SHEET NUMBER
SI-1

EXHIBIT H



Research Triangle Logistics Park Traffic Impact Analysis

June 4, 2020

Prepared for:

Terra Equity Inc.
A Division of Barrister Commercial Group
3810 Springhurst Boulevard, Suite 120
Louisville, KY 40241

Prepared by:

Stantec Consulting Services Inc.
801 Jones Franklin Road
Suite 300
Raleigh, NC 27606

File: 171002240

Sign-off Sheet

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Prepared by 

(signature)

Maggie Rogers

Reviewed by 

(signature)

Matt Peach, PE, PTOE

Approved by 

(signature)

Christa Greene, PE



6/4/2020

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Executive Summary

The Research Triangle Logistics Park is a proposed development located along Old NC 86 in Hillsborough, Orange County, NC. The site encompasses the area along the west side of Old NC 86, between Davis Road and Interstate 40 (I-40) and is anticipated to be completed in 2023. The site is envisioned to consist of 2,251,200 square feet of warehouse.

At build out, the proposed development is anticipated to generate 3,648 new trips per average weekday. In the AM and PM peak hours, the development will generate approximately 320 AM peak hour trips (247 entering and 73 exiting) and 326 PM peak hour trips (88 entering and 238 exiting).

Access to the proposed development is expected to be provided by the existing Service Road; which parallels I-40, and Davis Road. There are three (3) proposed driveways along the Service Road and one driveway proposed for Davis Road.

The purpose of this report is to evaluate the development in terms of projected vehicular traffic conditions, evaluate the ability of the adjacent roadways and multimodal facilities to accommodate the additional traffic and to recommend transportation improvements needed to mitigate congestion that may result from additional site traffic. This report presents trip generation, trip distribution, traffic analyses, and recommendations for improvements needed to meet anticipated traffic demands. This report examines the following scenarios for the AM and PM peak hours:

- 2020 Existing
- 2023 No-Build
- 2023 Build
- 2023 Build-Improved

Capacity analyses for the AM and PM peak hours in each scenario were performed for the following existing intersections:

- Old NC 86 at Waterstone Drive / Rippy Lane;
- Old NC 86 at I-40 Westbound Ramp;
- Old NC 86 at I-40 Eastbound Ramp;
- Old NC 86 at Service Road; and
- Old NC 86 at Davis Road.

Table ES-1 shows a summary of the delays and levels of service for the study area intersections. The following are observations resulting from the traffic analysis.

Heavy left-turning traffic is noted on the southbound approach to the intersection of Old NC 86 at the I-40 Eastbound Ramp. The proposed development does not add vehicles to this turn. The analysis of this proposed signal is performed conservatively using protected-only left-turn treatments per North Carolina Department of Transportation Congestion Management *Capacity Analysis Guidelines*. It is likely that this left-turn will be designed and operated with a flashing yellow arrow; which would improve operations.

Queues were observed to extend along Old NC 86 from the I-40 Eastbound ramps beyond the Service Road. This impediment creates longer queues on the Service Road. As discussed previously, operating the southbound left-turn

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

at the intersection of Old NC 86 at I-40 Eastbound Ramp with a flashing yellow arrow would allow more efficient left-turn operation in addition to increasing the green time given to the northbound through movement. This reallocation of green time would lessen the time during which queues block left-turning traffic from the Service Road onto Old NC 86. Furthermore, if long delays occur during peak periods, it is possible for traffic exiting the development to utilize access onto Davis Road.

It should be noted that the southbound right-turn from Old NC 86 onto the Service Road meets the requirements for an exclusive right-turn lane according to the chart contained in the North Carolina Department of Transportation Policy on Street and Driveway Access to North Carolina Highways. A right-turn lane is not recommended as the right-of-way does not appear to be available to construct this lane. Delay is anticipated to be minimal on this approach as the southbound right-turn is free-flowing.

No improvements are recommended at the intersection of Old NC 86 at I-40 Westbound ramps. The westbound left-turn operates at LOS F with the addition of the proposed development traffic. However, SimTraffic maximum observed queues are less than the current 225 feet of provided storage in both the AM and PM peak hours. It is not uncharacteristic of stop-controlled approaches to unsignalized intersections to operate at failing levels of service during the peak hours and it should be noted that the westbound right-turn flows freely. It should be noted that all other movements operate at LOS B or better at this intersection.

Using the traffic analysis presented herein, recommendations are provided to mitigate the impacts associated with the proposed development. With the recommended improvements in-place all study intersections and approaches operate at LOS D or better during both peak hours; with three (3) exceptions:

- The westbound left-turn from the I-40 Westbound ramp onto Old NC 86 operates at LOS F. Stop-controlled approaches to intersections often operate with longer delays during peak hours. Additionally, the analysis shows that the existing turn-lane storage is not exceeded.
- The eastbound and northbound approaches to the intersection of Old NC 86 at I-40 Eastbound ramp operates at LOS E. However, the overall LOS at this intersection is D.
- The eastbound approach of the Service Road onto Old NC 86 operates at LOS E. Stop controlled approaches to intersections often operate with longer delays during peak hours.

The analysis presented herein is conservative as it assumes that a significant portion of Waterstone is completed by the time the proposed development is opened in 2023. Furthermore, NCDOT has two (2) planned projects in the area in U-5845 (Churton Street Widening) and I-3306A (I-40 Widening) that will make further improvements to transportation infrastructure within the study area.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Figure ES-1: Site Plan

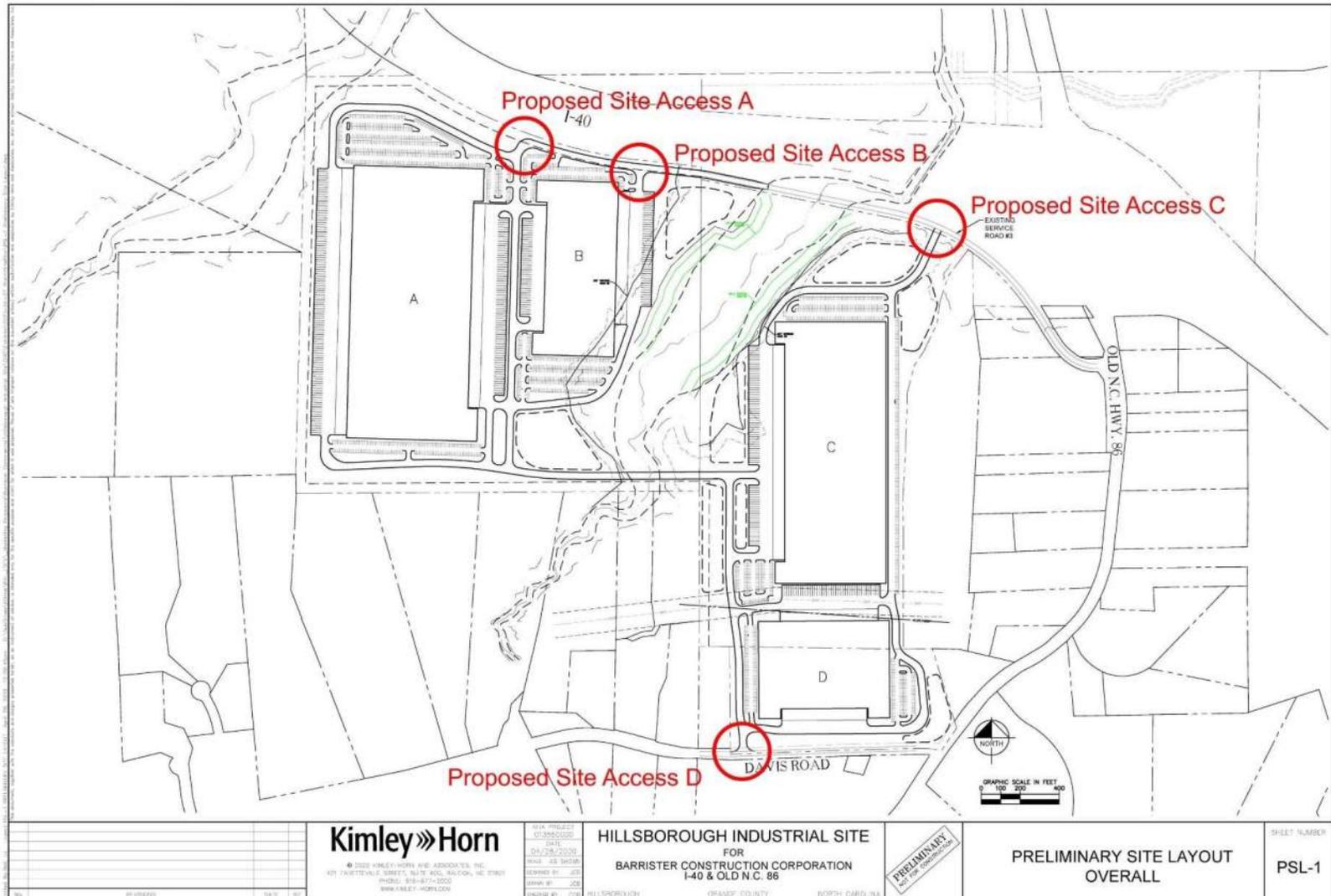


Table ES-1: Level of Service & Delay Summary

Intersection	Approach	Existing Intersection Control	Proposed Intersection Control	2020 Existing		2023 No-Build		2023 Build		2023 Build-Improved	
				AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)	AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)	AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)	AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)
Old NC 86 at Waterstone Drive / Rippy Lane	Overall Intersection	Signalized	Signalized	B (16.4)	B (16.4)	C (21.2)	C (22.6)	C (21.3)	C (22.7)		
	EB Approach			D (43.4)	D (43.4)	D (43.5)	D (43.6)	D (43.5)	D (43.6)		
	WB Approach			C (26.1)	C (31.7)	C (28.5)	C (32.2)	C (29.6)	C (32.3)		
	NB Approach			B (10.4)	B (11.3)	B (14.3)	B (16.5)	B (14.4)	B (17.1)		
	SB Approach			B (17.9)	B (13.5)	C (23.7)	C (21.4)	C (23.1)	C (21.2)		
Old NC 86 at I-40 WB Ramps	Overall Intersection	One-Way Stop Controlled	Signalized	A (1.0)	A (1.6)	A (1.0)	A (1.7)	A (5.5)	A (5.2)		
	WB Approach			C (21.9)	C (22.0)	D (30.2)	D (34.3)	F (86.6)	F (96.5)		
	NB Left-Turn			A (9.9)	A (9.9)	B (11.3)	B (11.8)	B (12.0)	B (13.0)		
	SB Approach			A (0.0)							
Old NC 86 at I-40 EB Ramps	Overall Intersection	One-Way Stop Controlled	Signalized	F (51.2)	A (7.0)	F (###)	F (158.3)	F (###)	F (268.2)	D (50.9)	D (45.8)
	EB Approach			F (###)	F (54.6)	F (###)	F (###)	F (###)	F (###)	E (62.7)	E (55.4)
	NB Approach			A (0.0)	E (77.7)	E (59.8)					
	SB Left-Turn			B (12.1)	A (9.8)	C (15.9)	B (3.1)	C (17.9)	C (15.3)	C (32.6)	C (34.8)
Old NC 86 at Service Road	Overall Intersection	One-Way Stop Controlled	One-Way Stop Controlled	A (0.2)	A (0.2)	A (0.2)	A (0.2)	A (1.6)	A (7.5)	A (1.5)	A (6.2)
	EB Approach			B (13.1)	B (13.5)	B (13.8)	B (14.4)	D (25.2)	E (48.5)	C (23.9)	E (40.3)
	NB Left-Turn			A (8.0)	A (8.2)	A (8.0)	A (8.3)	A (8.8)	A (8.6)	A (8.8)	A (8.6)
Old NC 86 at Davis Road	Overall Intersection	One-Way Stop Controlled	Signalized	A (4.8)	A (2.3)	A (5.2)	A (2.4)	A (7.2)	A (4.6)	B (11.3)	A (9.4)
	EB Approach			C (21.1)	C (17.2)	C (24.8)	C (19.4)	D (34.7)	D (28.5)	C (23.1)	C (23.3)
	NB Left-Turn			A (8.0)	A (8.3)	A (8.1)	A (8.4)	A (8.3)	A (8.6)	A (9.4)	A (7.9)
	SB Approach			A (0.0)	A (7.4)	A (6.1)					
Service Road at Warehouse A Driveway	Overall Intersection		One-Way Stop Controlled					A (1.7)	A (4.4)		
	EB Approach							A (9.0)	A (9.2)		
	NB Left-Turn							A (7.4)	A (7.3)		
Service Road at Warehouse B Driveway	Overall Intersection		One-Way Stop Controlled					A (2.2)	A (2.5)		
	WB Left-Turn							A (7.3)	A (7.5)		
	NB Approach							A (8.9)	A (9.1)		
Service Road at Warehouse C Driveway	Overall Intersection		One-Way Stop Controlled					A (1.9)	A (2.1)		
	WB Left-Turn							A (7.4)	A (7.5)		
	NB Approach							A (9.0)	A (9.3)		
Davis Road at Warehouse D Driveway	Overall Intersection		One-Way Stop Controlled					A (0.9)	A (2.2)		
	EB Left-Turn							A (7.6)	A (7.7)		
	SB Approach							B (10.5)	B (10.9)		

###: Delay exceeds 300 seconds / vehicle

RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and are recommended to be completed as part of the proposed development. These improvements are listed below.

Old NC 86 at Waterstone Drive / Rippy Lane

No improvements are recommended at this intersection.

Old NC 86 at I-40 Westbound Ramps

No improvements are recommended at this intersection.

Old NC 86 at I-40 Eastbound Ramps

- Install a traffic signal.

The 2017 Settler's Pointe TIA concluded that this intersection met the criteria for installation of a traffic signal based upon their review of the 2016 collected traffic data against Traffic Signal Warrant 3B (Peak Hour Vehicular Volume)

Old NC 86 at Service Road

- Construct an exclusive eastbound right-turn lane with 100 feet of full-width storage and appropriate taper.
- Restripe the northbound approach to provide 50 feet of full-width storage and appropriate taper.

Old NC 86 at Davis Road

- Install a traffic signal. It is recommended that this signal not be installed until Driveway D is constructed and open to traffic.

Service Road at Warehouse A Driveway

- Construct Warehouse A Driveway as a single-lane approach operating under the control of a stop-sign.

Service Road at Warehouse B Driveway

- Construct Warehouse B Driveway as a single-lane approach operating under the control of a stop-sign.

Service Road at Warehouse C Driveway

- Construct Warehouse C Driveway as a single-lane approach operating under the control of a stop-sign.

Davis Road at Warehouse D Driveway

- Construct Warehouse D Driveway as a single-lane approach operating under the control of a stop-sign.

These recommendations are illustrated on Figure ES-2.

Figure ES-2: Recommended Improvements

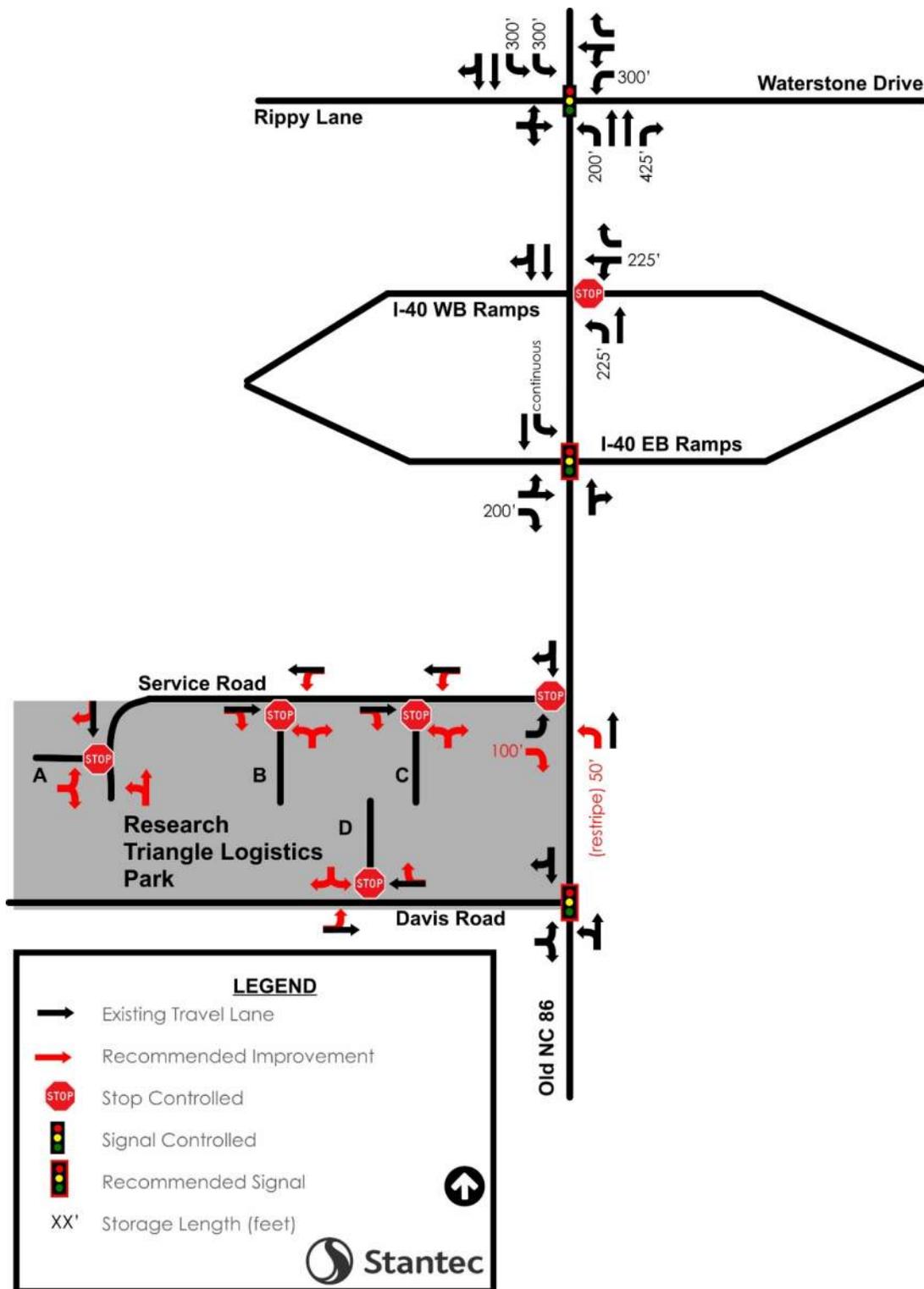


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RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Introduction
June 4, 2020

1.0 INTRODUCTION

The purpose of this report is to evaluate the traffic impacts of the proposed Research Triangle Logistics Park in Hillsborough, Orange County, North Carolina. This development is located to the west of Old NC 86 between Interstate 40 (I-40) and Davis Road. The development's location is shown in Figure 1. The site plan is shown in Figure 2.

The site currently consists of undeveloped forested land. Construction of the proposed development is anticipated to be completed in 2023. At full build-out the site is envisioned to provide 2,251,200 total square feet of industrial warehousing.

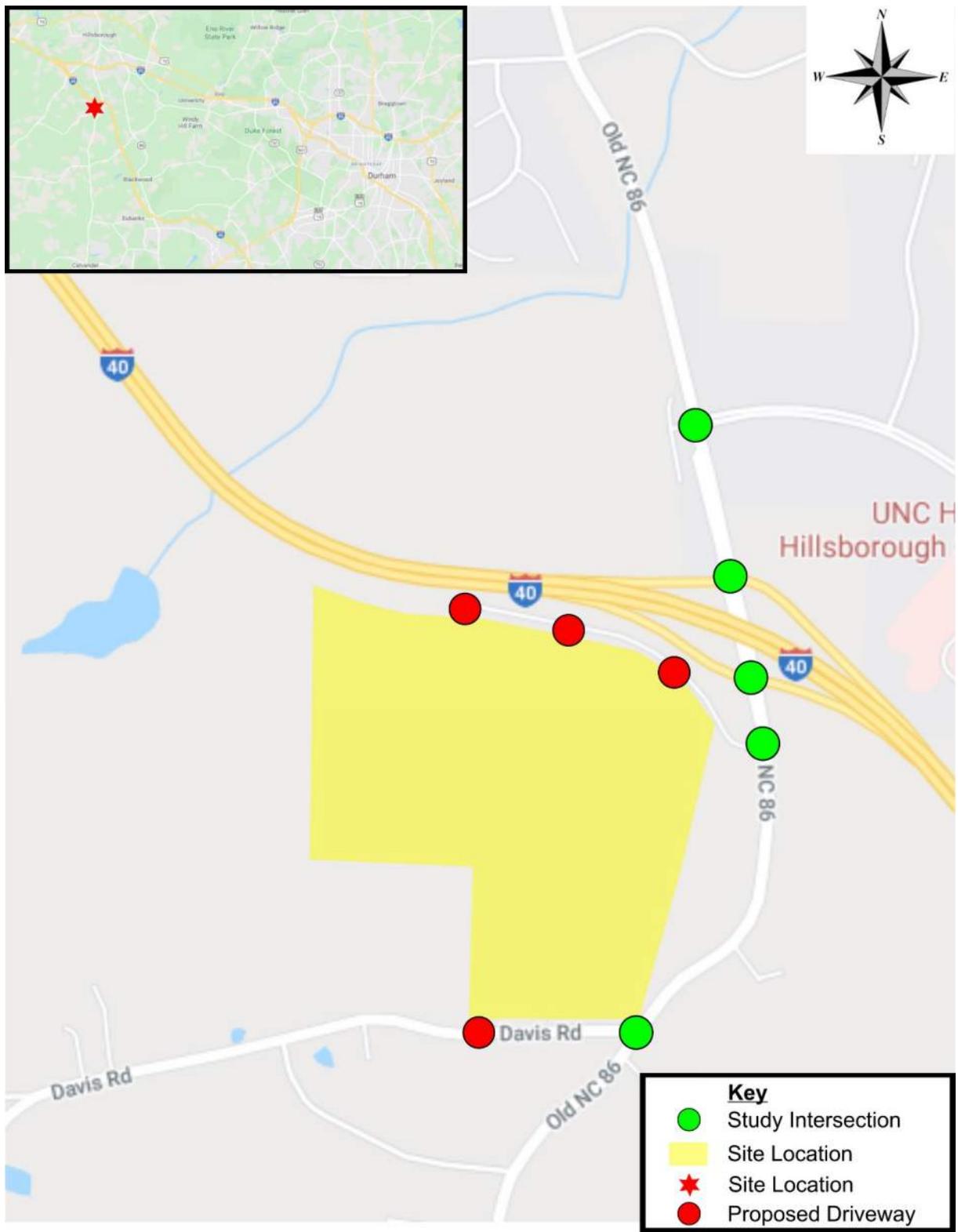
The purpose of this report is to evaluate the development in terms of projected vehicular traffic conditions, evaluate the ability of the adjacent roadways to accommodate the additional traffic and to recommend transportation improvements needed to mitigate congestion that may result from additional site traffic. This report presents trip generation, trip distribution, traffic analyses, and recommendations for improvements needed to meet anticipated traffic demands. The analysis examines the AM and PM peak hours for the 2020 Existing, 2023 No-Build, 2023 Build without improvements, and 2023 Build with improvements.

A study was conducted for the development referred to as Settler's Pointe in 2017. This development contained warehousing in addition to several land uses not pursued as part of the Research Triangle Logistics Park. This study is included in the Appendix.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Introduction
June 4, 2020

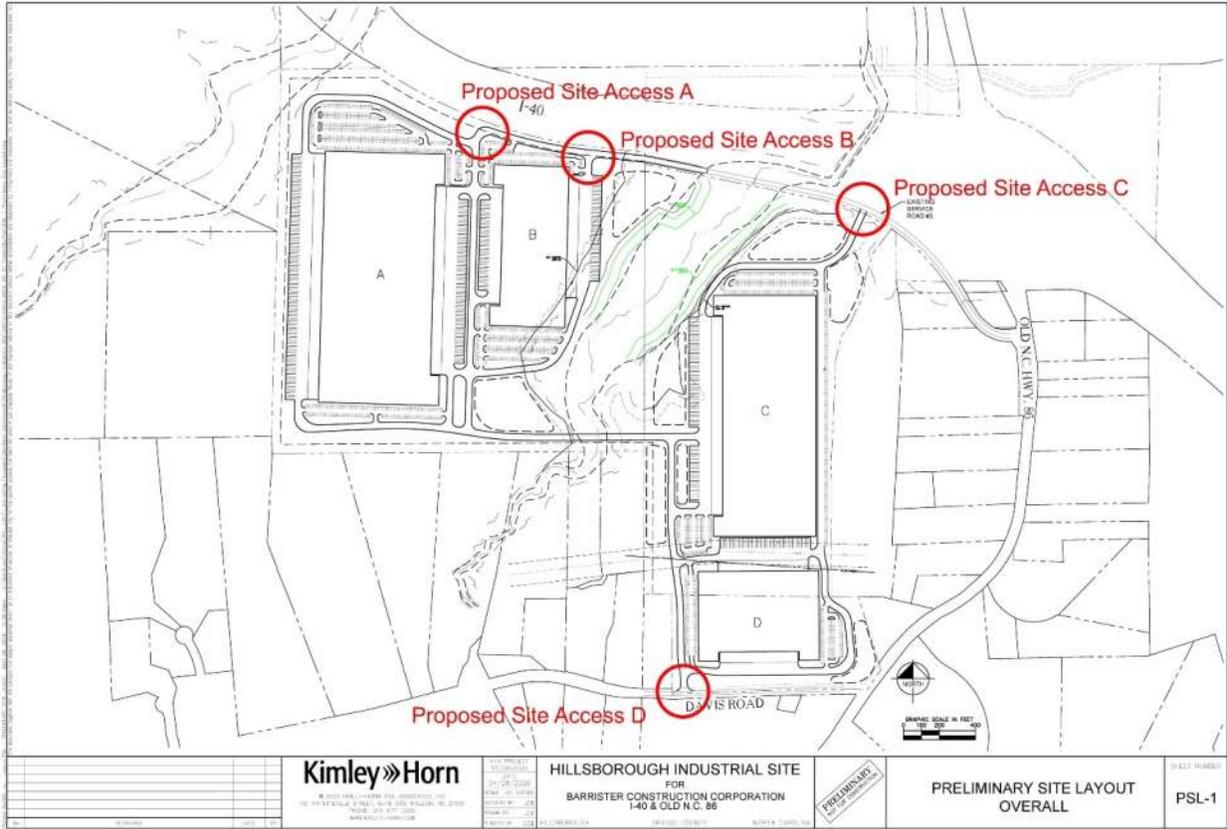
Figure 1: Site Location and Study Area Map



RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Introduction
June 4, 2020

Figure 2: Proposed Site Plan



RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions
June 4, 2020

2.0 INVENTORY OF TRAFFIC CONDITIONS

2.1 STUDY AREA

Stantec coordinated with the Town of Hillsborough, Orange County, and the North Carolina Department of Transportation (NCDOT) Division 7, District 1 to determine the appropriate study area and assumptions for this study. The final scoping document is included in the Appendix. The below intersections were agreed upon to be analyzed to determine the associated impacts from the proposed development. Planned Projects

Two projects are planned within the study area. Those are U-5845 (Churton Street Widening) and I-3306A (I-40 Widening). Both seek to make improvements to Old NC 86 at and north of the I-40 interchange, but no improvements are planned in the immediate vicinity of the site.

The traffic forecast for I-3306A was revised in July 2019 and states that Assumptions and changes in the distribution of population and employment in the forecast study area are implicit in the Triangle Regional Model (TRMv6) that was updated in May of 2019. The rezoning for Settler's Pointe occurred on January 23, 2018. Therefore, the zoning of this project was included and therefore the development was accounted for in the traffic forecast.

Figure 3 shows a diagram of the existing lane configurations, geometry, and traffic control features in the study area.

- Old NC 86 at Waterstone Drive / Rippy Lane existing four-legged signalized intersection
- Old NC 86 at I-40 WB Ramps existing two-way stop-controlled intersection
- Old NC 86 at I-40 EB Ramps existing two-way stop-controlled intersection
- Old NC 86 at Service Road existing two-way stop-controlled intersection
- Old NC 86 at Davis Road existing two-way stop-controlled intersection

The proposed development is envisioned to construct the following driveways:

- Service Road at Warehouse A Driveway proposed two-way stop-controlled driveway
- Service Road at Warehouse B Driveway proposed two-way stop-controlled driveway
- Service Road at Warehouse C Driveway proposed two-way stop-controlled driveway
- Davis Road at Warehouse D Driveway proposed two-way stop-controlled driveway

2.2 EXISTING ROADWAY CONDITIONS

Table 1 provides a detailed description of the existing study area roadway network. All functional classification and average annual daily traffic (AADT) information, where available, was obtained from NCDOT via the NCDOT.gov website.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions
June 4, 2020

Table 1: Existing Conditions

Road Name	Road Number	Primary Cross-Section	Functional Classification ¹	2018 AADT ² (vpd)	Speed Limit (mph)	Maintenance Agency
Waterstone Drive	N/A	4-Lane Divided	Local Road	None Provided	35	Hillsborough
Rippy Lane	SR 1224	2-Lane Undivided	Local Road	None Provided	Un-posted	NCDOT
I-40 Ramps	I-40	4-Lane Divided	Other Principal Arterial	74,000	65	NCDOT
Old NC 86	SR 1009	2-Lane Undivided	Minor Arterial	6,550	45	NCDOT
Service Road	N/A	2-Lane Undivided	Local Road	None Provided	25	NCDOT
Davis Road	SR 1129	2-Lane Undivided	Local Road	2,300	45	NCDOT

2.3 PLANNED PROJECTS

Two projects are planned within the study area. Those are U-5845 (Churton Street Widening) and I-3306A (I-40 Widening). Both seek to make improvements to Old NC 86 at and north of the I-40 interchange, but no improvements are planned in the immediate vicinity of the site.

The traffic forecast for I-3306A was revised in July 2019 and states that Assumptions and changes in the distribution of population and employment in the forecast study area are implicit in the Triangle Regional Model (TRMv6) that was updated in May of 2019. The rezoning for Settler's Pointe occurred on January 23, 2018. Therefore, the zoning of this project was included and therefore the development was accounted for in the traffic forecast.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Inventory of Traffic Conditions
June 4, 2020

Figure 3: 2020 Existing Lane Configurations and Traffic Control

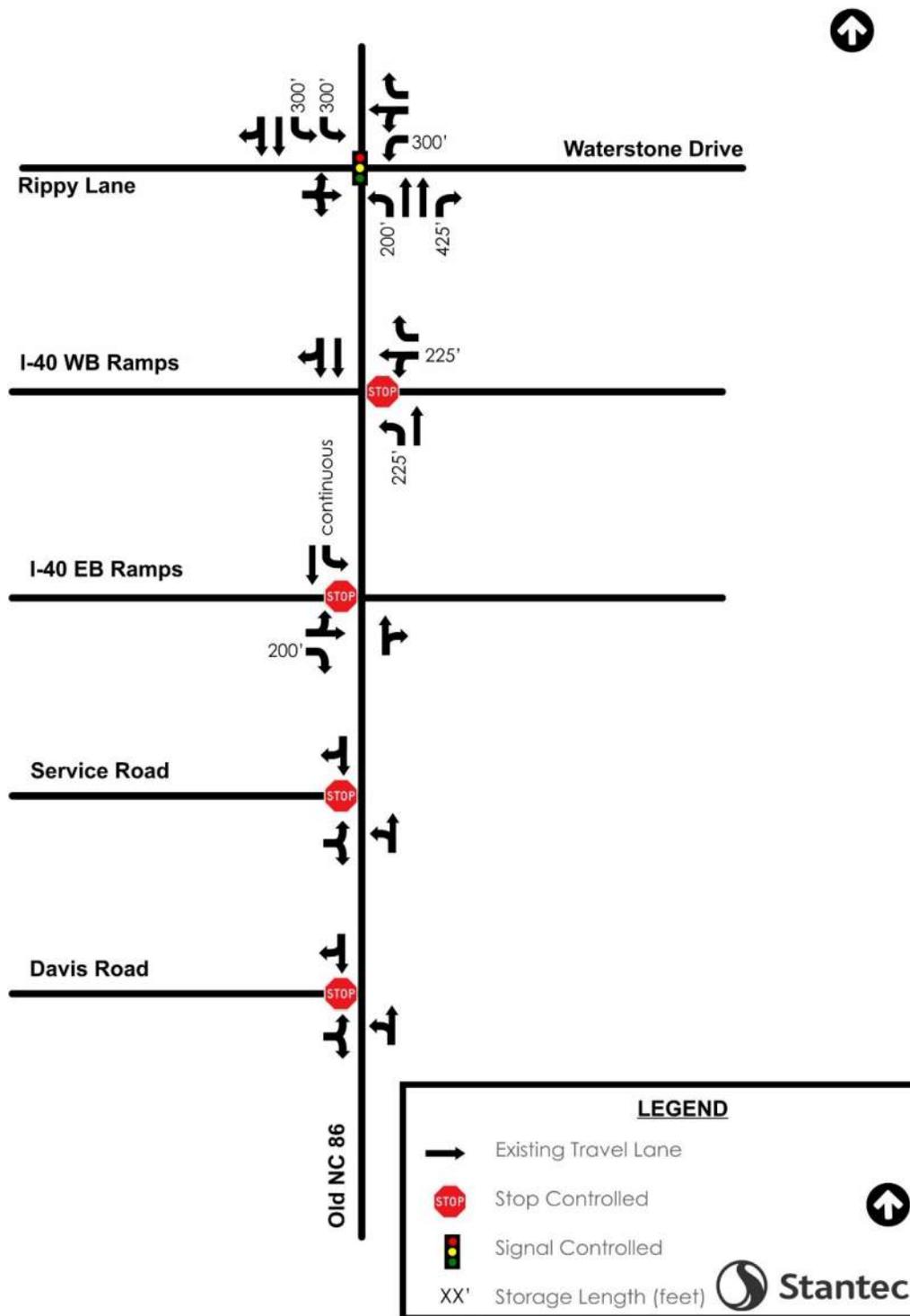


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RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

3.0 TRIP GENERATION

Trips were estimated using the 10th Edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual³. The site is expected to consist of 2,251,200 square feet of industrial warehouse building. Table 2 shows the number of anticipated trips that will be generated by the site of the proposed development (Daily, AM Peak, and PM Peak entering and exiting).

Table 2: Site ITE Trip Generation

Land Use	Size (SF)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			Total	Enter	Exit	Total	Enter	Exit
Warehouse (LUC 150)	2,251,200	3,648	320	247	73	326	88	238

The NCDOT Rate vs. Equation Spreadsheet (effective July 1, 2018) limits the use of Warehousing (land use code 150) to 2,000,000 square feet. As the proposed development is in-excess of this limit, the approach to trip generation was to generate trips separately for 1,000,000 and 1,251,200 square feet. This methodology was approved by NCDOT on the scoping forms contained in the Appendix.

4.0 TRAFFIC DISTRIBUTION

4.1 SITE TRIP DISTRIBUTION

In order to accurately determine the effect of the proposed development on the surrounding roadway network, an estimate of the expected distribution of traffic entering and exiting the site is needed. The below percentages were taken from the 2017 Settler's Pointe TIA and are used in this study for the AM and PM peak hours. Site trip distribution and site trip assignment is shown on Figure 9 and Figure 10; respectively.

- 30% to / from the east on I-40;
- 25% to / from the west on I-40;
- 20% to / from the north on Old NC 86;
- 15% to / from the south on Old NC 86;
- 5% to / from the east on Waterstone Drive; and
- 5% to / from the west on Davis Road.

5.0 TRAFFIC VOLUMES

Turning movement counts were taken from the Settler's Pointe TIA. The data was collected on Tuesday, October 18, 2016 by GreenLight Traffic Services, Inc. The Settler's Pointe TIA then balanced the counts by adjusting the through movements on Old NC 86 upward to create a balanced, conservative network. These counts and figure from the prior study are contained in the Appendix.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes

June 4, 2020

- Old NC 86 at Waterstone Drive / Rippy Lane
- Old NC 86 at I-40 WB Ramps
- Old NC 86 at I-40 EB Ramps
- Old NC 86 at Service Road
- Old NC 86 at Davis Road

5.1 FUTURE TRAFFIC GROWTH

Future traffic growth is the increase in traffic volumes due to usage increases and non-specific growth throughout the area. The balanced 2016 existing volumes from the Settler's Pointe TIA were grown by a 1% annual rate to estimate the 2020 volumes. This growth is shown in Figure 5.

The 2020 traffic volumes were subsequently grown by a 1% annual rate to account for background growth to 2023. This growth is shown in Figure 6. All traffic volume calculations are contained in the Appendix.

5.2 APPROVED DEVELOPMENT TRAFFIC

As this study uses the traffic counts from the Settler's Pointe TIA, the approved development information presented in the prior study was determined suitable for use in this analysis. Specifically, the Waterstone Development was partially constructed at the time the traffic counts were obtained. This development consists of single family homes, townhomes, apartments, a soccer complex, and hospital space. Trips associated with Waterstone are shown in Figure 7 and a discussion from the Settler's Pointe TIA is provided in the scoping forms in the Appendix.

5.3 NO-BUILD TRAFFIC VOLUMES

The historical growth and approved development traffic volumes were added to the 2020 existing volumes to determine the No-Build traffic volumes. The 2023 No-Build traffic volumes are shown in Figure 8. All traffic volume calculations are contained in the Appendix.

5.4 TOTAL BUILD TRAFFIC WITH PROPOSED DEVELOPMENT

To obtain the total 2023 Build traffic volumes, the distributed site traffic was added to the respective no-build traffic volumes. The total AM and PM peak hour turning movement volumes for the study intersections were then calculated and analyzed for the 2023 traffic scenarios. The 2023 Build-out traffic volumes are shown in Figure 11. All traffic volume calculations are contained in the Appendix.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 4: Existing (2020) Traffic Volumes

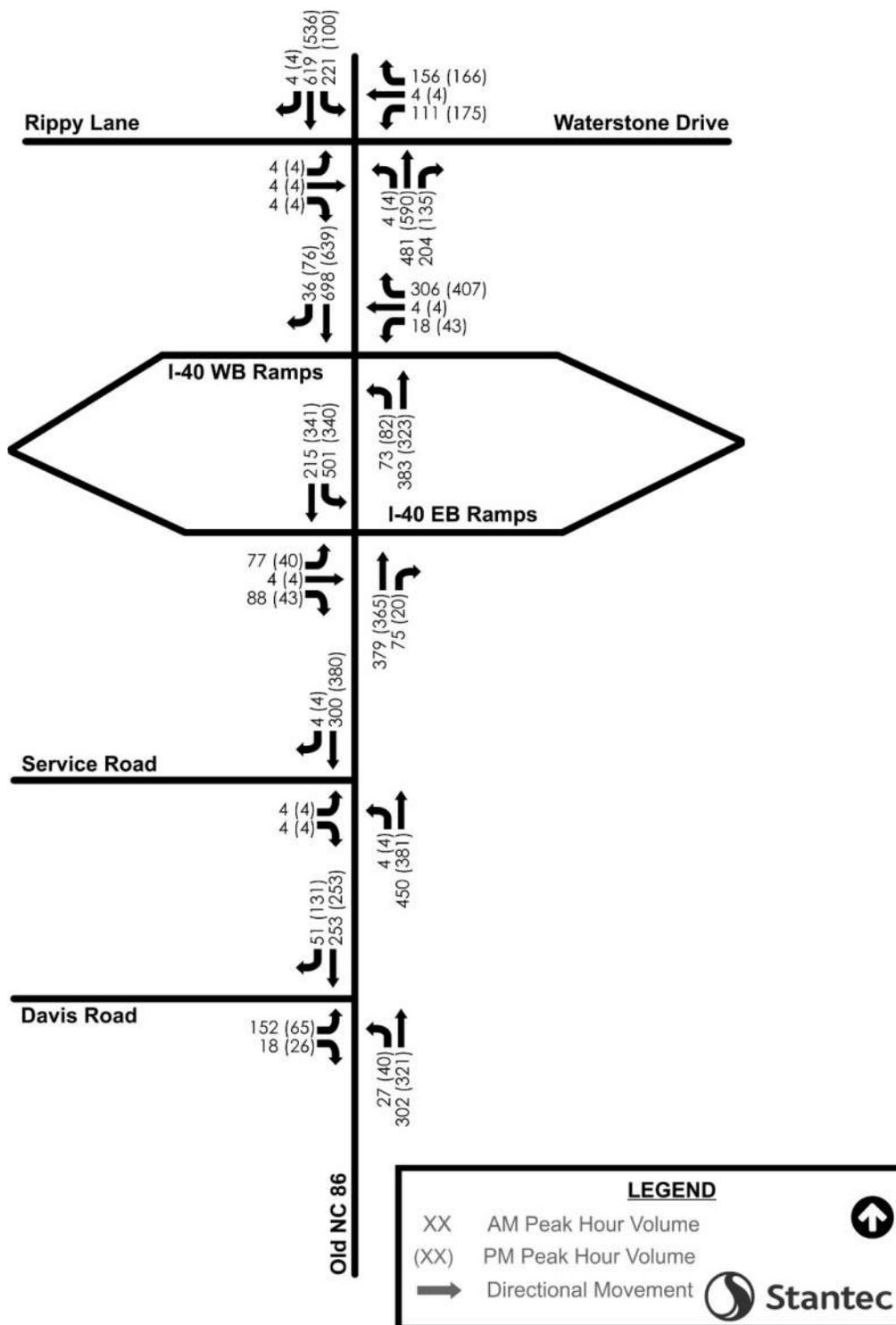


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RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 5: Historic Growth Traffic Volumes (2016-2020)

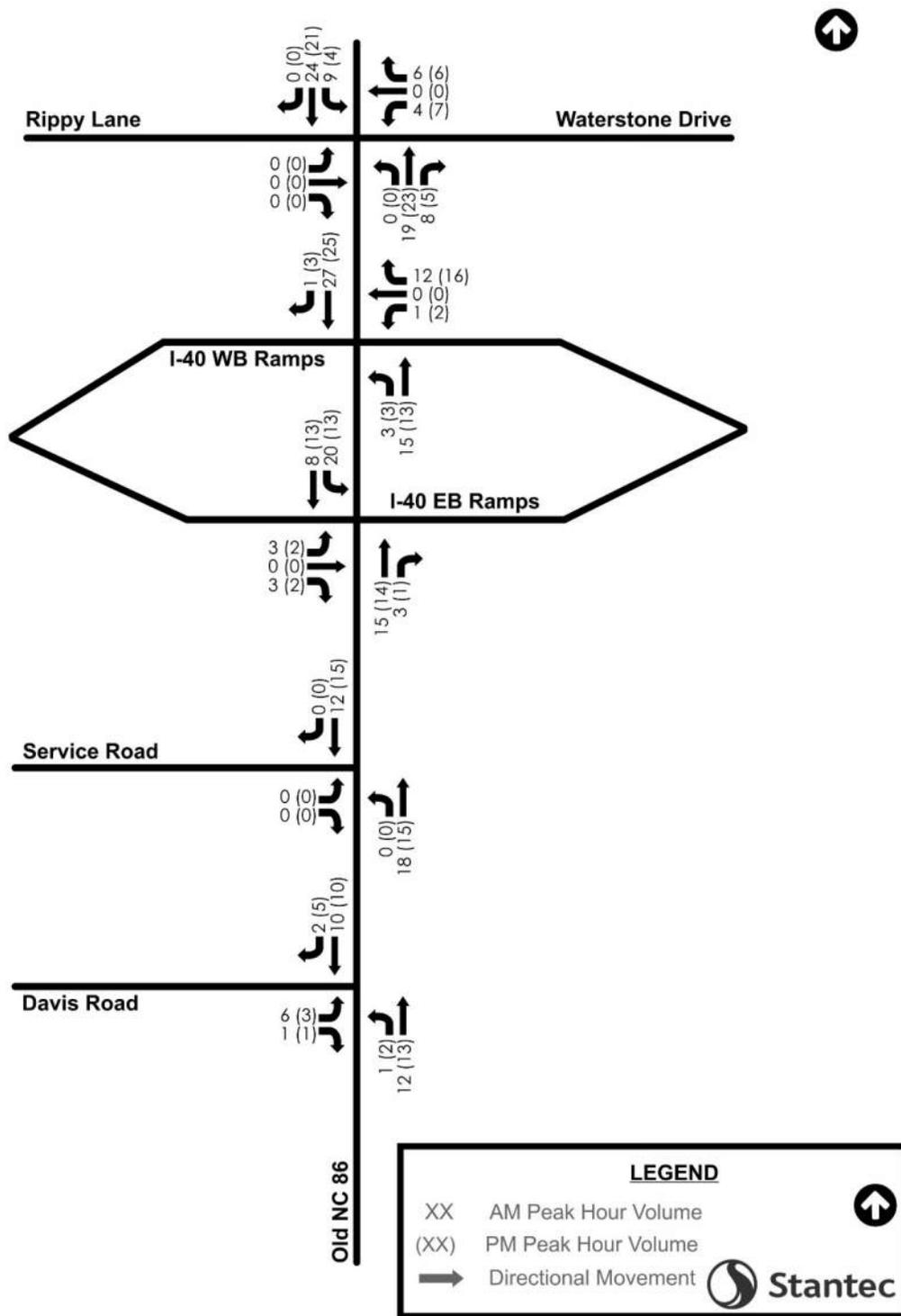


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RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 6: Historic Growth Traffic Volumes (2020-2023)

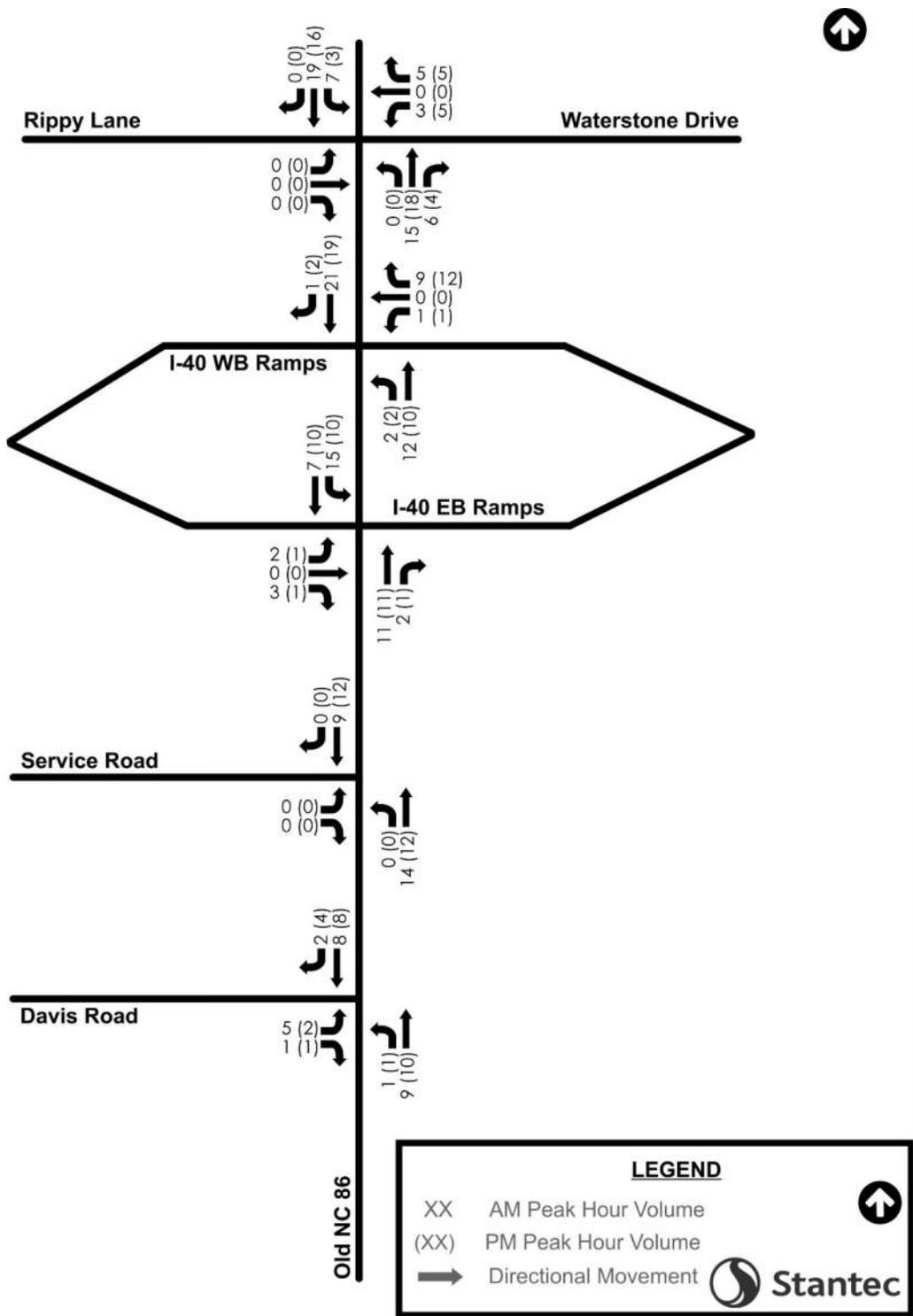
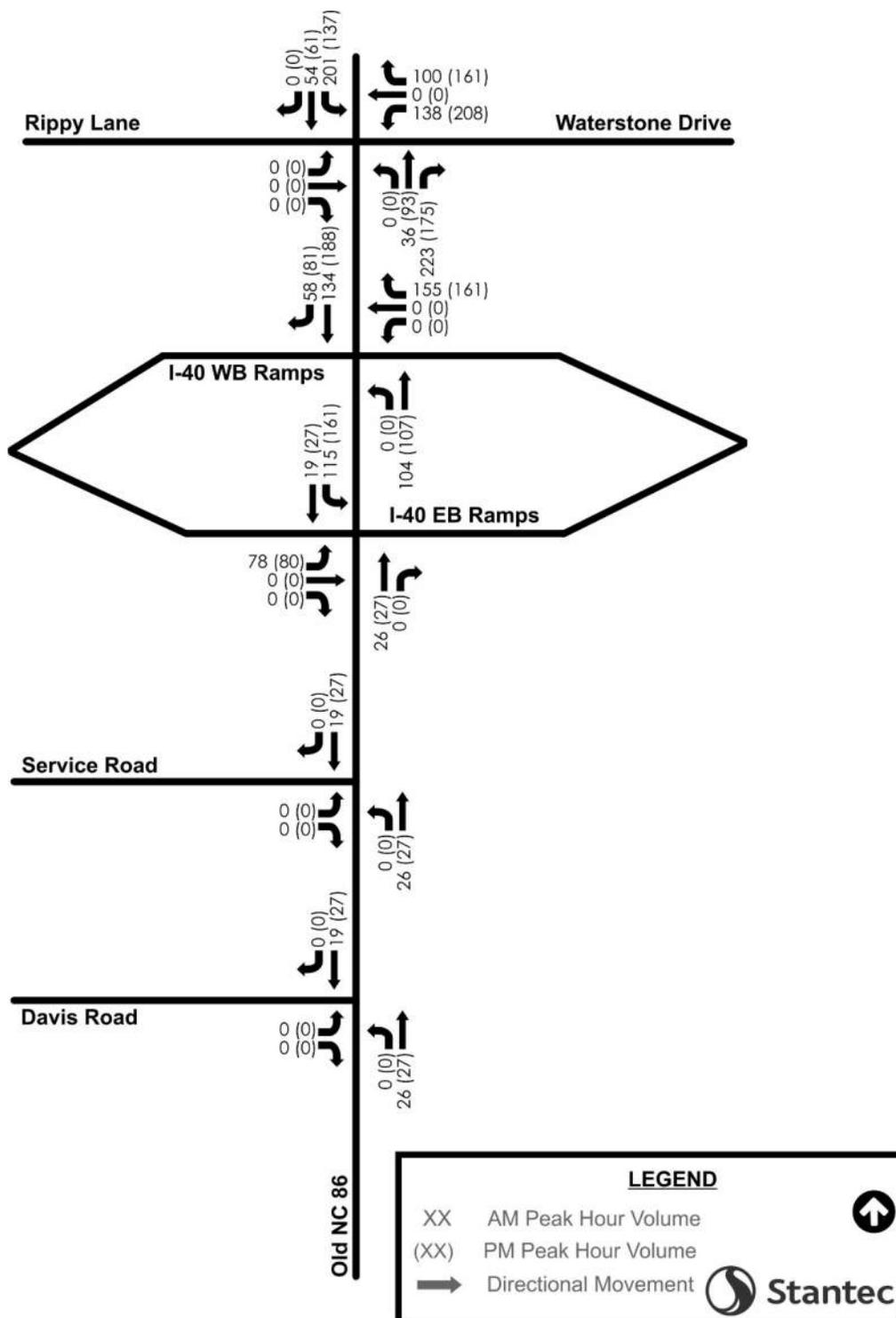


Figure is Not To Scale

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 7: Approved Development Traffic Volumes



RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 8: 2023 No-Build Traffic Volumes

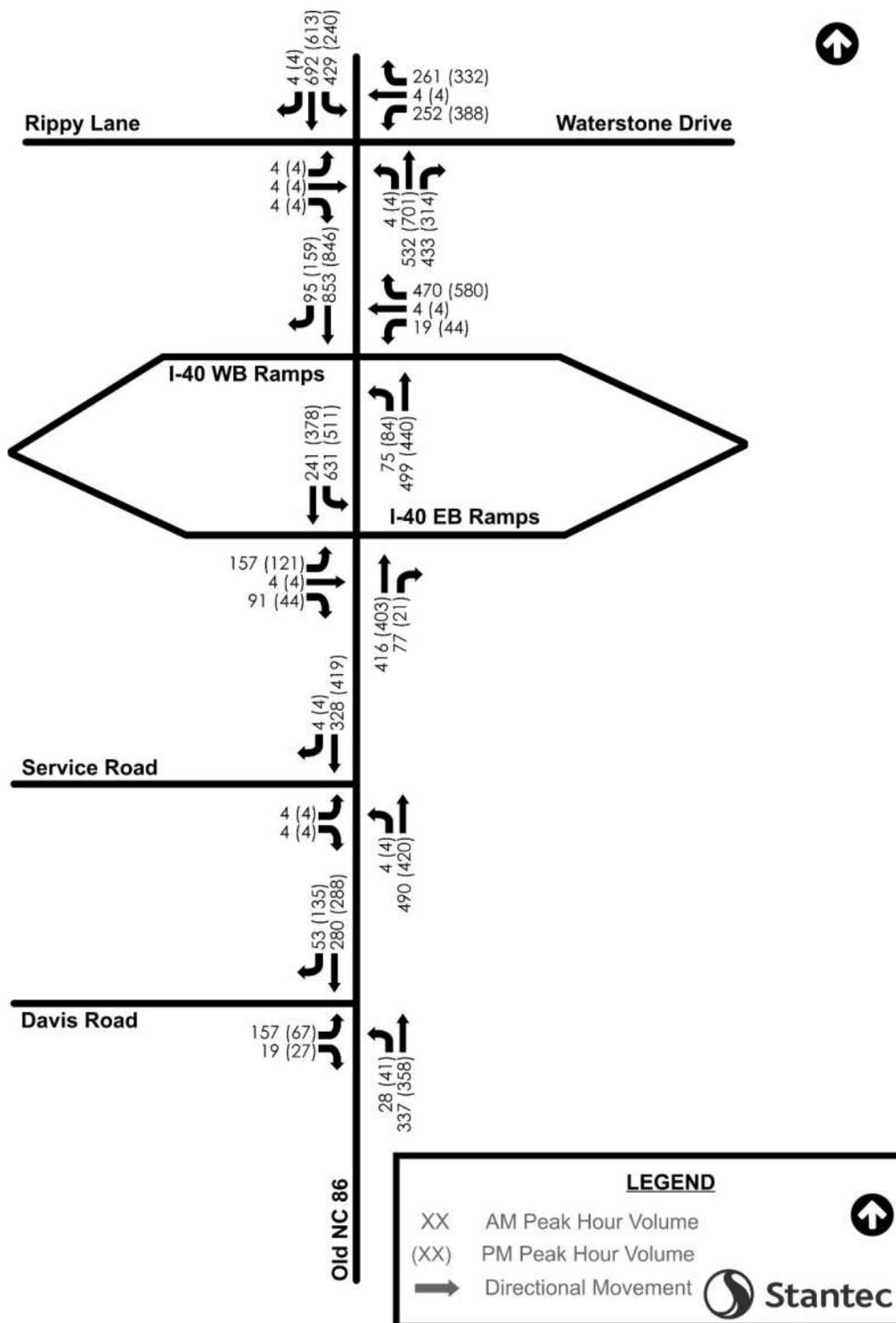
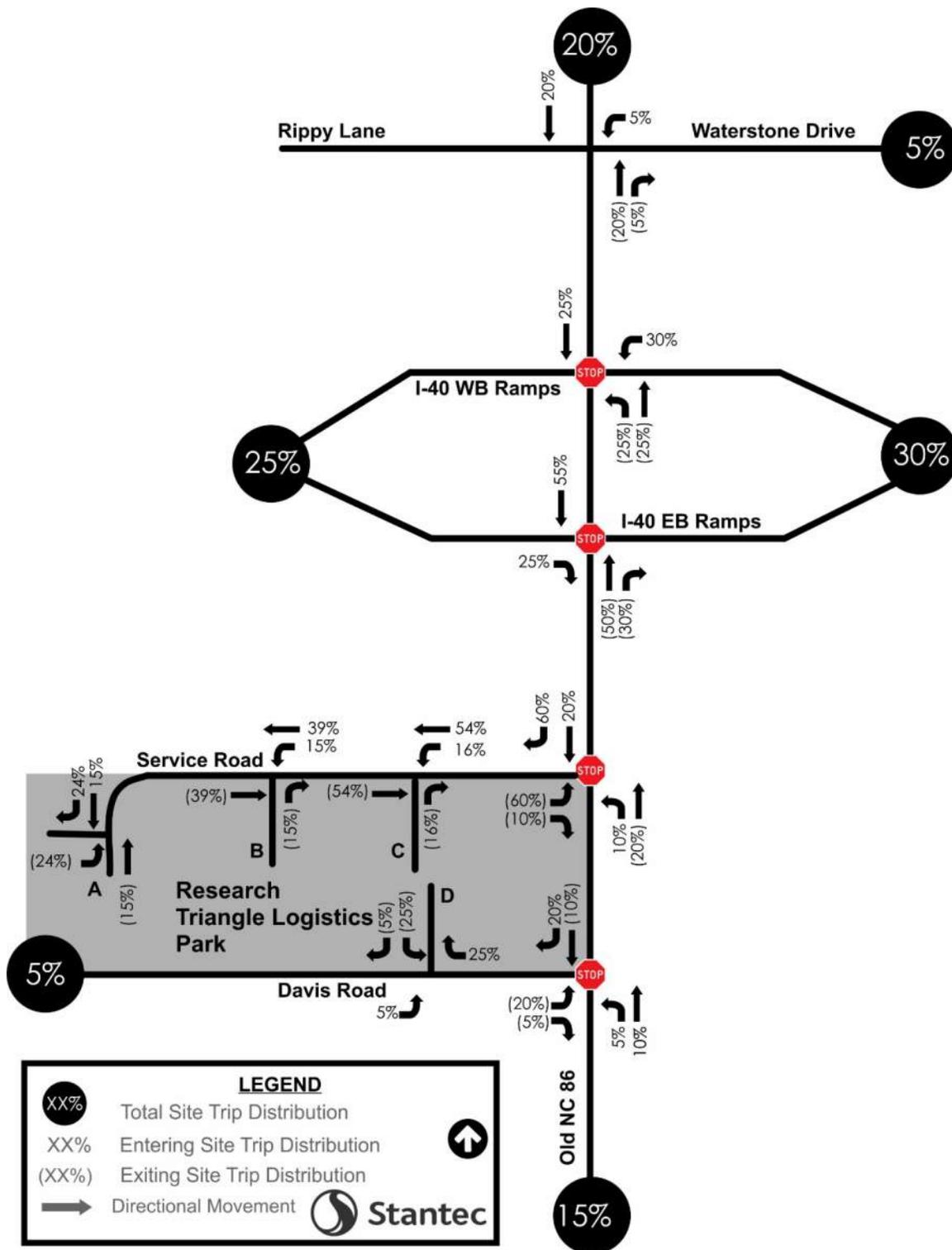


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RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

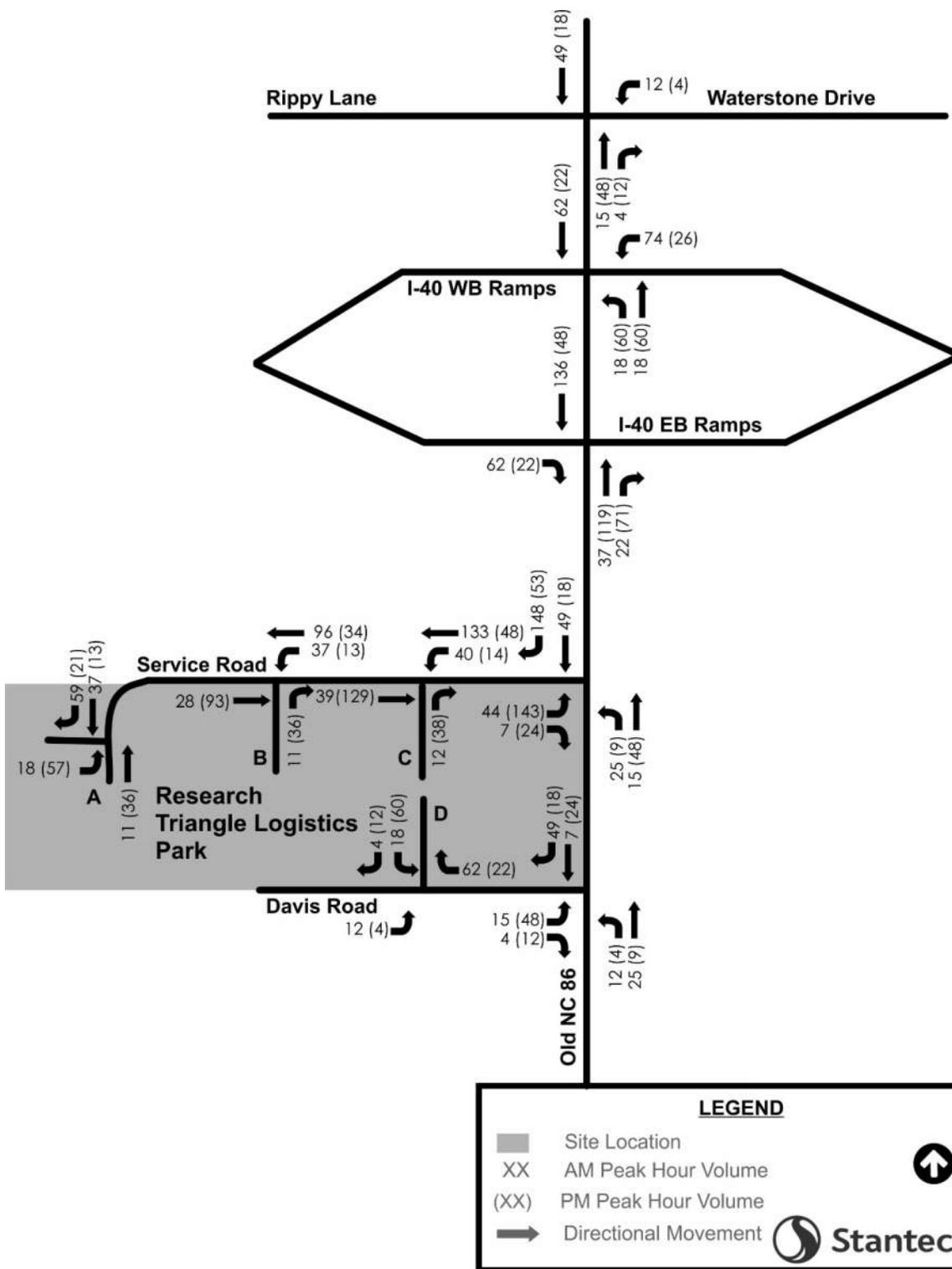
Figure 9: Site Trip Distribution



RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

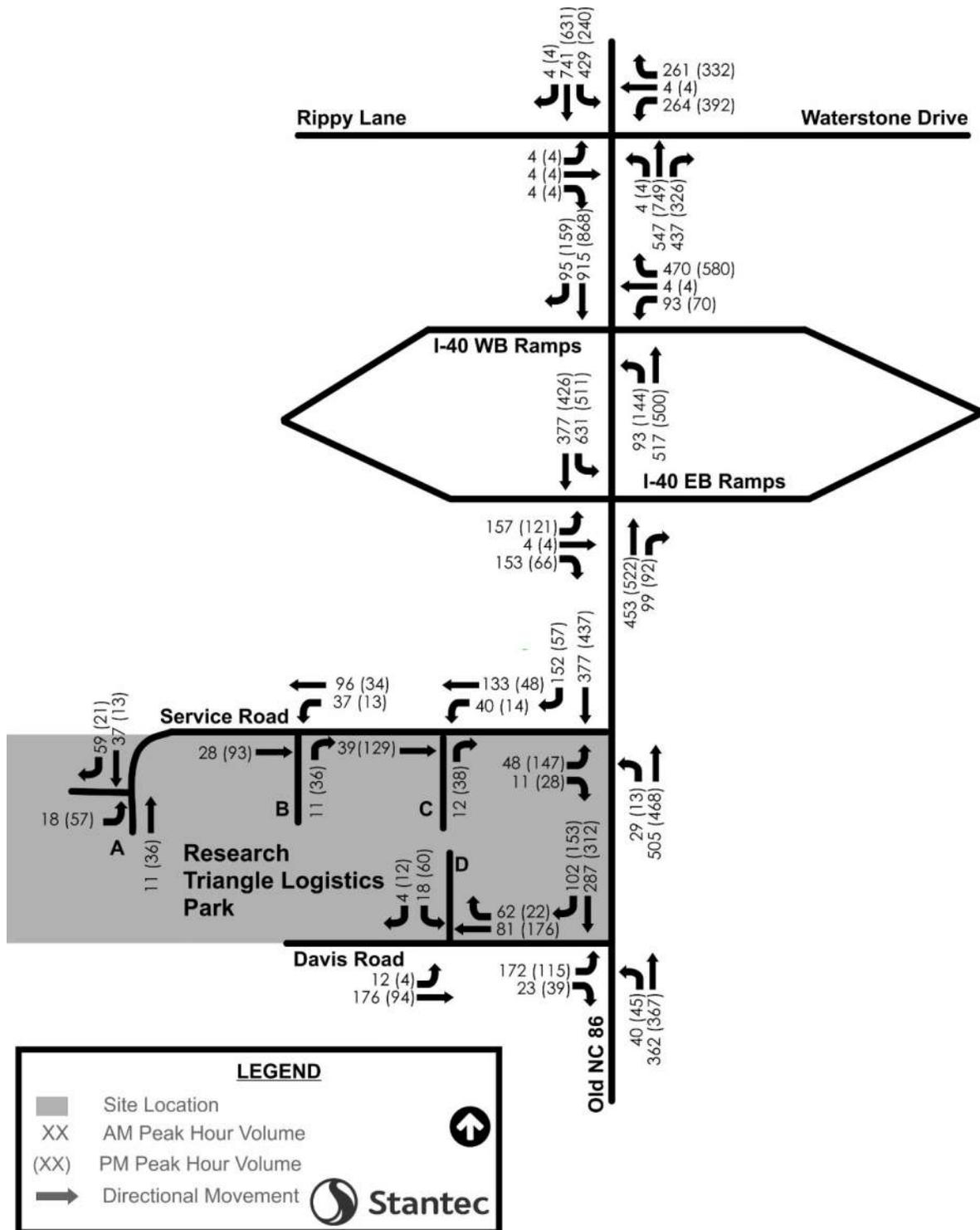
Figure 10: Site Trip Assignment



RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Traffic Volumes
June 4, 2020

Figure 11: 2023 Build Traffic Volumes



6.0 TRAFFIC ANALYSIS

Capacity analyses were performed for the roadway network in the project study area. The traffic analysis program Synchro Version 10 was used to analyze all signalized and stop-controlled intersections according to methods put forth by the Transportation Research Board’s Highway Capacity Manual (HCM)⁴. The Highway Capacity Manual defines capacity as “the maximum rate of flow at which persons or vehicles can be reasonably expected to traverse a point or uniform section of a lane or roadway during a specified time period under prevailing roadway, traffic, and control conditions, usually expressed as vehicles per lane per hour.”

Level of service (LOS) is a term used to describe different traffic conditions and is defined as a “qualitative measure describing operational conditions within a traffic stream, and their perception by motorists/ or passengers.” LOS varies from Level A, representing free flow, to Level F where traffic breakdown conditions are evident. At an unsignalized intersection, the primary traffic on the main roadway is virtually uninterrupted. Therefore, the overall delay for the intersection is usually less than what is calculated for the minor street movements. The overall intersection delay and the delay for the intersection’s minor movement(s) are reported in the summary tables of this report. Generally, LOS D is acceptable for signalized intersections in suburban areas during peak periods. With the current method of reporting LOS for unsignalized intersections, it is not uncommon for some of the minor street movements to be operating at a LOS F during peak hour conditions and that is not necessarily indicative of an area that requires improvements.

Capacity analyses were completed in accordance with *NCDOT Congestion Management Capacity Analysis Guidelines*⁵. It should be noted that the analyses includes permitted + protected signal phasing in-addition to right-turn-on-red at the intersection of Old NC 86 at Waterstone Drive / Rippy Lane. This provided results more indicative of field conditions as the signal currently operates with a flashing yellow arrow. Table 3 presents the criteria of each LOS as indicated in the *HCM*⁵.

Table 3: Level of Service Criteria

Level of Service (LOS)	Signalized Intersection Control Delay (seconds / vehicle)	Unsignalized Intersection Control Delay (seconds / vehicle)
A	≤ 10	≤ 10
B	>10 and ≤ 20	>10 and ≤ 15
C	>20 and ≤ 35	>15 and ≤ 25
D	>35 and ≤ 55	>25 and ≤ 35
E	>55 and ≤ 80	>35 and ≤ 50
F	>80	>50

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis

June 4, 2020

Capacity analyses were performed for the following conditions.

- 2020 Existing
- 2023 No-Build
- 2023 Build
- 2023 Build-Improved

The following existing intersections were included in the capacity analysis for the above scenarios; where applicable:

- Old NC 86 at Waterstone Drive / Rippy Lane
- Old NC 86 at I-40 WB Ramps;
- Old NC 86 at -40 EB Ramps;
- Old NC 86 at Service Road; and
- Old NC 86 at Davis Road.

The below proposed driveways were analyzed in the Build and Build with Improvements scenarios.

- Service Road at Warehouse A Driveway
- Service Road at Warehouse B Driveway
- Service Road at Warehouse C Driveway
- Davis Road at Warehouse D Driveway

All Synchro files and detailed printouts can be found in the Appendix. A brief summary of the results of the analyses is provided in the following sub-sections.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis
June 4, 2020

6.1 2020 EXISTING CAPACITY ANALYSIS

The 2020 Existing scenario results show that all intersections currently operate at LOS D or better in both peak periods with one exception. That is, the eastbound approach of the Old NC 86 at I-40 eastbound ramp operates at LOS E in the PM peak hour. The level of service and delay for the existing traffic conditions is listed below in Table 4.

Table 4: Level of Service and Delay for 2020 Existing Conditions

Intersection	Approach	Existing Intersection Control	2020 Existing	
			AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)
Old NC 86 at Waterstone Drive / Rippy Lane	Overall Intersection	Signalized	B (16.4)	B (16.4)
	EB Approach		D (43.4)	D (43.4)
	WB Approach		C (26.1)	C (31.7)
	NB Approach		B (10.4)	B (11.3)
	SB Approach		B (17.9)	B (13.5)
Old NC 86 at I-40 WB Ramps	Overall Intersection	One-Way Stop Controlled	A (1.0)	A (1.6)
	WB Approach		C (21.9)	C (22.0)
	NB Left-Turn		A (9.9)	A (9.9)
	SB Approach		A (0.0)	A (0.0)
Old NC 86 at I-40 EB Ramps	Overall Intersection	One-Way Stop Controlled	F (51.2)	A (7.0)
	EB Approach		F (###)	F (54.6)
	NB Approach		A (0.0)	A (0.0)
	SB Left-Turn		B (12.1)	A (9.8)
Old NC 86 at Service Road	Overall Intersection	One-Way Stop Controlled	A (0.2)	A (0.2)
	EB Approach		B (13.1)	B (13.5)
	NB Left-Turn		A (8.0)	A (8.2)
Old NC 86 at Davis Road	Overall Intersection	One-Way Stop Controlled	A (4.8)	A (2.3)
	EB Approach		C (21.1)	C (17.2)
	NB Left-Turn		A (8.0)	A (8.3)
	SB Approach		A (0.0)	A (0.0)

###: Delay exceeds 300 seconds / vehicle

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis
June 4, 2020

6.2 2023 NO-BUILD CAPACITY ANALYSIS

The 2023 No-Build scenario results show that all intersections and approaches will operate at LOS D or better in both peak periods with one exception. That is, the eastbound approach to the intersection of Old NC 86 at I-40 eastbound ramps operates at LOS F in both AM and PM peak hours. The no-build level of service and delay is listed below in Table 5.

Table 5: Level of Service and Delay for 2023 No-Build Conditions

Intersection	Approach	Existing Intersection Control	2023 No-Build	
			AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)
Old NC 86 at Waterstone Drive / Rippy Lane	Overall Intersection	Signalized	C (21.2)	C (22.6)
	EB Approach		D (43.5)	D (43.6)
	WB Approach		C (28.5)	C (32.2)
	NB Approach		B (14.3)	B (16.5)
	SB Approach		C (23.7)	C (21.4)
Old NC 86 at I-40 WB Ramps	Overall Intersection	One-Way Stop Controlled	A (1.0)	A (1.7)
	WB Approach		D (30.2)	D (34.3)
	NB Left-Turn		B (11.3)	B (11.8)
	SB Approach		A (0.0)	A (0.0)
Old NC 86 at I-40 EB Ramps	Overall Intersection	One-Way Stop Controlled	F (###)	F (158.3)
	EB Approach		F (###)	F (###)
	NB Approach		A (0.0)	A (0.0)
	SB Left-Turn		C (15.9)	B (3.1)
Old NC 86 at Service Road	Overall Intersection	One-Way Stop Controlled	A (0.2)	A (0.2)
	EB Approach		B (13.8)	B (14.4)
	NB Left-Turn		A (8.0)	A (8.3)
Old NC 86 at Davis Road	Overall Intersection	One-Way Stop Controlled	A (5.2)	A (2.4)
	EB Approach		C (24.8)	C (19.4)
	NB Left-Turn		A (8.1)	A (8.4)
	SB Approach		A (0.0)	A (0.0)

###: Delay exceeds 300 seconds / vehicle

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis

June 4, 2020

6.3 2023 BUILD CAPACITY ANALYSIS

As a result of the 2023 Build analysis, all intersections are expected to operate at LOS C or better in both peak periods, with a few exceptions. Those are as follows:

- The westbound approach to the intersection of Old NC 86 at I-40 westbound ramps in both peak hours;
- The eastbound approach to the intersection of Old NC 86 at I-40 eastbound ramps in both peak hours; and
- The eastbound approach to the intersection of Old NC 86 at the Service Road in the PM peak hour.

The build level of service and delay is listed in Table 6.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis
June 4, 2020

Table 6: Level of Service and Delay for 2023 Build Conditions

Intersection	Approach	Intersection Control	2023 Build	
			AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)
Old NC 86 at Waterstone Drive / Rippy Lane	Overall Intersection	Signalized	C (21.3)	C (22.7)
	EB Approach		D (43.5)	D (43.6)
	WB Approach		C (29.6)	C (32.3)
	NB Approach		B (14.4)	B (17.1)
	SB Approach		C (23.1)	C (21.2)
Old NC 86 at I-40 WB Ramps	Overall Intersection	One-Way Stop Controlled	A (5.5)	A (5.2)
	WB Approach		F (86.6)	F (96.5)
	NB Left-Turn		B (12.0)	B (13.0)
	SB Approach		A (0.0)	A (0.0)
Old NC 86 at I-40 EB Ramps	Overall Intersection	One-Way Stop Controlled	F (###)	F (268.2)
	EB Approach		F (###)	F (###)
	NB Approach		A (0.0)	A (0.0)
	SB Left-Turn		C (17.9)	C (15.3)
Old NC 86 at Service Road	Overall Intersection	One-Way Stop Controlled	A (1.6)	A (7.5)
	EB Approach		D (25.2)	E (48.5)
	NB Left-Turn		A (8.8)	A (8.6)
Old NC 86 at Davis Road	Overall Intersection	One-Way Stop Controlled	A (7.2)	A (4.6)
	EB Approach		D (34.7)	D (28.5)
	NB Left-Turn		A (8.3)	A (8.6)
	SB Approach		A (0.0)	A (0.0)
Service Road at Warehouse A Driveway	Overall Intersection	One-Way Stop Controlled	A (1.7)	A (4.4)
	EB Approach		A (9.0)	A (9.2)
	NB Left-Turn		A (7.4)	A (7.3)
Service Road at Warehouse B Driveway	Overall Intersection	One-Way Stop Controlled	A (2.2)	A (2.5)
	WB Left-Turn		A (7.3)	A (7.5)
	NB Approach		A (8.9)	A (9.1)
Service Road at Warehouse C Driveway	Overall Intersection	One-Way Stop Controlled	A (1.9)	A (2.1)
	WB Left-Turn		A (7.4)	A (7.5)
	NB Approach		A (9.0)	A (9.3)
Davis Road at Warehouse D Driveway	Overall Intersection	One-Way Stop Controlled	A (0.9)	A (2.2)
	EB Left-Turn		A (7.6)	A (7.7)
	SB Approach		B (10.5)	B (10.9)

###: Delay exceeds 300 seconds / vehicle

6.4 2023 BUILD-IMPROVED CAPACITY ANALYSIS

The following sections analyzes traffic with the recommended improvements in place. These improvements are detailed in section 8.0. The results of the analysis show that operations are improved at the following intersections within the study area:

- Old NC 86 at I-40 Eastbound Ramps;
- Old NC 86 at Service Road; and
- Old NC 86 at Davis Road.

Heavy left-turning traffic is noted on the southbound approach to the intersection of Old NC 86 at the I-40 Eastbound Ramp. The proposed development does not add vehicles to this turn. The analysis of this proposed signal is performed conservatively using protected-only left-turn treatments per North Carolina Department of Transportation Congestion Management *Capacity Analysis Guidelines*. It is likely that this left-turn will be designed and operated with a flashing yellow arrow; which would improve operations.

Queues were observed to extend along Old NC 86 from the I-40 Eastbound ramps beyond the Service Road. This impediment creates longer queues on the Service Road. As discussed previously, operating the southbound left-turn at the intersection of Old NC 86 at I-40 Eastbound Ramp with a yellow flashing arrow would allow more efficient left-turn operation in addition to increasing the green time given to the northbound through movement. This reallocation of green time would lessen the time during which queues block left-turning traffic from the Service Road onto Old NC 86. Furthermore, if long delays occur during peak periods, it is possible for traffic exiting the development to utilize access onto Davis Road.

It should be noted that the southbound right-turn from Old NC 86 onto the Service Road meets the requirements for an exclusive right-turn lane according to the chart contained in the North Carolina Department of Transportation Policy on Street and Driveway Access to North Carolina Highways. A right-turn lane is not recommended as the right-of-way does not appear to be available to construct this lane. Delay is anticipated to be minimal on this approach as the southbound right-turn is free-flowing.

No improvements are recommended at the intersection of Old NC 86 at I-40 Westbound ramps. The westbound left-turn operates at LOS F with the addition of the proposed development traffic. However, SimTraffic maximum observed queues are less than the current 225 feet of provided storage in both the AM and PM peak hours. It is not uncharacteristic of stop-controlled approaches to unsignalized intersections to operate at failing levels of service during the peak hours and it should be noted that the westbound right-turn flows freely. It should be noted that all other movements operate at LOS B or better at this intersection.

Table 7 lists the results of the capacity analysis with the recommended improvements in place.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Capacity Analysis
June 4, 2020

Table 7: Level of Service and Delay for 2023 Build-Improved Conditions

Intersection	Approach	Proposed Intersection Control	2023 Build-Improved			
			AM Peak LOS (Delay in sec./veh.)	PM Peak LOS (Delay in sec./veh.)		
Old NC 86 at Waterstone Drive / Rippy Lane	Overall Intersection	Signalized				
	EB Approach					
	WB Approach					
	NB Approach					
Old NC 86 at I-40 WB Ramps	Overall Intersection	One-Way Stop Controlled				
	WB Approach					
	NB Left-Turn					
	SB Approach					
Old NC 86 at I-40 EB Ramps	Overall Intersection	Signalized			D (50.9)	D (45.8)
	EB Approach				E (62.7)	E (55.4)
	NB Approach		E (77.7)	E (59.8)		
	SB Left-Turn		C (32.6)	C (34.8)		
Old NC 86 at Service Road	Overall Intersection	One-Way Stop Controlled	A (1.5)	A (6.2)		
	EB Approach		C (23.9)	E (40.3)		
	NB Left-Turn		A (8.8)	A (8.6)		
Old NC 86 at Davis Road	Overall Intersection	Signalized	B (11.3)	A (9.4)		
	EB Approach		C (23.1)	C (23.3)		
	NB Left-Turn		A (9.4)	A (7.9)		
	SB Approach		A (7.4)	A (6.1)		
Service Road at Warehouse A Driveway	Overall Intersection	One-Way Stop Controlled				
	EB Approach					
	NB Left-Turn					
Service Road at Warehouse B Driveway	Overall Intersection	One-Way Stop Controlled				
	WB Left-Turn					
	NB Approach					
Service Road at Warehouse C Driveway	Overall Intersection	One-Way Stop Controlled				
	WB Left-Turn					
	NB Approach					
Davis Road at Warehouse D Driveway	Overall Intersection	One-Way Stop Controlled				
	EB Left-Turn					
	SB Approach					

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

SimTraffic Operations
June 4, 2020

7.0 SIMTRAFFIC OPERATIONS

SimTraffic runs were completed for the build with improvements scenarios to observe the predicted traffic operations throughout the study with the recommendations in place. As is standard practice, ten (10) SimTraffic analysis runs were performed for the peak hours in the build with improvements scenario. The below table lists the 95th percentile queues in addition to the maximum observed queue lengths from SimTraffic. Detailed SimTraffic Queuing and Blocking reports can be found in the Appendix.

Table 8: Maximum Queue Length Summary

Intersection / Movement		Available Storage (feet)	2023 Build Improved AM Peak (feet)		2023 Build Improved PM Peak (feet)	
			95 th %'ile	Max Obs.	95 th %'ile	Max Obs.
Old NC 86 at Waterstone Drive	WBL	300	184	165	255	225
	NBL	200	4	14	4	19
	NBR	425	45	261	46	139
	SB Dual LT.	300	220	283	146	207
Old NC 86 at I-40 Westbound	WBL	225	117	193	100	149
	NBL	225	15	100	25	171
Old NC 86 at I-40 Eastbound	EBR	200	201	200	96	123
	SBL	continuous	774	694	695	620
Old NC 86 at Service Road	EBR	100	2.5	98	5	185
	NBL	50	2.5	115	0	54

Minimal queues were observed at Davis Road and the site driveways on both the Service Road as well as Davis Road. Accordingly, these queues were omitted from the above table.

8.0 RECOMMENDATIONS

Based on the findings of this study, specific improvements have been identified and are recommended to be completed as part of the proposed development. These improvements are listed below.

Old NC 86 at Waterstone Drive / Rippy Lane

No improvements are recommended at this intersection.

Old NC 86 at I-40 Westbound Ramps

No improvements are recommended at this intersection.

Old NC 86 at I-40 Eastbound Ramps

- Install a traffic signal.

The 2017 Settler's Pointe TIA concluded that this intersection met the criteria for installation of a traffic signal based upon their review of the 2016 collected traffic data against Traffic Signal Warrant 3B (Peak Hour Vehicular Volume)

Old NC 86 at Service Road

- Construct an exclusive eastbound right-turn lane with 100 feet of full-width storage and appropriate taper.
- Restripe the northbound approach to provide 50 feet of full-width storage and appropriate taper.

Old NC 86 at Davis Road

- Install a traffic signal. It is recommended that this signal not be installed until Driveway D is constructed and open to traffic.

Service Road at Warehouse A Driveway

- Construct Warehouse A Driveway as a single-lane approach operating under the control of a stop-sign.

Service Road at Warehouse B Driveway

- Construct Warehouse B Driveway as a single-lane approach operating under the control of a stop-sign.

Service Road at Warehouse C Driveway

- Construct Warehouse C Driveway as a single-lane approach operating under the control of a stop-sign.

Davis Road at Warehouse D Driveway

- Construct Warehouse D Driveway as a single-lane approach operating under the control of a stop-sign.

These recommendations are illustrated on Figure 12.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

Recommendations
June 4, 2020

Figure 12: Build Recommended Lane Configurations

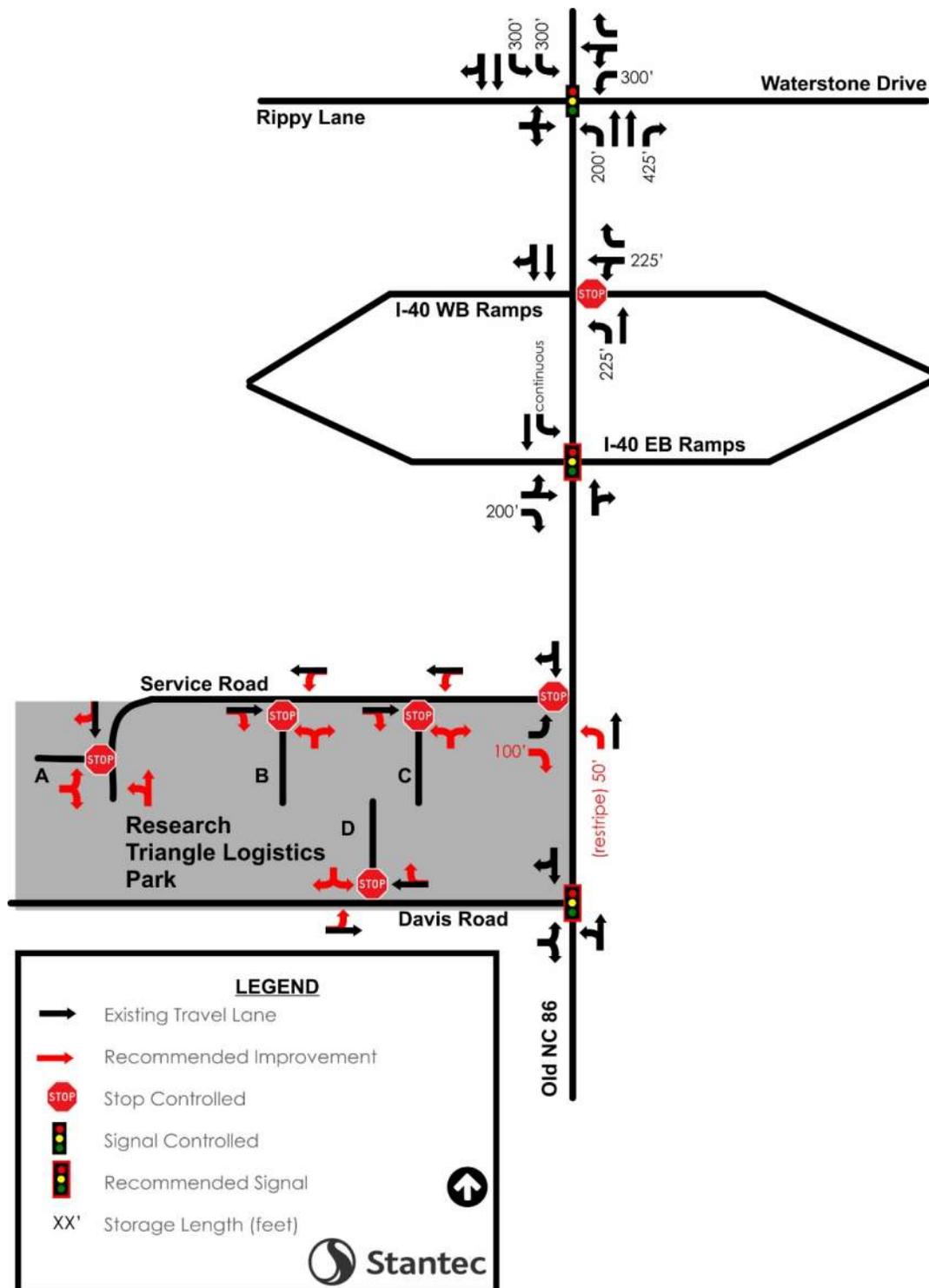


Figure is Not To Scale

9.0 CONCLUSIONS

Using the traffic analysis presented herein, recommendations are provided to mitigate the impacts associated with the proposed development. With the recommended improvements in-place all study intersections and approaches operate at LOS D or better during both peak hours; with three (3) exceptions:

- The westbound left-turn from the I-40 Westbound ramp onto Old NC 86 operates at LOS F. Stop-controlled approaches to intersections often operate with longer delays during peak hours. Additionally, the analysis shows that the existing turn-lane storage is not exceeded.
- The eastbound and northbound approaches to the intersection of Old NC 86 at I-40 Eastbound ramp operates at LOS E. However, the overall LOS at this intersection is D.
- The eastbound approach of the Service Road onto Old NC 86 operates at LOS E. Stop controlled approaches to intersections often operate with longer delays during peak hours.

The analysis presented herein is conservative as it assumes that a significant portion of Waterstone is completed by the time the proposed development is opened in 2023. Furthermore, NCDOT has two (2) planned projects in the area in U-5845 (Churton Street Widening) and I-3306A (I-40 Widening) that will make further improvements to transportation infrastructure within the study area.

RESEARCH TRIANGLE LOGISTICS PARK TRAFFIC IMPACT ANALYSIS

References / Appendix

June 4, 2020

10.0 REFERENCES

¹ **NCDOT Functional Classification Map,**

<http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792>

² **2017 NCDOT Average Daily Traffic Volumes,**

<https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b7a26d6d8abd419f8c27f58a607b25a1>

³ **Trip Generation (10th Edition),** Institute of Transportation Engineers (ITE), September 2017.

⁴ **Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis.** Washington D.C.: Transportation Research Board, 2016.

⁵ **NCDOT Congestion Management Capacity Analysis Guidelines.** North Carolina Department of Transportation (NCDOT), July 2015,

<https://connect.ncdot.gov/resources/safety/Congestion%20Mngmt%20and%20Signing/Congestion%20Management/Capacity%20Analysis%20Guidelines.pdf>

APPENDIX

A link containing all relevant files is electronically sent with this report:

- Site Plan
- NCDOT Scoping Checklist
- Settler's Pointe TIA
- Traffic Count Data
- Synchro Files
- SimTraffic Reports