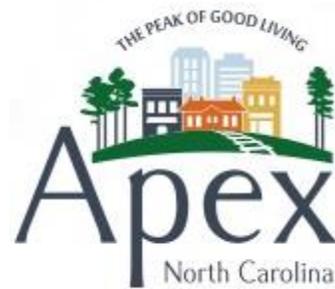


JESSIE DRIVE IMPROVEMENTS AND EXTENSION

FEASIBILITY STUDY REPORT



Prepared by
Kimley-Horn and Associates, Inc.
NC License #F-0102
for the
Town of Apex

Kimley»»Horn

January 2020



Table of Contents

1.0 Introduction1

2.0 Background1

 2.1 Related Studies 1

 2.2 Nearby Transportation Projects..... 2

3.0 Project Description4

 3.1 Technical Studies 4

 3.2 Concept Options 4

 3.3 Preferred Alternative..... 4

 3.4 Cost Estimates..... 5

4.0 Traffic Analysis.....6

 4.1 Traffic Forecast 6

 4.2 Traffic Operations 7

5.0 Natural Environment.....10

 5.1 Water Quality & Jurisdictional Resources 10

 5.2 Buffer Rules..... 12

 5.3 Federal Emergency Management Agency (FEMA) Resources..... 12

 5.4 Federally Protected Species..... 12

6.0 Human Environment13

 6.1 Community Resources 13

 6.2 Cultural Resources 13

 6.3 Environmental Justice Populations..... 13

 6.4 Surrounding Development..... 14

 6.5 Schools 15

 6.6 Indirect and Cumulative Effects..... 15

 6.7 Emergency Service Resources 15

 6.8 Relocations..... 15

7.0 Public Involvement16

8.0 Summary of Impacts16

9.0 References.....18



Figures

Figure 1: Vicinity Map

Figure 2: Environmental Features Map

Appendices

Appendix A: Project Input Forms

Appendix B: Public Comment Summary and Responses

Appendix C: CAMPO Projects Map

Appendix D: Technical Reports

- Traffic Forecast Report
- Natural Resources Technical Memo
- Community Characteristics Report
- Traffic Capacity Analysis Report

Appendix E: Public Meeting Maps

Appendix F: Functional Design Maps

1.0 Introduction

This feasibility study describes the proposed Jessie Drive Improvements and Extension project. This project proposes to improve and extend Jessie Drive from Ten Ten Road (SR 1010) to NC 55 (East Williams Street). The project is approximately 1.6 miles long, including 0.9 miles of roadway on new location, and proposes to add traffic signals at the intersections of Jessie Drive and NC 55, and Jessie Drive and Ten Ten Road. A superstreet intersection (also known as a reduced conflict intersection) is proposed at the intersection of Jessie Drive and NC 55. The proposed project location is shown on **Figure 1**.

The purpose of this feasibility study is to guide project planning by evaluating concepts and recommending a preferred alternative, providing a functional design and estimated costs, gathering and responding to initial public input, and identifying potential issues that may require consideration in future planning and design phases.

2.0 Background

The Town of Apex is located in Wake County and is adjacent to the Town of Cary to the north and east, the Town of Holly Springs to the south, and unincorporated Chatham County to the west. Apex is part of the Capital Area Metropolitan Planning Organization (CAMPO). Generally, land uses along the corridor consist of residences along the existing Jessie Drive and wooded area between NC 55 and Jessie Drive. Land use at the NC 55 and Ten Ten Road project termini is primarily commercial. Three developments (Horton Park, Veridea, and Jessie Commons) and one light industrial development (Cash Corporate Center) have been proposed along or adjacent to the Jessie Drive Extension corridor (shown on **Figure 2**).



Existing Jessie Drive near the western terminus

2.1 Related Studies

Several studies have been conducted that include the Jessie Drive corridor and support the proposed project. Additional detail about proposed surrounding development is in Section 6.4.



Connect 45, The Metropolitan Transportation Plan for the Capital Area Metropolitan Planning Organization (February 2018) recommends Jessie Drive be constructed as a two-lane road then later widened to a four-lane, median-divided roadway. The plan also calls for new local connector streets proposed to intersect Jessie Drive, including a future extension west of NC 55 to connect with the planned Veridea development.

The Town of Apex long range transportation plan, *Advance Apex: The 2045 Transportation Plan* (Advance Apex) (February 2019) identifies Jessie Drive improvements/extension between NC 55 and Ten Ten Road as one of the most frequently mentioned corridors for improvement based on input from the community and recommends it as a near-term priority. Advance Apex plans for side paths on both sides of Jessie Drive. It also identifies Jessie Drive as a future local bus route, although stops and pull outs are not identified. Jessie Drive is identified in both Advance Apex and the *Triangle Regional Freight Plan* as a strategic freight corridor. Advance Apex also noted that Middle Creek Greenway from the future Jessie Drive extension to Holly Springs is a committed project funded by development and municipal projects.

The *Wake Transit Plan* (2016) includes an express bus route from Holly Springs into downtown Cary using NC 55. The route is programmed for peak hour service beginning in 2020.

The Town of Apex's *2045 Land Use Map* (adopted February 2019) shows the extended portion of Jessie Drive is proposed to consist of "employment mixed use," with development potential including office, warehousing, tech/flex, and commercial. At the proposed intersection of NC 55 and Jessie Drive, a commercial area is shown on the land use map. On the south side of existing Jessie Drive where there is currently rural residential use, high density residential (townhomes and apartments), medium/high density residential (single-family homes and townhomes), and a mix of high density residential and office employment is shown. Other changes include a new park designation in the northwest quadrant of the Jessie Drive/Ten Ten Road intersection (currently Knights Play Golf Center), and mixed-used at the southwest corner of the intersection of Jessie Drive and Ten Ten Road.

Peak Plan 2030: The Apex Comprehensive Plan (August 2013) recommends preserving access and visibility of large parcels that could be developed as employment centers or mixed-use communities on key transportation corridors such as NC 55 and Jessie Drive. The plan recommends identifying new industrial, business, and office park sites totaling 100 to 150 contiguous acres on NC 55 and Jessie Drive for potential future non-retail employment growth.

2.2 Nearby Transportation Projects

Several other transportation projects are proposed near the Jessie Drive corridor. **Table 2-1** lists the North Carolina Department of Transportation (NCDOT) *2020-2029 State Transportation Improvement Program* (STIP) projects and **Table 2-2** lists the CAMPO *2045 Metropolitan Transportation Plan* (MTP) projects. Additional projects are listed in local plans, such as Advance Apex, but are not identified below.



Table 2-1: NCDOT 2020 – 2029 STIP Projects near Jessie Drive

STIP No.	Description	Right-of-Way	Construction	STIP Cost
U-5825	Widen Ten Ten Road from Apex Peakway in Apex to Kildaire Farm Road in Cary (this project includes side path and bike lanes on Ten Ten Road)	FY 2025	FY 2029	\$93,765,000
U-6066	Add lanes to US 1 from NC 55 in Apex to US 64 in Cary	FY 2025	FY 2029	\$62,889,000
EB-5895	Construct sidewalk along NC 55 (East Williams Street) from SR 1301 (Sunset Lake Road) to NC 55 in Holly Springs	FY 2019	FY 2020	\$600,000

FY – Fiscal Year

Table 2-2: CAMPO MTP Projects Near Jessie Drive

MTP No.	Description	Horizon Year	MTP Cost
A98	Widen NC 55 Bypass from North Main Street to Honeycutt Connector	2035	\$69,933,501
A218b	Extend Jessie Drive from Veridea Parkway to NC 55	2035	\$17,516,150
BP78	Construct Middle Creek Greenway from Pristine Water Drive to east of Wickham Ridge Road	N/A	N/A
BP327	Construct wide outside shoulder on NC 55 from McCrimmon Parkway to W Ballentine Road	N/A	N/A
BP401	Construct Bike Lane on Ten Ten Road from Penny Road to Benson Road	N/A	N/A
BP777	Construct wide outside shoulders on Jessie Drive (Future) from Friendship Road to Ten Ten Road	N/A	N/A
F110a	Convert interchange of US 1 and NC 55 to a Diverging Diamond Interchange	2035	\$22,300,000
T81	Add local bus service on NC 55 from Holly Springs to Cary	N/A	N/A

STIP project locations are included on **Figure 1** and a map of planned CAMPO projects in the vicinity are included in **Appendix C**.



3.0 Project Description

3.1 Technical Studies

The following technical reports have been completed in preparation of this feasibility study and are included in **Appendix D**:

- *Traffic Forecast Report* (March 2019)
- *Natural Resources Technical Memo* (March 2019)
- *Community Characteristics Report* (April 2019)
- *Traffic Capacity Analysis Report* (May 2019)

3.2 Concept Options

All alternatives proposed the same typical section, described in Section 3.3. The design from approximately 500 feet west of Hurdover Drive to the western terminus at NC 55 was the same for all three alternatives. From Ten Ten Road to west of Hurdover Drive, three alternatives were studied:

- Alternative 1 proposed widening to the south.
- Alternative 2 proposed a best fit widening.
- Alternative 3 proposed widening to the north.

Alternative 3 was eliminated early in the planning process because of higher potential property impacts. Functional designs were developed for Alternatives 1 and 2, which were shown at a public meeting (see graphics in **Appendix E**). Based on anticipated property impacts and feedback from the community, Alternative 2 was recommended as the preferred alternative.

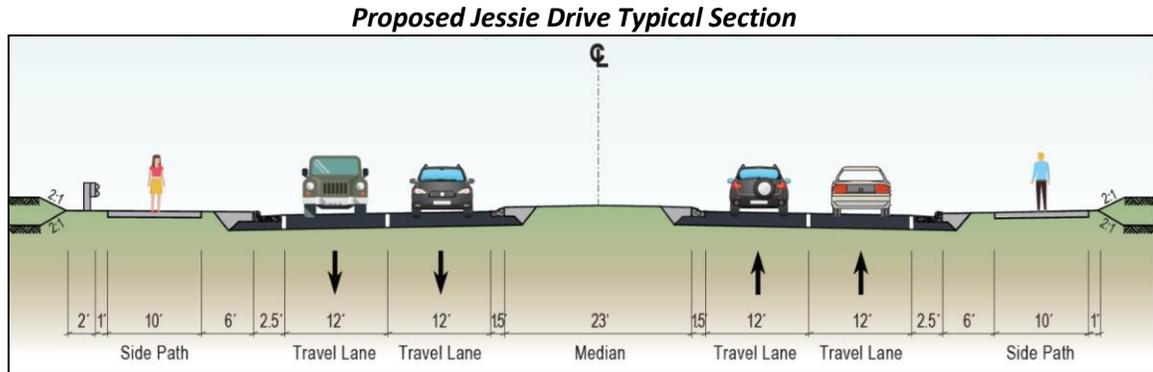
3.3 Preferred Alternative

The proposed functional design is shown on **Figure 2**. It should be noted that this design is subject to change during the project development process.

The Town proposes to construct this project first as a two-lane section, later widening it to a four-lane section. The two-lane section may be built in two phases, depending on funding: (1) improve and extend Jessie Drive as a two-lane undivided road with a 10-foot side path on both sides from Ten Ten Road to the proposed intersection with Production Drive and (2) extend Jessie Drive to NC 55 as a two-lane undivided road. Jessie Drive would then be widened later to a four-lane median-divided road with a side path on both sides. Right-of-way for the ultimate four-lane roadway would be acquired during the initial two-lane phase.

Building the project in phases gives the Town flexibility based on need and available funding. Projected traffic volumes do not currently warrant a four-lane road, but are anticipated to increase to the point where four lanes are needed. The Town can build segments when funds are available, or when developers partner to continue the project.

The proposed typical section for the four-lane design is below.



A superstreet intersection is proposed at the intersection of Jessie Drive and NC 55 as part of this project. This design would restrict left turns out of the Jessie Drive extension onto southbound NC 55, but would allow left turns onto Jessie Drive from southbound NC 55. A U-turn bulb would be included north of the new intersection to accommodate drivers wishing to go south on NC 55 from Jessie Drive, and a second U-turn bulb would be included south of the intersection to accommodate drivers wishing to head northbound from the future Jessie Drive extension. NC 55 would be widened to 6 lanes between the U-turn bulbs.

The benefits of a superstreet intersection are reduced potential conflicts between vehicles and more streamlined traffic signals which reduce overall delays for drivers. Information about the potential superstreet at NC 55 was included on the public meeting map. Since the public meeting, the functional design of the superstreet intersection has been completed and the alignment of Jessie Drive west of the existing section has shifted to minimize overlap between the proposed road and the existing water line, keeping the water line in the shoulder where possible based on NCDOT guidance. The public meeting maps are included in **Appendix E**, and the most current functional-level design is in **Appendix F**.

3.4 Cost Estimates

Conceptual construction and right-of-way cost estimates have been prepared for the two-lane undivided and four-lane divided alternatives, as well as the superstreet at NC 55. These are summarized in **Table 3-1**.



Table 3-1: Cost Estimates

Scenario	Cost
Interim 2-lane	
Phase 1 - Jessie Drive from Ten Ten Road to Production Drive with side path on north only	
Construction	\$4,800,000
Right of way*	\$650,000
Total (Phase 1)	\$5,450,000
Phase 2 - Jessie Drive from Production Drive to NC 55 with side path on north only	
Construction of Roadway (without NC 55 Superstreet)	\$4,800,000
Construction of NC 55 Superstreet	\$5,200,000
Right of Way*	\$1,160,000
Total (Phase 2)	\$11,160,000
Grand total for interim 2-lane	\$16,610,000
Ultimate 4-lane: Jessie Drive from Ten Ten Road to NC 55**	
Construction (without NC 55 Superstreet)	\$15,300,000
Construction of NC 55 Superstreet	\$5,200,000
Right of Way*	\$1,810,000
Grand total for ultimate 4-lane (Phase 1 and Phase 2)	\$22,310,000

*Estimated by Apex staff, assuming no relocations, for right of way and easements

**Assumes no interim 2-lane section; cost of widening from 2-lane to 4-lane and adding path on south side would be approximately the difference between the interim 2-lane and ultimate 4-lane grand total scenarios

These estimates assume a culvert will be constructed at Middle Creek. The Town proposes to build a two-lane road with turn lanes as needed on a four-lane right-of-way, with ultimate four-lane widening occurring when needed to serve increased traffic in the long-term horizon as funding becomes available. These costs are not final and are subject to change during project development.

4.0 Traffic Analysis

4.1 Traffic Forecast

The *Traffic Forecast Report* (March 2019) summarized projected traffic volumes for four scenarios:

- 2018 No Build
- 2018 Build
- 2045 No Build
- 2045 Build

Table 4-1 shows existing and forecasted traffic volumes in the project area. It was assumed that the future western extension of Jessie Drive (from NC 55 west to Old Holly Springs Apex Road) would be constructed by 2035 regardless of the construction of the Jessie Drive Improvements and Extension project, and was included in both the 2045 No Build and 2045 Build forecast models. Although there is no current funding for the extension of Jessie Drive west of NC 55, it is anticipated to be built as part of future development efforts that may involve the proposed



Veridea Development. All other funded projects in the STIP and MTP were also included in the traffic forecast model as part of the 2045 scenarios.

Table 4-1: Traffic Volumes

Location	2018 No Build	2018 Build	2045 No Build	2045 Build
Jessie Drive west of Ten Ten Rd	300 vpd	5,800 vpd	300 vpd	9,000 vpd
Jessie Drive Ext east of NC 55	-	6,300 vpd	-	13,500 vpd
Jessie Drive Ext west of NC 55 (unfunded section)	-	-	9,400 vpd	13,400 vpd

VPD – vehicles per day

4.2 Traffic Operations

Traffic forecasts from the *Traffic Forecast Report* were used to develop design hourly volumes for traffic operations analysis. Traffic operations were analyzed during the weekday A.M. and P.M. peak hours of travel. The *Traffic Capacity Analysis Report* (May 2019) analyzed traffic operations at the intersections of Jessie Drive and Ten Ten Road, and Jessie Drive and NC 55 for the following five scenarios:

- 2022 No Build (Opening Year)
- 2022 Build (Opening Year)
- 2035 Build (Interim Year)
- 2045 No Build
- 2045 Build

The 2022 No Build Scenario assumed that 50 percent of the Horton Park development will be built-out, and roadway improvements committed by the development at the intersection of Jessie Drive and Ten Ten Road will be constructed. These improvements included signalization and construction of a northbound left-turn lane with 50 feet of storage and a southbound right-turn lane with 100 feet of storage on Ten Ten Road.

In the 2022 Build Scenario, the same assumptions were made about the build-out phase of the Horton Park development; however, it was determined that once Jessie Drive is connected, additional intersection improvements will be required on both ends of the corridor to meet the minimum traffic operations Level of Service (LOS) criteria (LOS D) set forth by the project. At the intersection of Ten Ten Road and Jessie Drive, these improvements included signalization, construction of a northbound left turn lane with 100 feet of storage, a southbound right turn lane with 300 feet of storage, and reconstruction of the Jessie Drive eastbound approach to provide a left turn lane with 200 feet of storage, and a separate right turn lane. At the intersection of NC 55, it was determined that the superstreet design was the most practical solution to serving the high traffic demands of the NC 55 corridor while maintaining the minimum intersection LOS criteria. Roadway improvements at the intersection of NC 55 and Jessie Drive included widening of NC 55 to provide 3 through lanes in the northbound and southbound directions, a southbound left turn lane with 300 feet of storage, and dual



westbound right turn lanes on Jessie Drive with 200 feet of storage on the outside lane. To accommodate left-turning vehicles from Jessie Drive within the superstreet context, a signalized U-turn intersection with a bulb-out for heavy vehicles was required north of the intersection on NC 55, with a northbound U-turn lane that provides a minimum of 300 feet of storage. Based on the traffic demand, it was determined that Jessie Drive can be constructed as a two-lane, bi-directional roadway between the two terminus points of Ten Ten Road and NC 55 in the 2022 Build Scenario.

In the 2035 Build Scenario, it's assumed that the western extension of Jessie Drive (from NC 55 west to Old Holly Springs Apex Road) will be constructed by others, and the superstreet intersection of NC 55 will require additional roadway improvements to maintain the minimum intersection LOS criteria. These improvements included a southbound right turn lane with 200 feet of storage and a northbound left turn lane with 250 feet of storage at the intersection of NC 55 and the Jessie Drive Western Connection. Additionally, to accommodate left-turning vehicles from the Western Connection within the superstreet context, a signalized U-turn intersection with a bulb-out for heavy vehicles will be required south of the intersection on NC 55, with dual southbound U-turn lanes that provide a minimum of 250 feet of storage. On the east side of the superstreet, roadway improvements include a northbound right turn lane on NC 55 with 200 feet of storage, and dual eastbound right turn lanes on Jessie Drive with 300 feet of storage on the outside lane. At the North U-turn intersection, dual northbound U-turn lanes with 300 feet of storage will be required to meet the intersection LOS criteria. On the other side of the corridor, at the intersection of Ten Ten Road and Jessie Drive, roadway improvements from NCDOT Project U-5825 are anticipated to be constructed. These improvements include dual northbound through lanes and three southbound through lanes on Ten Ten Road, as well as a northbound left turn lane with 400 feet of storage. The eastbound approach of Jessie Drive will require a left turn lane and a right turn lane with 250 feet of storage to meet the minimum intersection LOS criteria. Based on the traffic demand, it was determined that Jessie Drive can remain a two-lane, bi-directional roadway between the two terminus points of Ten Ten Road and NC 55 in the 2035 Build Scenario.

In the 2045 No Build Scenario, it's assumed that the improvements from NCDOT's Project U-5825 (as described above) will be constructed at the intersection of Ten Ten Road and Jessie Drive. Additionally, traffic operations analysis showed that an eastbound left turn lane and an eastbound right turn lane with 150 feet of storage will be required on Jessie Drive. At the intersection of NC 55 and Jessie Drive, it was assumed that the Jessie Commons Development will construct the third leg (eastbound approach) of Jessie Drive on the east side of NC 55, and that the Western Connection will be constructed by others on the west side of NC 55, regardless of whether the Jessie Drive Improvements and Extension Project from Ten Ten Road to NC 55 is constructed or not. Under the 2045 No Build Scenario, it's assumed that NC 55 will be a 6-lane superstreet with North and South U-turn intersections. Single northbound and southbound left and right turn lanes are assumed at the intersection of Jessie Drive, and single northbound and southbound U-turn lanes are assumed at the North and South U-turn intersections. Both the



eastbound (Jessie Drive) and westbound (Western Connection) approaches at NC 55 are assumed to have dual right turn lanes.

The 2045 Build Scenario assumed all improvements in the 2035 Build Scenario in addition to widening of Jessie Drive to four-lanes between Ten Ten Road and NC 55, tying the eastbound lanes into the right- and left-turn lanes at Ten Ten Road, and the westbound lanes into the dual right-turn lanes at NC 55.

Six levels of service (LOS), from A to F, were used to describe traffic operations at each intersection on the corridor for the above scenarios. LOS A represents minimum vehicle delays at the intersection. At signalized intersections LOS A represents conditions when most vehicles arrive during the green indication, and travel through the intersection without stopping. LOS F represents excessive vehicle delays and operational failure at the intersection. At signalized intersections progression is slow, and most cycles fail to clear the queue. The minimum intersection LOS criteria set forth by the Jessie Drive Improvements and Extension project was LOS D, per NCDOT Congestion Management guidelines.

Table 4-2 summarizes the LOS thresholds established for automobiles at signalized intersections.

Table 4-2: Level of Service Definitions for Signalized Intersections

Level of Service	Average Delay per Vehicle (seconds)	Description
A	< 10	Little or no delay
B	10 to 20	Short traffic delays
C	20 to 35	Average traffic delays
D	35 to 55	Longer but acceptable delays
E	55 to 80	Very long traffic delays
F	> 80 (or v/c > 1.0)	Operational breakdown

Source: Highway Capacity Manual (6th Edition) Chapter 19 Exhibit 19-8

Tables 4-3 and **4-4** summarize traffic operations at the intersections of Jessie Drive with Ten Ten Road and NC 55 for the A.M. and P.M. peak hours of travel. The capacity analysis assumed a signalized superstreet design at Jessie Drive and NC 55 (with the future western leg of the intersection in place) and a signalized intersection at Jessie Drive and Ten Ten Road. For Jessie Drive at NC 55 superstreet design, the LOS is reported for each signal, denoted by northbound (NB) and southbound (SB) approaches.

Table 4-3: Intersection Capacity Analysis (Jessie Drive at Ten Ten Road)

Scenario	Jessie Drive at Ten Ten Road	
	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
2022 No Build	B (18.2)	B (13.8)
2022 Build	C (22.7)	D (35.2)
2035 Build	C (20.3)	C (21.4)
2045 No Build	B (19.7)	B (15.4)
2045 Build	C (27.7)	C (33.1)

Delay is measured in seconds.

Table 4-4: Intersection Capacity Analysis (Jessie Drive at NC 55)

Scenario	Jessie Drive North U-turn Bulb		Jessie Drive at NC 55		Jessie Drive Ext (West) South U-turn Bulb	
	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)	AM Peak Hour LOS (Delay)	PM Peak Hour LOS (Delay)
2022 No Build	-	-	-	-	-	-
2022 Build	A (8.5)	B (14.5)	NB - B (17.6) SB - B (16.9)	NB - B (16.5) SB - B (14.3)	-	-
2035 Build	B (11.4)	B (17.5)	NB - B (16.5) SB - B (16.9)	NB - B (19.6) SB - B (14.3)	B (18.1)	B (13.5)
2045 No Build	B (11.3)	C (21.0)	NB - B (12.4) SB - B (14.6)	NB - B (12.6) SB - B (13.7)	C (28.3)	B (13.7)
2045 Build	B (14.1)	D (36.0)	NB - C (30.3) SB - C (26.2)	NB - C (34.4) SB - B (19.2)	C (23.1)	B (12.5)

NB – northbound; SB - southbound

5.0 Natural Environment

A preliminary review of the environmental resources within the project study corridor was conducted by Kimley-Horn environmental scientists on August 13, August 20, and September 13, 2018.

5.1 Water Quality & Jurisdictional Resources

The project is located in both the Cape Fear and Neuse River Basins. Water resources were investigated within the study area plus 50 feet outside of the project boundary to account for any regulated Neuse River Riparian Buffers. Seven jurisdictional streams were identified, and are described in **Table 5-1** and shown on **Figure 2**. Impacts are anticipated to four streams based on the functional-level ultimate (four-lane) design.

Table 5-1: Jurisdictional Streams in the Study Area

Stream Name	Map ID	Flow Regime	Best Usage Classification	Subject to Buffer Rules	Impacts*
Middle Creek	Middle Creek	Perennial	C; NSW	Yes	290 ft
UT to Middle Creek	S1	Intermittent	C; NSW	Yes	-
UT to Middle Creek	S2	Perennial	C; NSW	Yes	180 ft
UT to Middle Creek	S3	Intermittent; Perennial	C; NSW	Yes	70 ft
UT to Middle Creek	S4	Perennial	C; NSW	Yes	225 ft
UT to Little Branch	S6	Intermittent; Perennial	C	No	-
UT to Little Branch	S7	Intermittent	C	No	-
Total					765 ft

* Impacts are based on the functional-level ultimate (4-lane) design.

C – Waters protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life including propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner.

NSW – Nutrient Sensitive Waters

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of waters not meeting federal water quality standards or which have impaired uses. Middle Creek within the project corridor is listed on the 2018 Final 303(d) list of impaired waters for having a Benthos rating of “Fair.” No streams within the project study area, or within 1.0 mile downstream of the study area, are identified on the 2018 Final 303(d) list of impaired waters for sedimentation or turbidity. There are no water supply watersheds, Outstanding Resource Waters, or High Quality Waters within the study corridor or within one mile downstream of the study area.

Three wetlands were identified in the project corridor during field investigations, as shown on **Figure 2**. Impacts are anticipated to two of the wetlands based on the functional-level ultimate design, as shown in **Table 5-2**.

Table 5-2: Jurisdictional Wetlands in the Study Area

Map ID	Wetland Type	Impacts *
W1	Headwater Forest	0.5 acres
W2	Bottomland Hardwood Forest	1.7 acres
W3	Bottomland Hardwood Forest	0.1 acres
Total		2.3 acres



Wetland in the new location section of the study area

* Impacts are based on the functional-level ultimate (4-lane) design.



Jurisdictional waters of the United States, including wetlands, are protected under Section 404 of the CWA. Any action that proposes impacts to waters of the United States falls under the jurisdiction of the US Army Corps of Engineers (USACE) through Section 404 of the CWA (33 United States Code [USC] 1344) and under the jurisdiction of the NC Department of Environmental Quality (NCDEQ) through the Section 401 Water Quality Certification Process (NC General Statutes Chapter 143 Article 21, Part 1). Encroachments into areas determined as subject under the CWA must be reviewed and approved by the USACE through the Section 404 program.

5.2 Buffer Rules

The eastern portion of the project corridor is located within the Nurse River Basin; therefore, streamside riparian areas may be subject to the Neuse River Basin Buffer Rules administered by the North Carolina Division of Water Resources (NCDWR). In addition to the buffer requirements administered by NCDWR, the Town of Apex Unified Development Ordinance (UDO) requires an additional 50-foot buffer be placed on all perennial streams.

5.3 Federal Emergency Management Agency (FEMA) Resources

Protection of floodways and floodplains is required under 23 CFR 650A; Executive Order 11988, Floodplain Management; and US Department of Transportation Order 550.2, Floodplain Management and Protection. The intent of these regulations is to avoid or minimize highway encroachments within the 100-year (base) floodplains or regulatory floodway, where predictable, and to avoid supporting land use development that is incompatible with floodplain values.

The FEMA Digital Flood Insurance Rate Map (DFIRM) 3720074100J (effective May 2, 2006) indicates the Middle Creek FEMA regulated floodway, 100-year floodplain, and 500-year floodplain are in the project area (see **Figure 2**).

5.4 Federally Protected Species

Species with a federal status of endangered or threatened are protected under provisions of the Endangered Species Act (ESA) of 1973 as amended (16 USC 1531 et. seq.). Any action that may adversely affect a federally protected species is subject to review by the United States Fish and Wildlife Service (USFWS). As of May 15, 2019 (updated June 27, 2018) USFWS lists seven federally protected species and three species proposed to be listed known to occur in Wake County (**Table 5-3**).

Table 5-3: Federally Protected Species in Wake County

Species	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Haliaeetus leucocephalus</i>	Bald eagle	BGPA	No	No Effect
<i>Rhus michauxii</i>	Michaux's sumac	E	No	No Effect
<i>Notropis mekistocholas</i>	Cape Fear shiner	E	No	No Effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No	No Effect
<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	E	No	No Effect
<i>Parvaspina steinstansana</i>	Tar River spinymussel	E	No	No Effect
<i>Elliptio lanceolata</i>	Yellow lance	T	No	No Effect
<i>Fusconaia masoni</i>	Atlantic pigtoe	P	No	No Effect
<i>Necturus lewisi</i>	Neuse River waterdog	P	TBD	Unresolved
<i>Noturus furiosus</i>	Carolina madtom	P	TBD	Unresolved

BGPA – Bald and Golden Eagle Protection Act, E – Endangered, T – Threatened, P – Proposed to be listed Threatened

The Neuse River waterdog and Carolina madtom are proposed to be listed as threatened under the ESA. If listed prior to construction authorization, a habitat evaluation and potentially surveys will need to be completed to determine if there is an effect on these species from this project.

6.0 Human Environment

6.1 Community Resources

There are no community resources (i.e., churches, community centers) in the study area. Knight's Play Golf Center is a private golf course adjacent to Jessie Drive at the eastern end of the project. **Figure 2** shows the businesses and neighborhoods in the vicinity of the project study corridor.



Knight's Play Golf Center

6.2 Cultural Resources

A review of the NC State Historic Preservation Office (SHPO) HPOWEB GIS Service revealed no known properties or structures determined eligible for or listed on the National Register of Historic Places in the project area. Additional survey for historic architecture and archaeology resources may be required during the next phase of this project.

6.3 Hazardous Materials

The North Carolina Division of Waste Management Site Locator Tool noted three underground storage tank incident sites along NC 55 near the proposed intersection with Jessie Drive. These sites are shown on **Figure 2**. A field survey, a Phase 2 study, and coordination with the Division



of Waste Management may be required for the project if these sites are anticipated to be impacted.

6.4 Environmental Justice Populations

The North Carolina Department of Transportation (NCDOT) Demographic Screening tool was used to obtain information on populations meeting the criteria for Environmental Justice, protected by Title VI and related statutes, or meeting or exceeding the U.S. Department of Justice Limited English Proficiency (LEP) Safe Harbor threshold in the project vicinity. The project is located within Census Tract 534.2, Block Group 2.

Census data did not indicate a notable presence of populations meeting the criteria for Environmental Justice as protected by Title VI and related statutes, but low-income communities including several mobile homes were observed along Jessie Drive. Impacts to minority and low-income populations do not appear to be disproportionately high and adverse.

Census data indicates a Spanish language-speaking population that meets or exceeds the LEP Safe Harbor threshold with 271 Spanish-speaking individuals that speak English less than very well. The local planner also noted that services near the project area are frequently used by LEP populations. No Spanish-speaking communities were observed along Jessie Drive.

To ensure the identified populations received full and fair participation in the public involvement process, bilingual postcards advertising the public meeting were mailed via traditional US Postal Service direct mail and US Postal Service Every Door Direct Mail (EDDM) services. EDDM provides a more thorough method of reaching non-owner-occupied properties.

6.5 Surrounding Development

According to the Town of Apex's Interactive Development Map, the **Horton Park** development is proposed south of Jessie Drive, near the current western dead end of Jessie Drive. The first phase of the Horton Park development includes up to 323 single family units, 270 townhomes, and 314 apartments. A second phase would include commercial and industrial/office employment use. Based on recent input from the Horton Park developer, the first phase may include a new driveway to Jessie Drive, or may initially only have access only to the south and east. The second phase would likely have frontage on Jessie Drive. The Horton Park developer may make improvements to existing Jessie Drive, build a short segment of the extension, and/or add turn lanes at the Jessie Drive/Ten Ten Road intersection; the improvement requirements will be determined by coordination between the developer, the Town of Apex, and NCDOT. Regardless of what is included, the improvement and extension will not complete the typical section proposed by the Town of Apex project.

The **Jessie Commons** development is proposed in the northeast and southeast quadrants of the proposed intersection of Jessie Drive and NC 55. The development would consist of



approximately 64 acres of commercial and office/industrial space. **Veridea** is a proposed sustainable, mixed-use urban community west of NC 55 on 1,100 acres. The approved entitlements for Veridea include 8,000 residential units, 12 million square feet of office/industrial space, 3.5 million square feet of retail space, and unrestricted hospitality, healthcare, and community uses. The potential future Jessie Drive segment west of NC 55 would provide access to this site. **Cash Corporate Center** is a proposed 121-acre industrial site northwest of existing Jessie Drive between Ten Ten Road and NC 55.

6.6 Schools

Wake County Public School System (WCPSS) was contacted for input on how the proposed Apex SE Connector may affect school busing. No school buses currently use Jessie Drive, but WCPSS noted that the proposed project would be a benefit by providing an alternative route for school bus service. A new high school is planned south of Jessie Drive, with the main point of access likely from the east via Stephenson Road (see **Figure 1**). The input form is located in **Appendix A**.

6.7 Indirect and Cumulative Effects

The project may alter travel patterns, reduce travel time, affect access to properties in the area, or open areas for development or redevelopment. Due to the potential transportation impact-causing activities, this project may influence nearby land uses or stimulate growth. Therefore, a detailed indirect and cumulative effects study is recommended during the next phase of project development.

6.8 Emergency Service Resources

Local emergency service providers were contacted for input on how the proposed project may affect their response times. The annexed areas in the vicinity of the Jessie Drive corridor, which include Colvin Park (between Smith Road and Stephenson Road) and future Horton Park (south of Jessie Drive and west of Smith Road), receive emergency services from the Town of Apex, but these areas are difficult to access. Currently, the Town of Cary Fire Station 6 (at Kildaire Farm Road and Ten Ten Road) is the assigned first responder to this area. Once Jessie Drive is complete, it is anticipated that Wake County EMS (located at the Town of Apex Fire Station 4) will respond to the area instead, thereby reducing response times. The input form is located in **Appendix A**.

6.9 Relocations

Based on the functional design, two residential acquisitions are possible as part of the ultimate design. A field review of the corridor noted that these structures appear to be abandoned. The proposed superstreet intersection on NC 55 would likely affect the driveways of two businesses, but both businesses have additional driveways and the use and buildings are not expected to be affected.



7.0 Public Involvement

A public meeting was held on May 16, 2019 at the Apex Town Hall. A total of 15 members of the public attended the public meeting. Public concern was generally related to potential increased EMS response time and decreased access for residents due to the proposed median along Jessie Drive. A more detailed analysis of the public comments and responses to the comments is in **Appendix B**.

8.0 Summary of Benefits, Considerations, and Impacts

8.1 Benefits

Extending and widening Jessie Drive would provide additional connection between Ten Ten Road and NC 55 for drivers, pedestrians, and bicyclists. The new route would be an important link, especially for trucks as industrial developments in this area expand. The improved connection may reduce congestion on Ten Ten Road and NC 55, and would increase access to proposed developments.

8.2 Considerations

Due to potential impacts to jurisdictional resources, careful consideration should be taken during final design to ensure each segment has logical termini and independent utility. An Individual Section 404 Permit may be required if wetland and stream impacts are not avoided or minimized. A detailed analysis is recommended at Middle Creek to compare a bridge (which would have a higher cost) with a culvert (which would have a lower cost but higher impacts and may increase the base flood elevation).

8.3 Impacts

Potential impacts of the proposed project, based on functional designs for the ultimate design of the preferred alternative, are summarized in **Table 8-1**. Avoidance and minimization measures will be investigated during final design.



Table 8-1: Potential Impact Summary

Resource	Impact
Residential Relocations	2 (currently vacant)
Business Relocations	0
Mobility and Access	Change to right-in/right-out access for most adjacent properties and streets
Multimodal Accommodations	10-foot side path on both sides
Consistency with Local Plans	Consistent
Parks	None
Streams*	Approximately 765 linear feet
Wetlands*	Approximately 2.3 acres
Historic Resources	None
Community Resources	None
Hazardous Materials	3 nearby, additional study may be needed
Travel Time	Reduction anticipated
Environmental Justice Populations	Disproportionate impacts to minority and low-income populations are not anticipated
Surrounding Development	No effect on current development; accommodates proposed future development patterns
Educational Resources	Beneficial to school bus transportation
EMS Resources	Benefit response times and access through the study area
Indirect and Cumulative Effects	Anticipated to influence nearby land uses or stimulate growth

* Assumes a 25-foot buffer from slope-stakes



9.0 References

Key resources used for this report are listed below. Additional resources for the individual technical reports are included in those documents.

Advance Apex (February 2019), <http://www.apexnc.org/1193/Advance-Apex>

Apex Comprehensive Plan: Peak Plan 2030, The Peak of Good Living (2013)
<https://www.apexnc.org/DocumentCenter/View/494/Peak-Plan-2030-PDF?bidId=>

Apex Comprehensive Transportation Plan (February 2019),
<https://www.apexnc.org/DocumentCenter/View/26449/Comprehensive-Transportation-Plan?bidId=>

Apex Interactive Development Map,
<http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795>

Apex Land Use Map (February 2018), [*Advance Apex: The 2045 Land Use Map Update*](#) and [*2045 Land Use Map*](#)

Apex Parks, Recreation, Greenways, and Open Space Master Plan Map (Revised 2016),
<https://www.apexnc.org/DocumentCenter/View/9268/ParksRecMasterPlan22316?bidId=>

Apex Parks & Greenways Map,
<https://www.apexnc.org/DocumentCenter/View/1046/Printable-Facilities--Greenways-Map?bidId=>

Apex Transit Plan Map, <https://www.apexnc.org/DocumentCenter/View/488/Transportation-Plan---Transit-Plan-Map-PDF?bidId=>

Apex Transportation Plan, Bicycle, Pedestrian, and Equestrian Plan map (amended March 2018),
<https://www.apexnc.org/DocumentCenter/View/486/Transportation-Plan---Pedestrian-Plan-Map-PDF?bidId=>

Apex Transportation Plan, Thoroughfare and Collector Street Plan map (adopted February 2019), <https://www.apexnc.org/DocumentCenter/View/487/Transportation-Plan---Thoroughfare-and-Collector-Street-Plan-Map-PDF?bidId=>

Apex Zoning Map (amended March 8, 2019),
<https://www.apexnc.org/DocumentCenter/View/493/Zoning-Map-PDF?bidId=>

Bike Apex (January 2019), <http://www.apexnc.org/1250/Bike-Apex>

Cash Corporate Center, <https://www.apexnc.org/1279/Cash-Corporate-Center>



FEASIBILITY STUDY REPORT – JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, NC

Connect 2045, The Metropolitan Transportation Plan for the Capital Area Metropolitan Planning Organization (February 2018), http://files.www.campo-nc.us/transportation-plan/draft-2045-metropolitan-transportation-plan/Final_Report/Connect2045_MTP_v2_021918.full.pdf

Horton Park Zoning Petition, http://www.apexnc.org/DocumentCenter/View/21495/18CZ04HortonPark_Ordinance?bidId=

Jessie Commons, <https://trello.com/c/5dk19Htw/30-jessie-commons>

Veridea Development, <https://www.apexnc.org/910/Veridea>



Figures

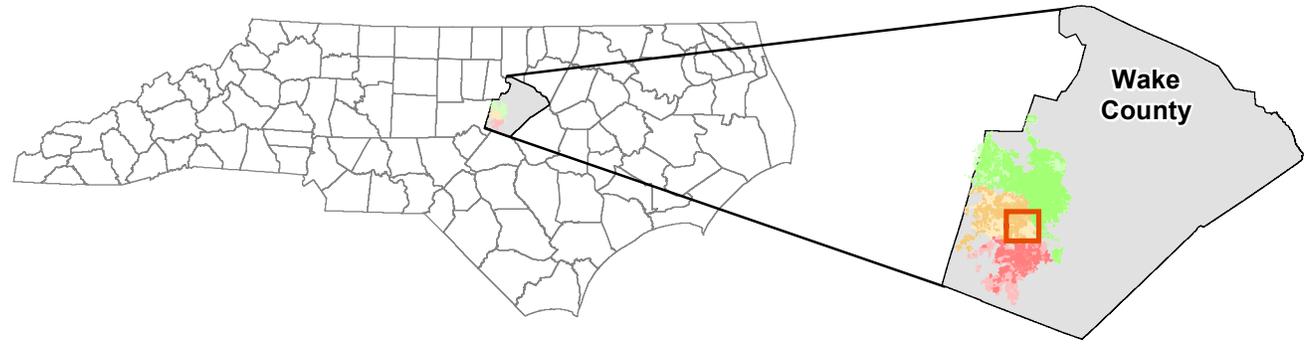
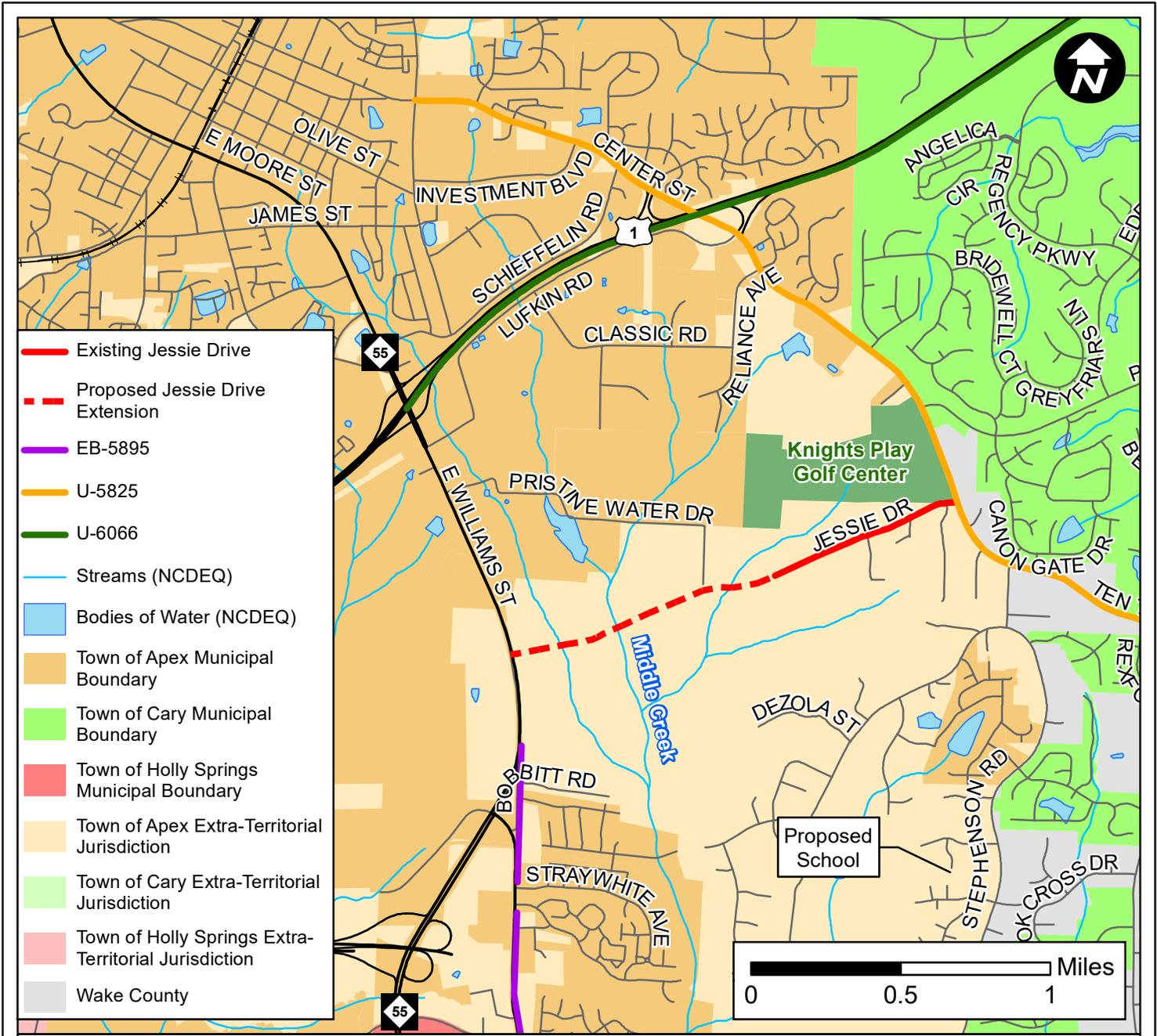
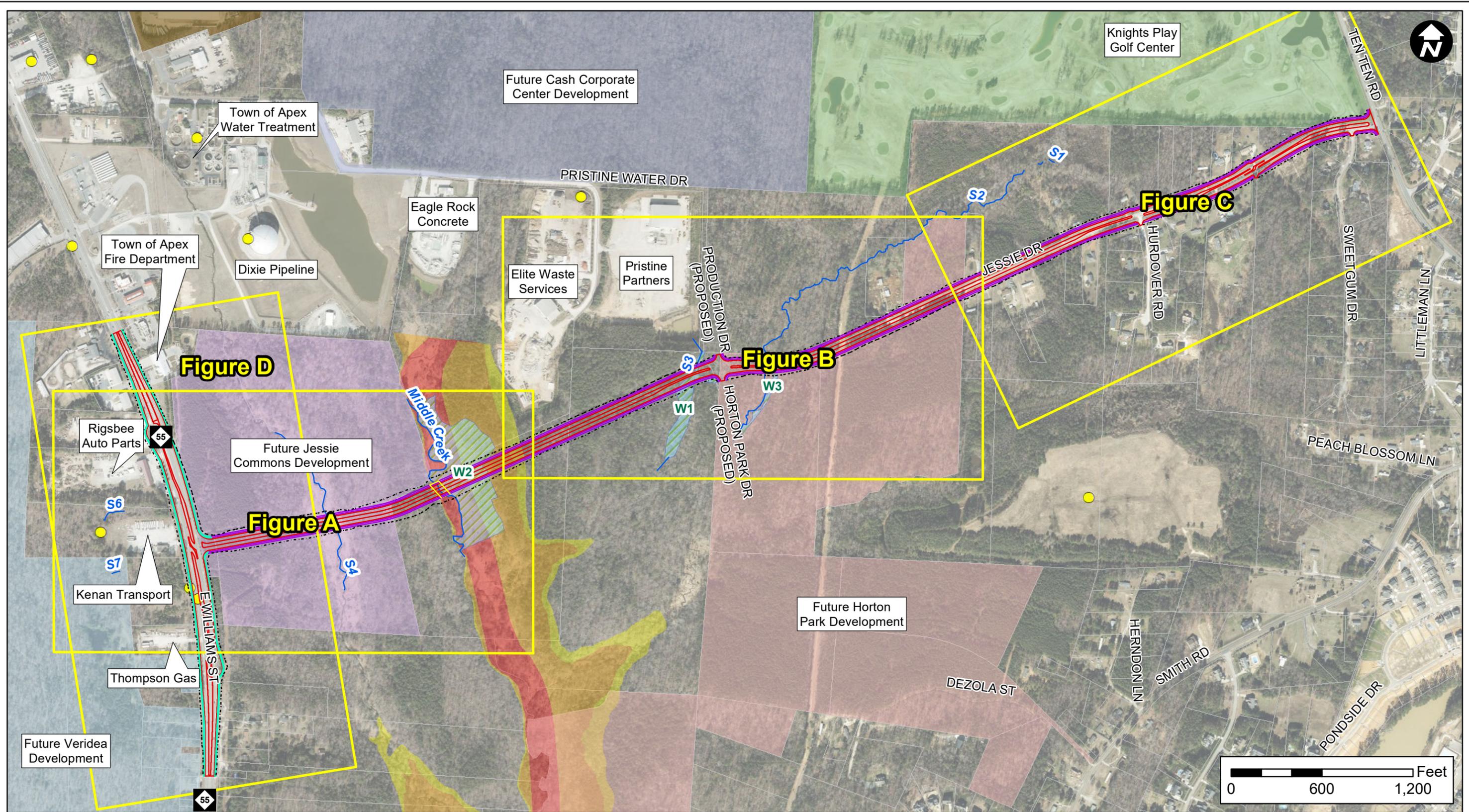
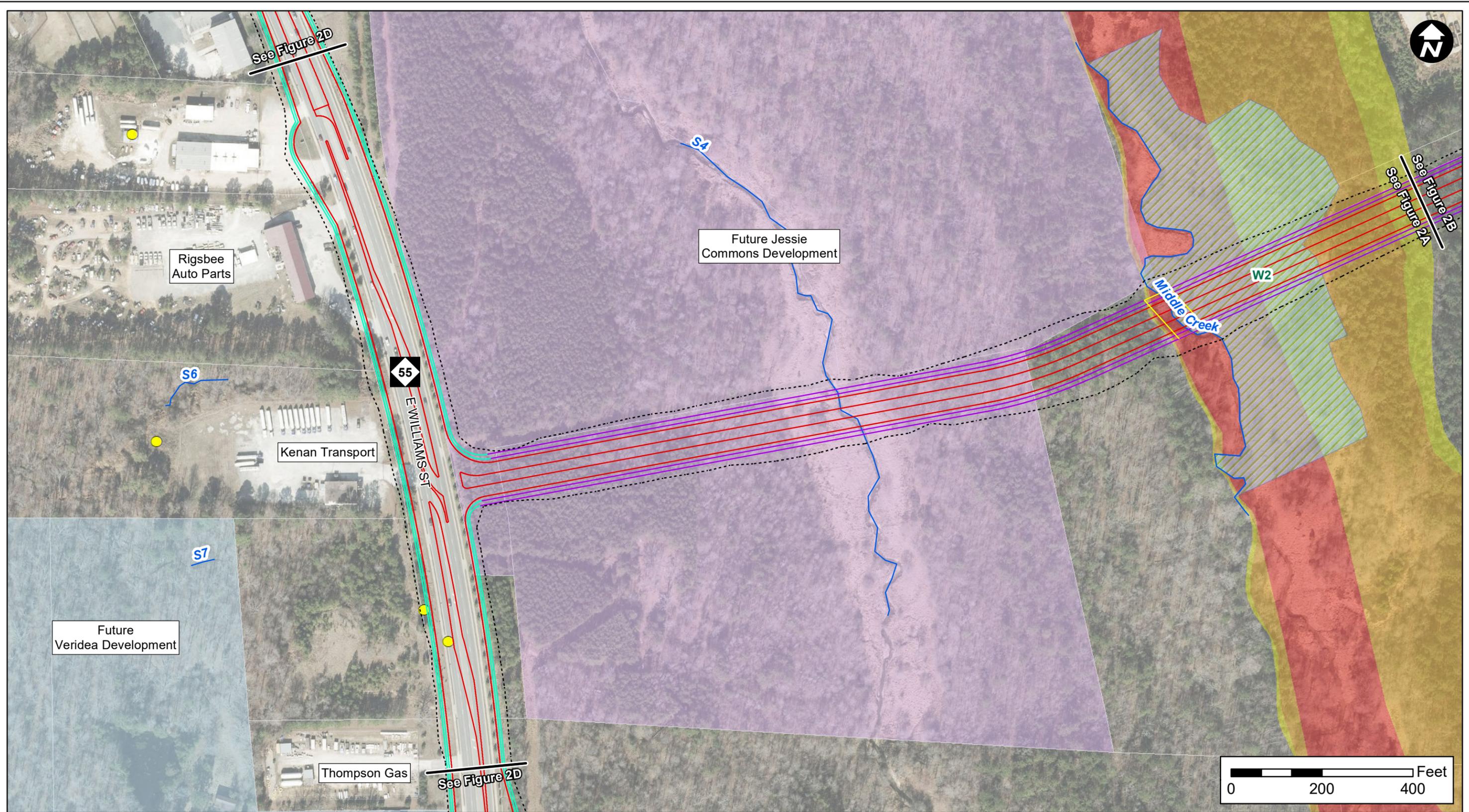


Figure 1
Vicinity Map
 Jessie Drive Improvements
 and Extension Project
 Town of Apex
 Wake County



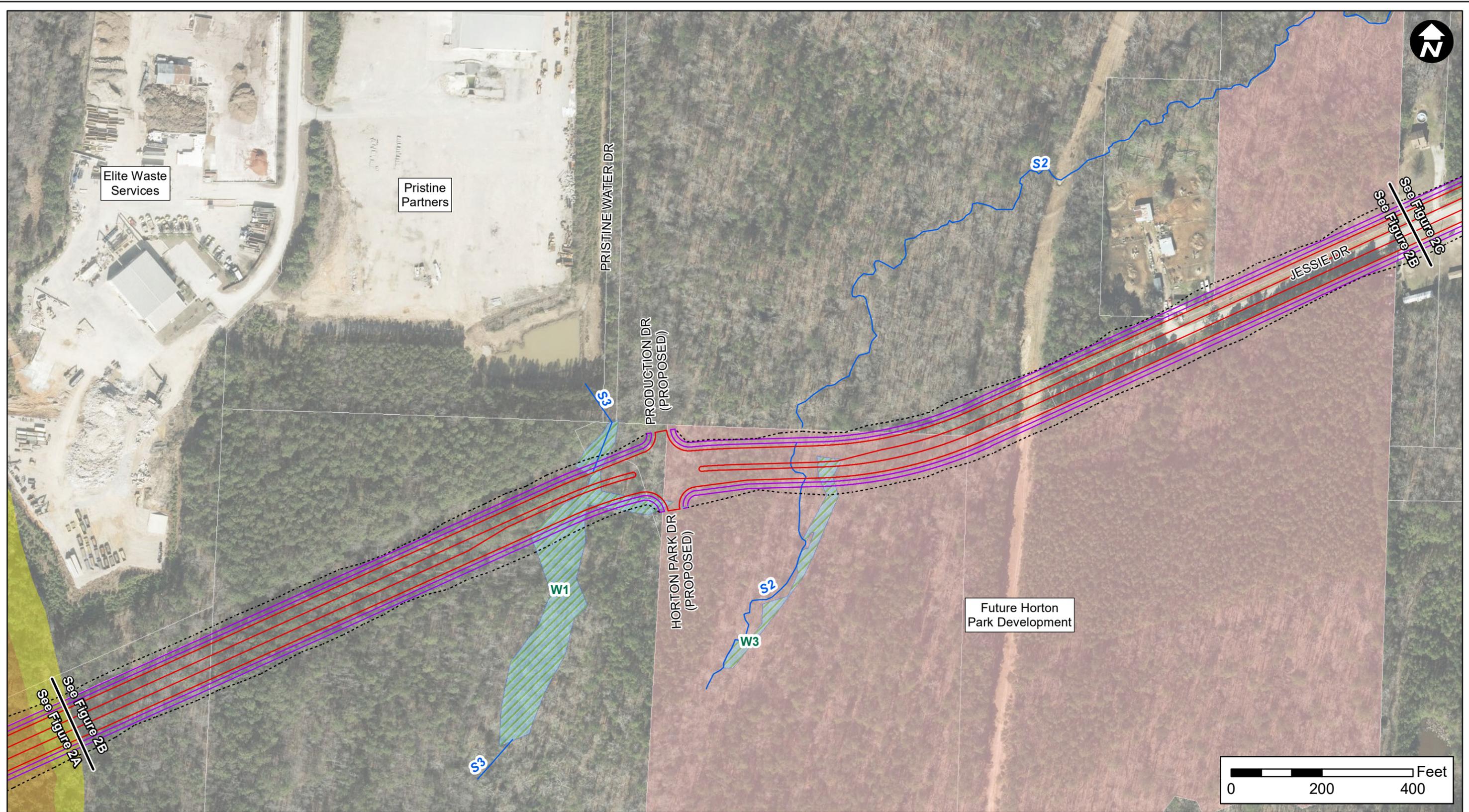
- | | | | |
|---------------------------|--|-------------------------|------------------------------------|
| Figure 2A-2D Extents | 500 Year Floodplain | Future Veridea | Proposed Sidewalk |
| Parcels | Knights Play Golf Center | Delineated Wetlands | Proposed Side Path |
| Brownfield Agreement Site | Future Horton Park Development | Delineated Streams | Proposed Slope Stakes |
| Floodway | Future Jessie Commons Development | Proposed Edge of Travel | Potential Hazardous Materials Site |
| 100 Year Floodplain | Future Cash Corporate Center Development | Proposed Arch Culvert | |

Figure 2:
Environmental Features Map
 Jessie Drive Improvements
 and Extension Project
 Town of Apex
 Wake County



- Proposed Edge of Travel
- Proposed Arch Culvert
- Proposed Sidewalk
- Proposed Side Path
- - - - Proposed Slope Stakes
- Delineated Streams
- ▨ Delineated Wetlands
- ▨ Future Jessie Commons Development
- ▨ Future Veridea
- ▨ Floodway
- ▨ 100 Year Floodplain
- ▨ 500 Year Floodplain
- ▨ Parcels
- Potential Hazardous Waste Site

Figure 2A:
Environmental Features Map
 Jessie Drive Improvements
 and Extension Project
 Town of Apex
 Wake County



- Proposed Edge of Travel
- Proposed Sidewalk
- Proposed Side Path
- - - - Proposed Slope Stakes
- Delineated Streams
- Delineated Wetlands
- Future Horton Park Development
- 100 Year Floodplain
- 500 Year Floodplain
- Parcels

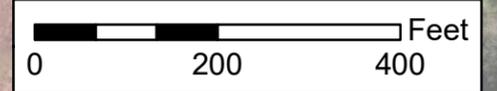


Figure 2B:
Environmental Features Map
 Jessie Drive Improvements
 and Extension Project
 Town of Apex
 Wake County



Knights Play
Golf Center



S2 S1

S2

See Figure 2B
See Figure 2C

JESSIE DR

HURDOVER RD

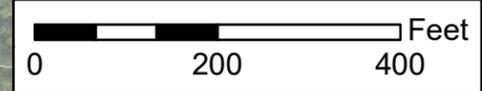
SUNSHINE
VALLEY LN

WRENNS NEST DR

SWEETGUM DR

TEN TEN RD

BRANDON
CREST DR



- Proposed Edge of Travel
- Proposed Side Path
- - - Proposed Slope Stakes
- Delineated Streams
- Knights Play Golf Center
- Future Horton Park Development
- Parcels

Figure 2C:
Environmental Features Map
Jessie Drive Improvements
and Extension Project
Town of Apex
Wake County



- | | | |
|-----------------------------|-------------------------------------|----------------------------------|
| — Proposed Edge of Travel | — Delineated Streams | ■ 100 Year Floodplain |
| — Proposed Arch Culvert | ▨ Delineated Wetlands | ■ 500 Year Floodplain |
| — Proposed Sidewalk | ■ Future Jessie Commons Development | □ Parcels |
| — Proposed Side Path | ■ Future Veridea | ● Potential Hazardous Waste Site |
| - - - Proposed Slope Stakes | ■ Floodway | |

Figure 2D:
Environmental Features Map
 Jessie Drive Improvements
 and Extension Project
 Town of Apex
 Wake County



Appendix A: Project Input Forms

NC Department of Transportation Community Studies Group, Human Environment Section
Local Emergency Responders Input Form for
JESSIE DRIVE IMPROVEMENTS AND EXTENSION PROJECT FEASIBILITY STUDY
COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Prepared by Jenna Shouse with input from: Chief John Letteney (Police), Chief Keith McGee (Fire), and Chief John Olson (Wake County EMS)

Date: August 21, 2018

Phone Number: (919) 372-7509

Title/Position:

Organization/Agency: Town of Apex

Completed Via: Email Phone

Email: Jenna.Shouse@apexnc.org

Interview Information/Instructions

If completed by phone:

Interviewed By (Name/Organization):

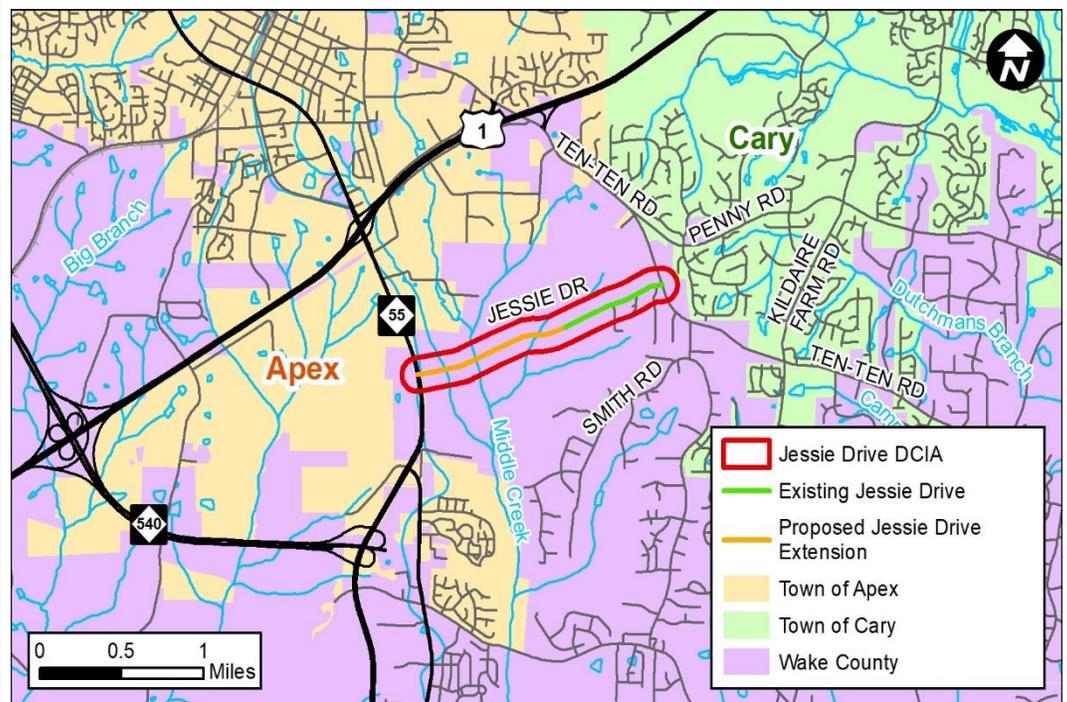
If completed by email:

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the **Save As** command) this file with a new file name for your records and e-mail the **new** file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the address or fax number below:

Russell Dalton, P.E.
Town of Apex, Transportation Engineer
73 Hunter Street
Apex, NC 27502

Project Information

The Town of Apex is conducting a Feasibility Study for the extension and improvements of Jessie Drive from NC 55 (E. Williams Street) to Ten Ten Road within Wake County. The project will analyze alternative alignments for the proposed extension of Jessie Drive and consider two-lane versus four-lane roadway construction. Improvements to the proposed NC 55 and Ten Ten Road intersections with Jessie Drive will also be considered during this study.



For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
<p>1. Are there any concerns related to emergency services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service).</p> <p><i>There are no concerns related to emergency services for this project.</i></p>	<input checked="" type="checkbox"/>
<p>2. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes travelers are likely to use to detour around the project area during construction, or the location of resources along these routes?</p> <p><i>Not applicable</i></p>	<input type="checkbox"/>
<p>3. Are there any future time periods or events that you know of where reduction in number of lanes for construction would be of particular concern?</p> <p><i>Not applicable</i></p>	<input type="checkbox"/>
<p>4. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year:</p> <p> <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact </p> <p><i>Not applicable</i></p>	
<p>5. Are road names referenced by the names locals would use?</p> <p><i>Yes</i></p>	<input checked="" type="checkbox"/>
<p>6. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)?</p> <p><i>No</i></p>	<input checked="" type="checkbox"/>
<p>7. Do you have any other concerns regarding the potential impact of this project on emergency services, or any additional comments? Please be as specific as possible.</p> <p><i>Overall</i></p> <ul style="list-style-type: none"> • <i>Annexed areas in the vicinity of the Jessie Drive Corridor, including Colvin Park (between Smith Road and Stephenson Road) and future Horton Park (south of Jessie Drive and west of Smith Road), receive emergency services from the Town but are difficult to access.</i> • <i>Jessie Drive will substantially improve connectivity to this area and therefore reduce response times, increase the level of emergency service to Apex customers, and improve health, safety, and wellbeing.</i> <p><i>Apex Police Department:</i></p> <ul style="list-style-type: none"> • <i>The Police Department does not respond to emergencies from a fixed location, rather the nearest officers will respond. The NC 55 corridor between US 1 and Technology Drive is a busy road segment for the Police Department and typically, the nearest officers to the Colvin Park/Horton Park area would be along this corridor. There is not a direct route from NC 55 to Colvin Park and future Horton Park subdivisions. The Police Department is receiving more calls in this area. Jessie Drive will improve response times.</i> • <i>An important petroleum resource to the region, the Dixie Pipeline, is located along NC 55 just north of future Jessie Drive. NC 55 has been shut down for incidents related to the pipeline in the past. Jessie Drive would provide an alternative route in these situations.</i> • <i>The Police Department prefers signalized and right-in/right-out intersections. Reducing left-turn movements reduces traffic incidents.</i> • <i>The Police Department requests four-way stops and direct access by residential driveways are avoided on Jessie Drive.</i> 	<input checked="" type="checkbox"/>

Apex Fire Department:

- *The Town is responsible for service to Colvin Park and future Horton Park and there is not a direct route to these subdivisions. The Jessie Drive project would likely cut response time in half. The Fire Department suggests using Network Analyst in GIS to compare travel times to Colvin Park or other area destination with and without Jessie Drive.*
- *Jessie Drive would allow increased service coverage area and expedite service – allowing Apex citizens in the vicinity to receive a more equitable level of service than they do today.*
- *The Fire Department requests that ingress and egress between Jessie Drive and NC 55 and Jessie Drive and Ten Ten Road are well planned for fuel tanker trucks.*

Wake County EMS:

- *Wake County is responsible for service in this area.*
- *Wake County EMS at Town of Cary Fire Station 6 (Kildaire Farm Road and Ten Ten Road) are the assigned first responders to this area.*
- *In the future, when the Jessie Drive project is complete, Wake County EMS at Town of Apex Fire Station 4 will respond to this area – reducing response times.*

NC Department of Transportation Community Studies Group, Human Environment Section

Local Planner Input Form for

JESSIE DRIVE COMMUNITY CHARACTERISTICS REPORT

Contact Information

Interviewee Name: Jenna Shouse

Date: March 26, 2019

Title/Position: Long Range Planner

Phone Number: 919-372-7509

Organization/Agency: Town of Apex

Email: jenna.shouse@apexnc.org

Completed Via: Email Phone

Check those questions that apply and provide a detailed explanation of your response in the field provided.

Check if item is applicable

Growth and Development

1.

The Town of Apex is quickly growing. Development proposals are available on our interactive map at the following URL:

<http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795>

There are several plans for development along and adjacent to this corridor. The current status of the following projects follows: Jessie Commons (preliminary layout plan submitted, interested in Jessie Drive project as a consideration of timing for moving forward), Elite Waste Services (under construction), Horton Park Pods 5-8 (site plan approved, construction plan under review), Stop N Go #5 (proposed), Colby Crossing (site plan approved), Middle Creek Regional Pump Station (approved).



A number of rezonings have been approved or are pending approval along and adjacent to this corridor. The current status of the following rezonings follows: 18CZ19 Cash Corporate Center (approved), 14CZ16 Aquiline PUD (approved), 17CZ19 MFW Investments, LLC PUD (approved), 16CZ32 Trinity Apex PUD (approved), and 18CZ04 Horton Park PUD Amendment (approved, conditions indicate phasing is dependent on extension of Jessie Drive), 18CZ30 Cozy Homes, LLC (approved), 09CZ07 Veridea (sustainable development plan approved), 06CZ26 Jessie Commons (PUD approved).

There are multiple funded roadway projects in the vicinity of this project including Ten Ten Road Widening (U-5825) and NC 540 Southeast Extension (R-2721). U-5981, US 1/NC 55 Interchange improvements is in the development program of the STIP.

2. Are there any adopted plans for growth or economic development that could directly affect or be affected by this project?

[Peak Plan 2030](#) is the Town's Comprehensive Plan. The plan identifies the following recommendations relevant to the study area:

"Identify new industrial/business/office park sites totaling 100-150 contiguous acres on NC-55, US-64, US-1, and Jessie Drive to accommodate non-retail employment growth. These corridors capitalize on access to NC-540."

"Preserve access and visibility for large parcels that could be developed as employment centers or mixed-use communities on key transportation corridors such as US-64, NC-55, South Salem Street, and Jessie Drive."

The Town recently adopted [Advance Apex: The 2045 Land Use Map Update](#) and the [2045 Land Use Map](#). Changes to the land use map in the project vicinity include: the designation of Knight's Play as Park-Public or Private, increased residential densities and mixed use



<p><i>opportunities near the future high school planned south of Jessie Drive, and mixed use opportunities at the southwest corner of the intersection of Jessie Drive and Ten Ten Road.</i></p>	
<p>3. Are there plans to extend water/sewer lines or to build any new facilities, such as fire stations, schools, or other facilities, in the vicinity of the project?</p> <p><i>The approved Horton Park PUD will extend water from Jessie Drive, the Pemberley subdivision, and Smith Road. The PUD will also build the Middle Creek North Pump Station to provide sanitary sewer service to the Middle Creek Drainage basin north of Colby Chase Drive. A new high school is planned south of Jessie Drive (closer to Sunset Lake Road) with the main point of access likely from the east via Stephenson Road. Plans for Horton Park Pods 5-8 include construction of a Horton Park Drive, a collector street that will intersect with Jessie Drive near the midpoint between NC 55 and Ten Ten Road. A pre-application meeting for the Jessie Drive project is scheduled for April 4, 2019. Additional information from Water Resources and other departments may be provided at that time.</i></p>	<input checked="" type="checkbox"/>
<p>4. Are there any specific business and/or economic resources present in the project area, such as business parks, distribution centers, manufacturing facilities, etc.?</p> <p><i>Pinnacle Park, an existing business park, is located north of future Jessie Drive, between Ten Ten Road and NC 55. Wake Tech Community College - Western Wake Campus, is located to the southeast of the project corridor off Kildaire Farm Road.</i></p> <p><i>An important petroleum resource to the region, the Dixie Pipeline, is located along NC 55 just north of future Jessie Drive. NC 55 has been shut down for incidents related to the pipeline in the past. Jessie Drive would provide an alternative route in these situations.</i></p> <p><i>A Motiva fuel terminal is located on Ten Ten Road north of existing Jessie Drive and would likely use Jessie Drive extension to access NC 55 and the US 1 interchange. Currently fuel trucks turn left on Ten Ten Road to reach US 1. There are other light industrial businesses along the Ten Ten corridor including Atlantic Mulch, Tractor Tracs and Mastec.</i></p> <p><i>The plans associated with Horton Park and the Cash Corporate Center are anticipated to further enhance the economic resources in this area.</i></p>	<input checked="" type="checkbox"/>
<p>Special Populations</p>	
<p>5. Are you aware of any minority, low-income or limited English proficiency (LEP) populations/communities in the vicinity of the project? If so, please provide the locations of these populations in the area. <i>[If yes, proceed to Question 6. If no, skip to Question 7.]</i></p> <p><i>The project is located in an area of transition where there is a mix of affluent populations and low income populations, both in the vicinity of Ten Ten Road and NC 55.</i></p> <p><i>Near NC 55, along Bobbitt Road, south of the project vicinity, there is a presence of low-income and minority populations. Many of these residents are frequently observed walking along NC 55.</i></p> <p><i>There are older, rural homes with minority residents both along Ten Ten Road and south of the project along Smith Road. Based on observation, the minority walkers/bikers seen on Ten Ten Road appear to be traveling to and from work.</i></p> <p><i>This project is located in Census Tract 534.20. In 2017, 44.5% of residents in this Census Tract reported themselves as any race other than white, non-Hispanic; 6.9% of the population reported being 65 years or older; 5.8% of the population reported living under the poverty threshold; and 3.1% of households reported having Limited English Proficiency.¹ This Census Tract has the highest percentage of LEP and minority populations in the Town of Apex.</i></p>	<input checked="" type="checkbox"/>

¹ US Census Bureau American Community Survey, 2017.

<p>6. Are there specific community resources or services that are used by minority, low-income or LEP populations in the vicinity of the project? How is the project likely to affect minority and low-income populations?</p> <p><i>Restaurants and services along NC 55 are frequently used by minority, low-income, and LEP populations in the vicinity of the project. Existing apartments and affordable houses may be occupied by zero-car households. Accommodating bicycle and pedestrian traffic will be important.</i></p> <p><i>Wake Tech Community College - Western Wake Campus and Goodwill are located near this project along Kildaire Farm Road in Cary. A number of churches are located in the project vicinity along NC 55 and Ten Ten Road. See question 8 for a list of churches in the area.</i></p>	<input checked="" type="checkbox"/>
<p>7. Are there any tribal groups connected with land, religious, ethnic or other special populations with different mobility needs or outreach needs in the project area?</p> <p><i>None known</i></p>	
<p>8. Who should we contact to discuss outreach needs for any special populations? Please provide input on community leader contacts, media sources or other ways to reach these populations.</p> <p><i>There are several churches in the area that may assist with outreach to special populations including: New Life Community Church, Hope Community Church, The Point Church, Grace Church, Felton Grove Missionary Baptist Church, and Resurrection Life Church.</i></p> <p><i>It would also be beneficial to reach out to the Town of Cary as this project is adjacent to the Cary Corporate Limits.</i></p>	<input checked="" type="checkbox"/>
Access, Accessibility, and Mobility	
<p>9. Is there pedestrian or bicycle activity/traffic or transit use along the project? If so, please describe multimodal activity in the project area.</p> <p><i>See previous forms and responses. Individuals are frequently observed walking along NC 55 and Ten Ten Road adjacent to this corridor.</i></p> <p><i>There is no existing transit service along Ten Ten Road, but Ten Ten Road and future Jessie Drive have been identified as potential future transit routes in the Town's long range transportation plan.</i></p> <p><i>Ten Ten Road is a designated bicycle route. Bicycle and pedestrian improvements are planned as part of U-5825.</i></p> <p><i>Middle Creek Greenway will be built in phases, through both public and private development projects. Middle Creek Greenway will cross Jessie Drive.</i></p> <p><i>Future Jessie Drive has been identified as a Strategic Freight Corridor in regional and local plans.</i></p>	<input checked="" type="checkbox"/>
<p>10. Are there any existing access, accessibility, or mobility concerns or any barriers to non-auto travel in the area? Please consider all modes.</p> <p><i>There are currently no bicycle or pedestrian facilities along existing Jessie Drive. The project should address both movement along the corridor and locations for bicycle and pedestrians to cross the corridor. Bicycle and pedestrian crossing facilities should be provided where Jessie Drive intersects Ten Ten Road and NC 55. Bicycle and pedestrian crossings should be considered at the future intersection of Jessie Drive and Production Drive, where the Middle Creek Greenway is planned to cross Jessie Drive. There is no existing transit service along Jessie Drive or adjacent streets. Local plans recommend transit service along future Jessie Drive.</i></p>	<input checked="" type="checkbox"/>

<p>Concerns related to emergency access are described in the input form completed for emergency responders.</p>	
<p>11. Are there any adopted plans for pedestrian, greenway, bicycle, or transit facilities in the area? For each plan, please provide a description of how the plan applies to the project area, the title of the plan, its year of adoption, and the current status of its implementation.</p> <p>Advance Apex (2019), the Town’s transportation plan includes local bus routes along Jessie Drive, Ten Ten Road, and NC 55. Wake Transit Plans include a new route, HSX Holly Springs-Apex-Cary Express, which will provide service along NC 55, adjacent to this corridor. GoCary will operate this service and it is anticipated to begin operations January 2020.</p> <p>Bike Apex (2019), the Town’s bicycle plan, recommends side path along both sides of Jessie Drive from Ten Ten Road to Veridea Parkway. Bicycle recommends adjacent to this corridor include side path along Reliance Avenue/Production Drive extension, side path along both sides of NC 55, and bike lanes along Ten Ten Road. Middle Creek Greenway is planned to extend from Holly Springs to Lufkin Road Middle School. The greenway will likely cross over Jessie Drive where it intersects Production Drive at a signalized intersection. The planned greenway is west of a future high school.</p> <p>Developments are required to provide sidewalk along both sides of all collector streets and thoroughfares and along one side of all residential streets.</p> <p>Maps depicting existing and planned bicycle, pedestrian and transit facilities are shown on the following maps: Bicycle, Pedestrian, and Equestrian Plan; Parks, Recreation, Greenways, and Open Space Master Plan; Transit Plan.</p>	<input checked="" type="checkbox"/>
<p>Agricultural Operations</p>	
<p>12. Are you aware of any active agricultural operations in the vicinity of the project? If so, please describe these operations (e.g. size, ownership, crops, years farmed, suppliers, customers, value to the community). [If yes, answer Question 12. If no, skip to Question 13.]</p> <p>None known</p>	<input type="checkbox"/>
<p>13. Are farm support services—such as farm suppliers, equipment dealers, processing and storage facilities, and farmer’s markets—located in the vicinity of the project? If so, please describe these services (e.g. type, location).</p> <p>None known</p>	<input type="checkbox"/>
<p>14. Does the project lie within a VAD or EVAD district, or are you aware of any land with other farmland protections (plans, tax districts or credits, trust, agricultural zoning, deed restrictions)? If so, please describe the nature and location of these areas and properties.</p> <p>No</p>	<input type="checkbox"/>
<p>Other Notable Features</p>	
<p>15. Are there any recreational properties within the project area that were purchased or improved with Land and Water Conservation Act funds?</p> <p>None known</p>	<input type="checkbox"/>
<p>16. Are there any other specific notable community resources or issues in the project area? (e.g. socio-economic resources, recreational resources, community safety concerns, cohesive neighborhoods, areas in decline) If so, please describe.</p> <p>Apex Fire Department Station 4 is located on NC 55, north of the project corridor. Knight’s Play Golf Course is a privately-owned recreational resource. This site has been identified on the Town’s 2045 Land Use Map as Park – Public or Private.</p>	<input checked="" type="checkbox"/>
<p>Detours and Closures</p>	

<p>17. Are there any future time periods or events that you know of where road or bridge closure or reduction in number of lanes for construction would be of particular concern? <i>Not applicable.</i></p>	<input type="checkbox"/>
<p>18. <i>[If applicable]</i> Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? <i>Not applicable.</i></p>	<input type="checkbox"/>
<p>19. Rate the overall impact on local planning objectives if the bridge or roadway were closed or at reduced capacity for up to a year: <input type="checkbox"/> Positive Impact <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact <i>Not applicable</i></p>	
<p><i>Closing Questions</i></p>	
<p>20. Are road names referenced by the names locals would use? <i>Yes</i></p>	<input checked="" type="checkbox"/>
<p>21. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? <i>Town of Cary should be contacted regarding this project.</i></p>	<input checked="" type="checkbox"/>
<p>22. Do you have any additional comments about this project? <i>Thank you for the opportunity to provide comments on this important project. Please continue to keep the Town informed and let us know how we can help with the studies and work going forward.</i></p>	<input checked="" type="checkbox"/>

NC Department of Transportation Community Studies Group, Human Environment Section
Local Schools Input Form for

**JESSIE DRIVE IMPROVEMENTS AND EXTENSION PROJECT FEASIBILITY STUDY
COMMUNITY CHARACTERISTICS REPORT**

Contact Information

Interviewee Name: Stephen Sposato
Title/Position: Senior Administrator, Transportation
Organization/Agency: Wake County Schools
Email: ssposato2@wcpss.net

Date: August 16, 2018
Phone Number: (919) 533-7837
Completed Via: Email Phone

Interview Information/Instructions

If completed by phone:

Interviewed By (Name/Organization): Shannon Cox, Town of Apex

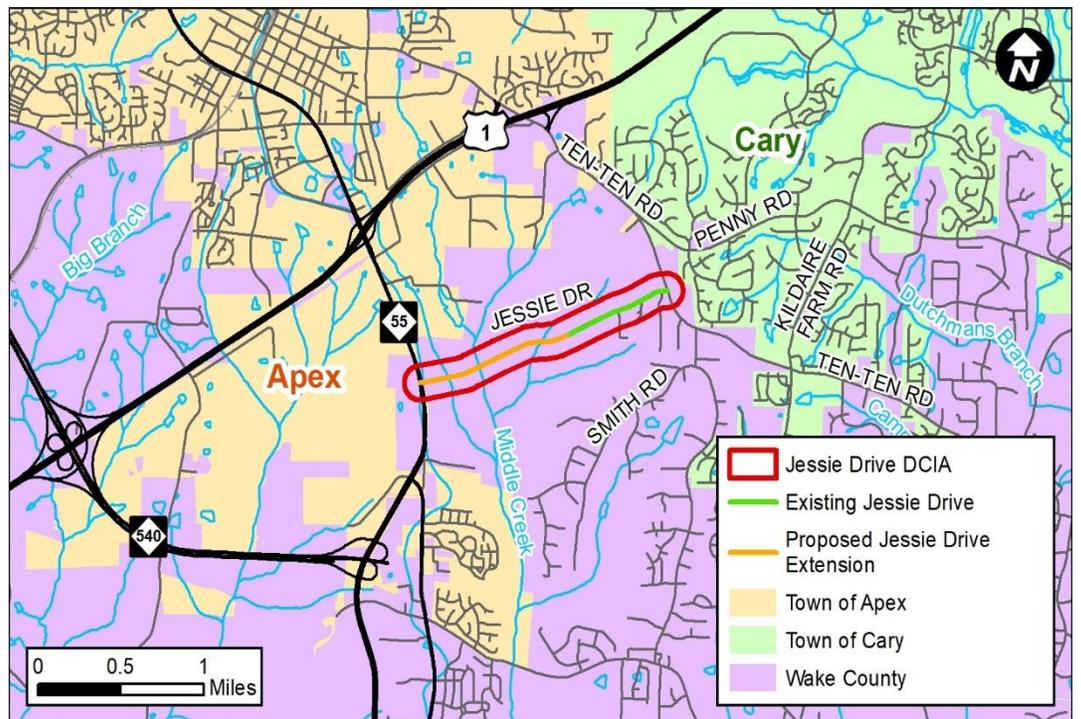
If completed by email:

Using the project information and map below, please respond to the following questions by typing your answers in the space provided. Then save (using the **Save As** command) this file with a new file name for your records and e-mail the **new** file back to the original sender. If you would prefer to complete a hard copy of this form, please send all sheets to the following address or fax number:

Russel Dalton, P.E.
Town of Apex, Transportation Engineer
73 Hunter Street
Apex, NC 27502

Project Information

The Town of Apex is conducting a Feasibility Study for the extension and improvements of Jessie Drive from NC 55 (E. Williams Street) to Ten Ten Road within Wake County. The project will analyze alternative alignments for the proposed extension of Jessie Drive and consider two-lane versus four-lane roadway construction. Improvements to the proposed NC 55 and Ten Ten Road intersections with Jessie Drive will also be considered during this study.



Check all questions that apply and provide a detailed explanation of your response in the field provided.	Check if item is applicable
<p>1. How many school buses pass through the corridor per day (total # of daily buses, total # daily of trips)?</p> <p><i>Since this is a future road there are no existing bus trips. Jessie Drive will serve as an alternative route to NC 55 and relieve the congestion on NC 55, Ten Ten Road and Lufkin Road. A new high school is planned south of Jessie Drive with the main point of access likely from the east via Stephenson Road. Jessie Drive will definitely be more important in the future to distribute trips and allow for alternative ways to get to area schools as this area changes.</i></p>	<input type="checkbox"/>
<p>2. Is the corridor used by carpool traffic or pedestrians to access local schools? If yes, please describe the location and time(s) of day.</p> <p><i>Since this is a future road there are no existing carpool or pedestrian trips. Middle Creek Greenway is planned to extend from Holly Springs to Lufkin Road Middle School. It will be important to consider how greenway users cross Jessie Drive. The greenway will likely cross over Jessie Drive where it intersects Production Drive at a signalized intersection. A signalized crossing would be favorable. The planned greenway is west of the future high school. Sidepaths and/or sidewalks may be needed to connect the greenway to the future high school along roadways.</i></p>	<input type="checkbox"/>
<p>3. [Applicable if schools are located in or near the project area] Are there any Safe Routes to School plans in place at schools in the vicinity of the project?</p> <p><i>Not applicable</i></p>	<input type="checkbox"/>
<p>4. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes or the location of resources along these routes with respect to school traffic?</p> <p><i>Not applicable</i></p>	<input type="checkbox"/>
<p>5. Are there any future time periods or events that you know of where reduction in number of lanes for construction would be of particular concern?</p> <p><i>Not applicable</i></p>	<input type="checkbox"/>
<p>6. Rate the overall impact on school transportation if the roadway were at reduced capacity for up to a year:</p> <p> <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact </p> <p><i>Not applicable</i></p>	
<p>7. Are road names referenced by the names locals would use?</p> <p><i>Yes</i></p>	<input checked="" type="checkbox"/>
<p>8. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)?</p> <p><i>Town of Apex</i></p>	<input checked="" type="checkbox"/>
<p>9. Are there any other concerns you have regarding the potential impact of this project on school transportation services or any additional comments? Please be as specific as possible.</p> <p><i>The Jessie Drive project will have a positive impact on school transportation and will help to mitigate future congestion on Ten Ten Road and NC 55. WCPSS is in favor of streets that provide connectivity. The only potential issue is during construction when Jessie Drive ties into NC 55. It is anticipated that this will be considered further during design.</i></p>	<input checked="" type="checkbox"/>



Appendix B: Public Comment Summary and Responses

**Jessie Drive Improvements and Extension Project
Apex, Wake County, NC**

**Public Meeting - May 16, 2019
Comment Summary and Responses
May 31, 2019**

A public meeting was held on May 16, 2019 at the Apex Town Hall in Apex, NC. Approximately 15 members of the public attended the public meeting. Paper comment forms were available at the public meeting. A link to complete the comment form online was provided as well. During the 2-week comment period, a total of 15 survey respondents answered at least one question on the online survey, and one person submitted the paper survey. Responses to comments and concerns presented by the public are shown below the corresponding public input in *italics*.

The survey posed seven multiple choice questions regarding the project and how the public received the proposed design. Some questions allowed more than one answer. Each of the response options, and corresponding distribution of responses received, are shown in Figures 1-10. Space for additional comments was also available for each question. Following the project specific questions, four demographic questions were included in the survey. These questions were also multiple choice allowing only one response, except for the question asking respondents which race/ethnicity they identified with.

Table of Contents

Question 1: How would the project affect you?	2
Question 2: What do you think about the proposed design?	3
Question 3: How do you think this project will affect traffic and development?	4
Question 4: What priority would you assign to this project, considering all the transportation needs in Apex?.....	5
Question 5: Do you live near the project?.....	6
Question 6: How do you anticipate traveling along the proposed corridor?	7
Question 7: Are you generally in favor of the project, understanding there may be changes following the open house public meeting?.....	8
Other Comments	9
Demographic Data: What is your race or ethnicity?.....	11
Demographic Data: How many people live in your household, including you?	12
Demographic Data: What is your annual household income?	13

Question 1: How would the project affect you?

The majority (53%) of respondents indicated that the project would affect them very positively, while 35% said the project would affect them very negatively. The minority (12%) said that the project would not affect them.

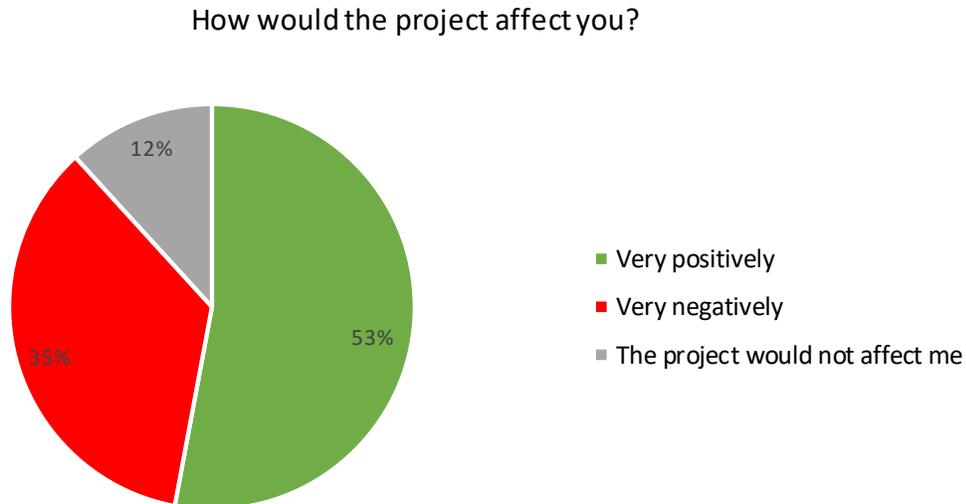


Figure 1. Distribution of responses to Question 1

Six respondents provided additional comments, which are summarized below.

- Emergency vehicles, school buses, and other large vehicles would be delayed or impeded with the U-turn (x2)
 - *Response: A median with controlled breaks is not expected to adversely impact typical emergency response times. Emergency response and other large vehicles could come from NC 55 or Ten Ten Road (SR 1010), so U-turns would not always be necessary. The new connectivity to NC 55 from Jessie Drive may improve emergency response time.*
- Access in and out of Sweetgum Drive will be difficult (x5)
 - *Response: Left-in and left-out access at Sweetgum Drive is not proposed to be allowed due to current design standards, which requires 1,200 feet between full movement intersections to allow for proper sight distance, acceleration/deceleration, and vehicle queues. The project team will investigate the feasibility of providing a U-turn crossover at Wrenns Nest Drive to reduce the distance between Sweetgum Drive and the nearest U-turn bulb.*
- Not in favor of bringing the road close to our home on the corner of Sweetgum Drive and Jessie Drive (x2)
 - *Response: Property impacts will be minimized where feasible as design is finalized. Another open house public meeting will occur prior to finalizing the design. Once the final design has been determined, a Right-of-Way Agent will meet with each affected property owner to explain the plans, advise them as to how the project will affect them, and inform them of their rights as a property owner. The Right-of-Way Agent will also explain the appraisal and offer process.*
- Would reduce work commute

Question 2: What do you think about the proposed design?

The largest proportion (47%) of respondents indicated that the proposed design is very good, 29% said the design is not good, and 12% indicated that the design could use some work.

What do you think about the proposed design?

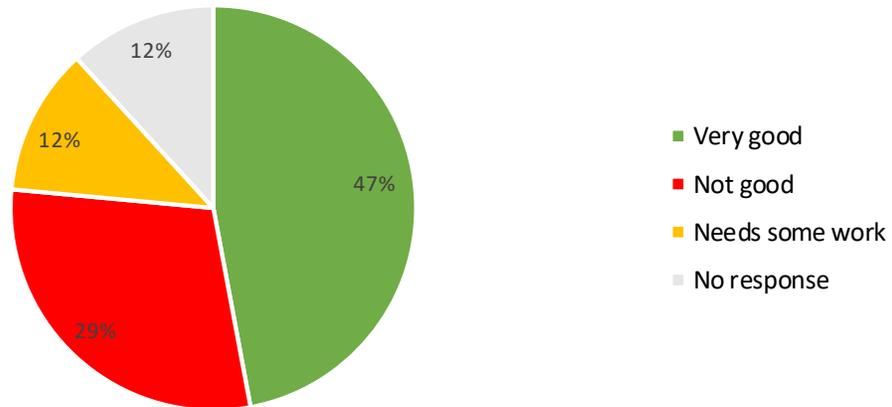


Figure 2. Distribution of responses to Question 2

One respondent provided the following additional comment.

- A lot of cars will have to do a U-turn on Ten Ten Road (SR 1010) to get to NC 55
 - *Response: Town staff can explore adding local connecting streets between existing streets and parcels to minimize and avoid U-turns, but it would require more neighborhood coordination and additional property. Town staff would welcome any suggestions on alternative routes that could be added to the Transportation Plan.*

Question 3: How do you think this project will affect traffic and development?

An equal portion of respondents indicated that they think the project will attract new traffic (36%) and attract new development (36%). A total of 18% of the respondents said they think the project will reduce traffic on existing roads.

How do you think this project will affect traffic and development? You may choose more than one answer.

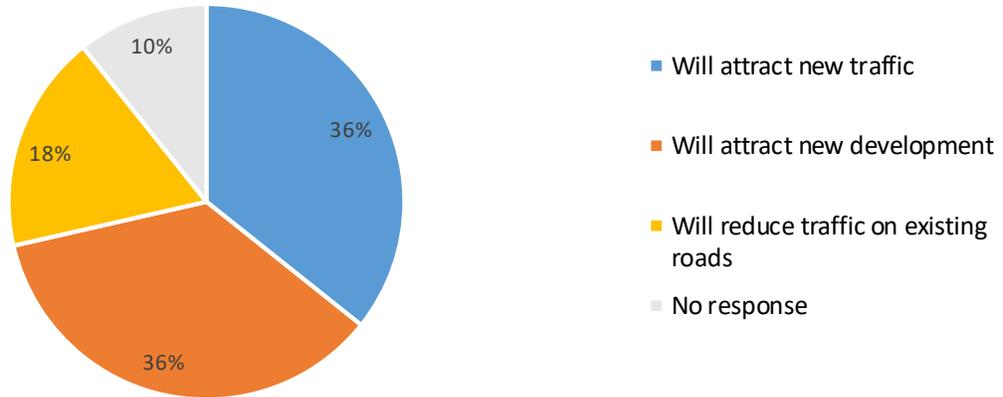


Figure 3. Distribution of responses to Question 3

Five respondents provided additional comments, which are summarized below.

- Not in favor of the project (x3)
- Would ruin the rural feel of the neighborhood
- Would increase traffic which would decrease safety
- More vehicles will make this a short cut to get to Ten Ten Road
- Need this project to handle the traffic from new developments
- Will greatly improve emergency response times

Question 4: What priority would you assign to this project, considering all the transportation needs in Apex?

This project is high priority for 41% of respondents, medium priority for 24% of respondents, and low priority for 23% of respondents.

What priority would you assign to this project, considering all the transportation needs in Apex?

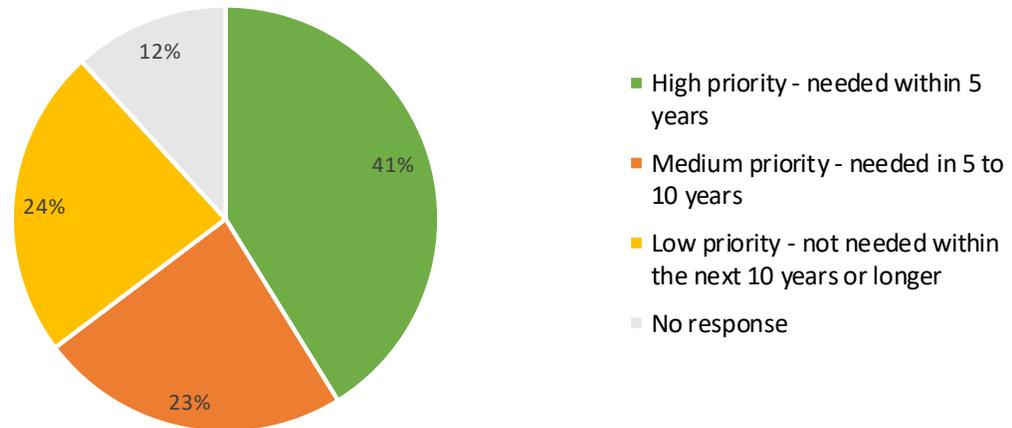


Figure 4. Distribution of responses to Question 4

Three respondents provided additional comments, which are summarized below.

- Expansion of Ten Ten Road should ease up traffic in this area, so the extension of Jessie Drive is not needed at this time
 - *Response: The expansion of Ten Ten Road is expected to reduce congestion in the area, particularly for north-south traffic; however, the purpose of the Jessie Drive extension is to improve east-west connectivity and provide access to new and proposed developments in the area.*
- Wait for awhile
- Not needed at all
- NC 540 has not taken enough traffic off NC 55 and US 1

Question 5: Do you live near the project?

The largest proportion of respondents (35%) indicated that they live in a nearby neighborhood. A total of 29% of survey respondents indicated that they live in a house or neighborhood connected to Jessie Drive and 24% indicated that they do not live very close.

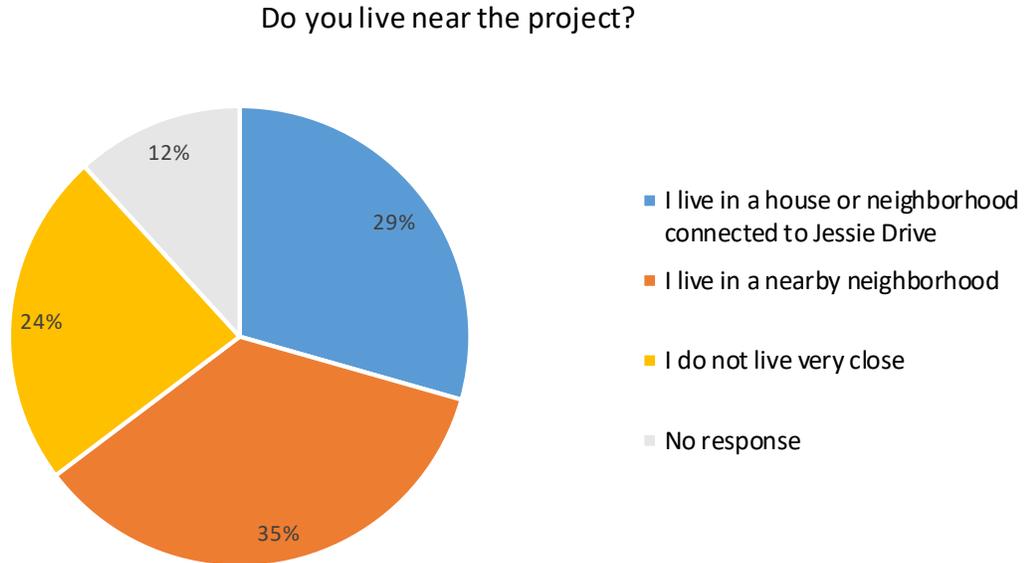


Figure 5. Distribution of responses to Question 5

Two respondents provided additional comments, which are summarized below.

- Will negatively affect our lifestyle and quiet neighborhood
- Feel that Town of Apex representatives do not like Sweetgum Drive
- I work in a nearby neighborhood
- Would like Lufkin Road to stay open
 - *Lufkin Road is outside of project study area and will not be affected by this project.*

Question 6: How do you anticipate traveling along the proposed corridor?

The majority (67%) of respondents indicated that they anticipate traveling along the proposed corridor by vehicle. A total of 11% of respondents do not plan to travel along the corridor, 5% anticipate walking along the corridor, and none anticipate traveling by bike along the corridor.

How do you anticipate traveling along the proposed corridor? You may choose more than one answer.

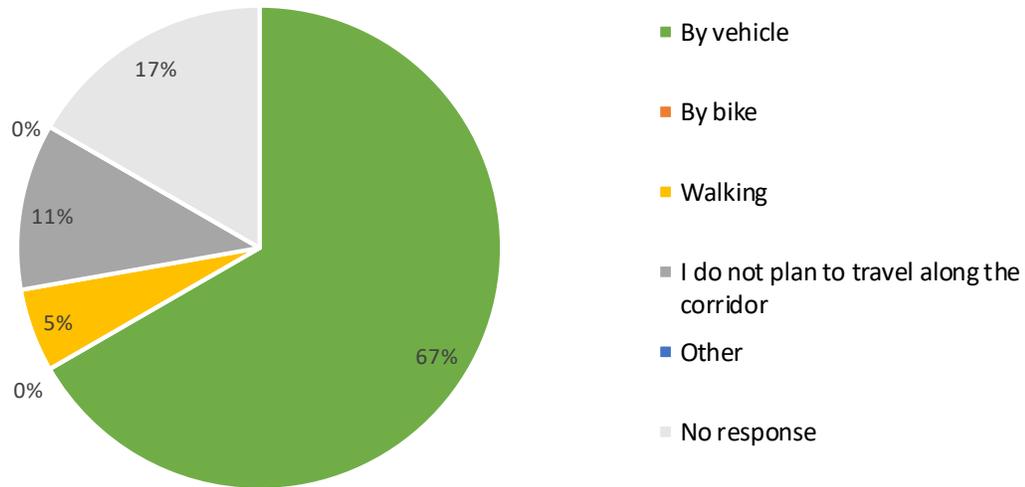


Figure 6. Distribution of responses to Question 6

Four respondents provided additional comments, which are summarized below.

- I will not walk or bike on the proposed multi-use path with the increase of vehicles
- Concern about noise and air pollution
 - *Response: A traffic noise study will be performed to determine if noise abatement is appropriate as part of this project. In addition, federal air quality guidelines will be followed.*
- Concern about doing a U-turn to get onto NC 55
- I will travel the corridor to/from work (x2)

Question 7: Are you generally in favor of the project, understanding there may be changes following the open house public meeting?

The largest proportion of respondents (47%) indicated that they are in favor of the project, while 23% said they are not in favor of the project and 12% noted that they might be in favor of the project, pending further changes and more information.

Are you generally in favor of the project, understanding there may be changes following the open house public meeting and survey?

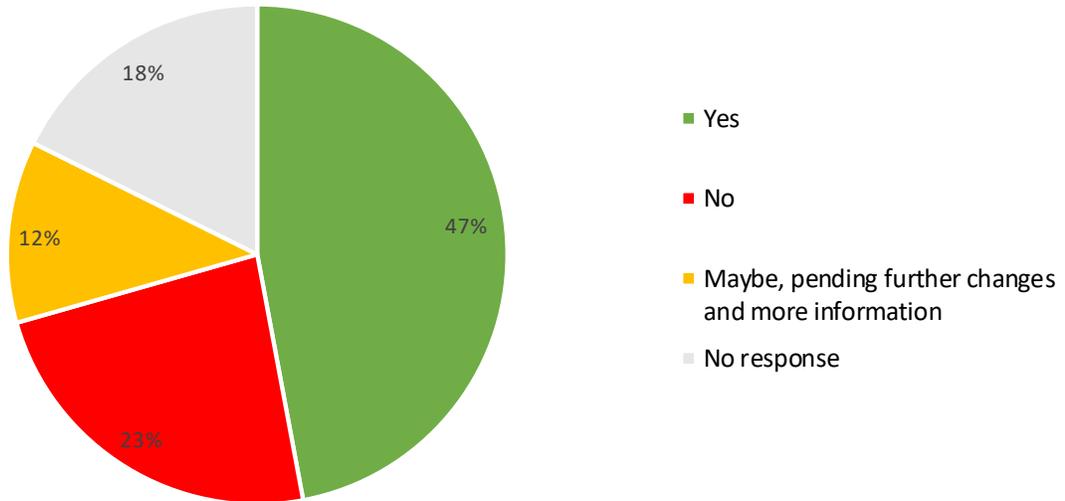


Figure 7. Distribution of responses to Question 7

Two respondents provided the following additional comments.

- Not in favor of the project due to property impacts to residences along the corridor (x2)

Other Comments

Space was provided on the comment form for additional comments not covered by the previous questions. Some members of the public also submitted comments via email.

- Hope future Ten Ten Road plan meets growth of Jessie Drive
 - *Response: Traffic projections through year 2040, including the Ten Ten Road project, have been considered as part of this project.*
- Concern that the extension will become a cut-through for NC 55 traffic to get to Ten Ten Road which would increase congestion.
 - *Response: This major thoroughfare will provide an alternative route for commuters and trucks. Giving drivers options is one way to address congestion and promote resiliency in a growing area as well as providing new and improved emergency service response routes.*
- Stop light at Smith Road and Ten Ten Road does not allow enough time to turn right from Summercrest Drive. Request to adjust timing to allow ample time for people to turn out of their street.
 - *Response: NCDOT manages the traffic signals and sets timing in Apex. If you would like to request timing changes, please provide specific feedback online: <https://www.ncdot.gov/contact/Pages/default.aspx>.*
- Is the housing development access road still planned?
 - *Response: Horton Park includes a north-south road named Horton Park Drive connecting to Jessie Drive. It also includes a planned eastward connection to Smith Road south of the intersection at Stephenson Road. In addition, there will be a connection from Horton Park Drive to Colby Chase Drive. This connection will be completed in another small development that is not part of Horton Park, but planned by the same developer.*
- Why is Jessie Drive not being widened now to accommodate development traffic?
 - *Response: Traffic projections show that four lanes are not needed immediately and could be built instead as developments are proposed. However, the ultimate design (4 lanes) would be built with the connection of Jessie Drive to Ten Ten Road.*
- Ten Ten Road widening should happen before any further housing developments that would add traffic to Ten Ten Road be allowed to be built. Please review recent Ten Ten Road car counts.
 - *Response: The Ten Ten Road widening is anticipated to begin construction in the year 2023. The Town may have legal authority to limit development or add/request zoning conditions in some but not all cases. That would be subject to Town Council approval/denial in each case. Ten Ten Road is used by regional travelers as an access to US 1. As a regional connector, traffic could also increase due to development outside of the Town of Apex planning jurisdiction.*
- If this extension is built to have a cut through from Ten Ten Road to NC 55, please add a stop sign or speed bumps to deter traffic from using Jessie Drive as a cut through and speeding down a straight road.
 - *Response: This is a major thoroughfare route, so traffic calming is not an option, nor is it recommended.*
- Commuters from Holly Springs and Fuquay-Varina will love having another stop light on NC 55.
 - *Response: The Capital Area Metropolitan Planning Organization (CAMPO) is currently studying a long-term vision on NC 55, which may be for a six-lane Superstreet that may eventually include a bridge with square loop ramps at the NC 55/Jessie Drive*

intersection. (See the CAMPO Southwest Area Study for more information: <http://www.campo-nc.us/programs-studies/area-studies>)

- Concerned proposed median will restrict access and create delay for public and private services that have large vehicles, including EMS, Wake Coordinated Transportation Service, school buses and septic tank maintenance, onto Sweetgum Drive and Wrenn's Nest Drive (x3)
 - *Response: Access for service and larger vehicles is expected to be improved by allowing access from both Ten Ten Road and NC 55. With the additional access, a median with controlled breaks is not expected to adversely impact travel times and U-turns would not always be necessary. A median with controlled breaks is not expected to adversely impact typical emergency response times and may improve response with connectivity being provided to NC 55.*
Left-in and left-out access at Sweetgum Drive is not proposed to be allowed due to current design standards, which requires 1,200 feet between full movement intersections to allow for proper sight distance, acceleration/deceleration, and vehicle queues. The project team will investigate the feasibility of providing a U-turn crossover at Wrenns Nest Drive to reduce the distance between Sweetgum Drive and the nearest U-turn bulb. Town staff can also explore adding local connecting streets between existing streets and parcels to minimize and avoid U-turns, but it would require more neighborhood coordination and additional property. Town staff would welcome any suggestions on alternative routes that could be added to the Transportation Plan.
- In favor of stoplight at Jessie Drive and Ten Ten Road
- Suggest traffic circle at Hurdover Road
 - *Response: A traffic circle at Hurdover Road is not recommended because traffic volumes only warrant a stop-controlled intersection.*
- Concern about increased safety hazards due to increased speed, vehicle volume, and U-turns
- Concern that Hurdover Road will see increased vehicle volume as an alternative to making U-turns.
- Concern about higher noise and air emissions levels
 - *Response: A traffic noise study will be performed to determine if noise abatement is appropriate as part of this project. In addition, federal air quality guidelines will be followed.*

Demographic Data: What is your race or ethnicity?

All respondents identified as white/Caucasian for their race or ethnicity. No survey respondents identified as Black/African-American, Hispanic or Latino, Asian American, American Indian or Alaskan Native, or Native Hawaiian or other Pacific Islander.

What is your race or ethnicity? You may choose more than one answer. Be sure to click "confirm selection" when finished.

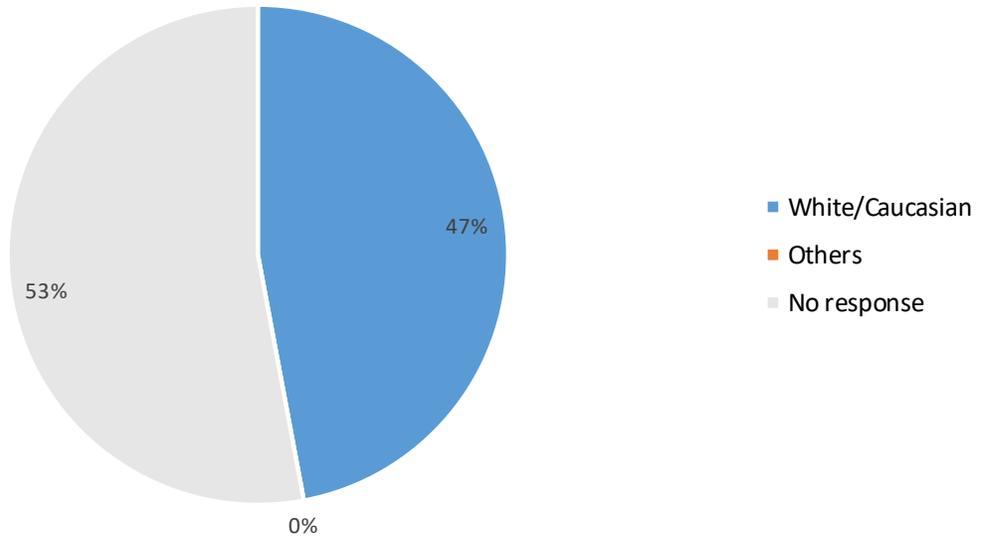


Figure 8. Distribution of race or ethnicity identified by respondents

Demographic Data: How many people live in your household, including you?

The largest proportion of respondents reported four (23%) or two (24%) people living in their household. A total of 18% reported a three-person household, and 6% reported a five-person household. No respondents identified having six, seven, eight, or more than eight people living in their household.

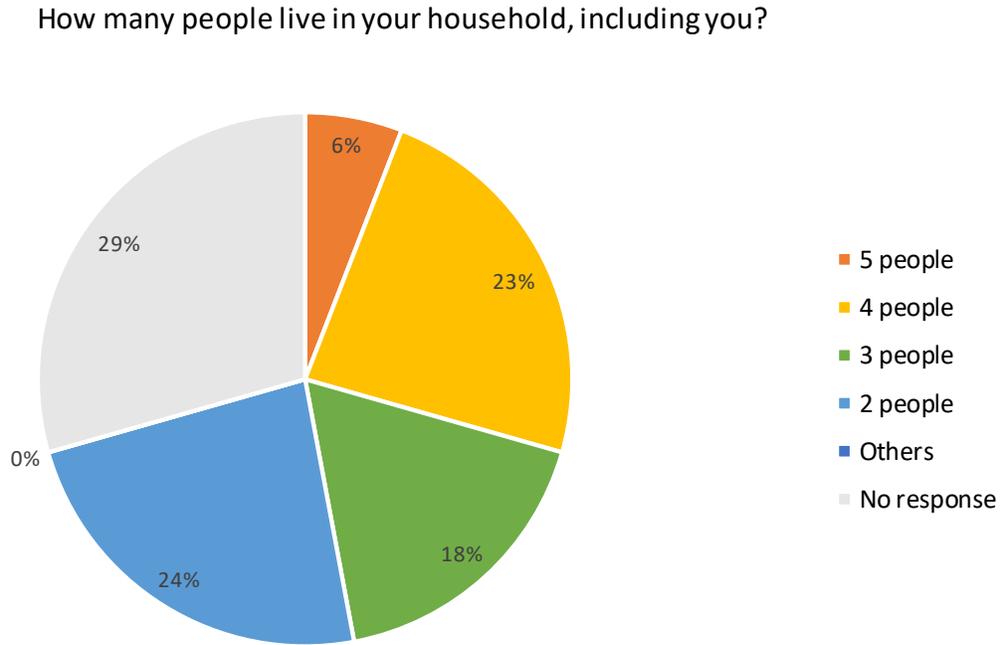


Figure 9. Distribution of household size reported by survey respondents

Demographic Data: What is your annual household income?

The majority of respondents reported earning more than \$60,000 as an annual household income. A total of 6% of respondents reported an annual income between \$40,000 and \$50,000. No respondents indicated an annual income of less than \$40,000.

What is your annual household income?

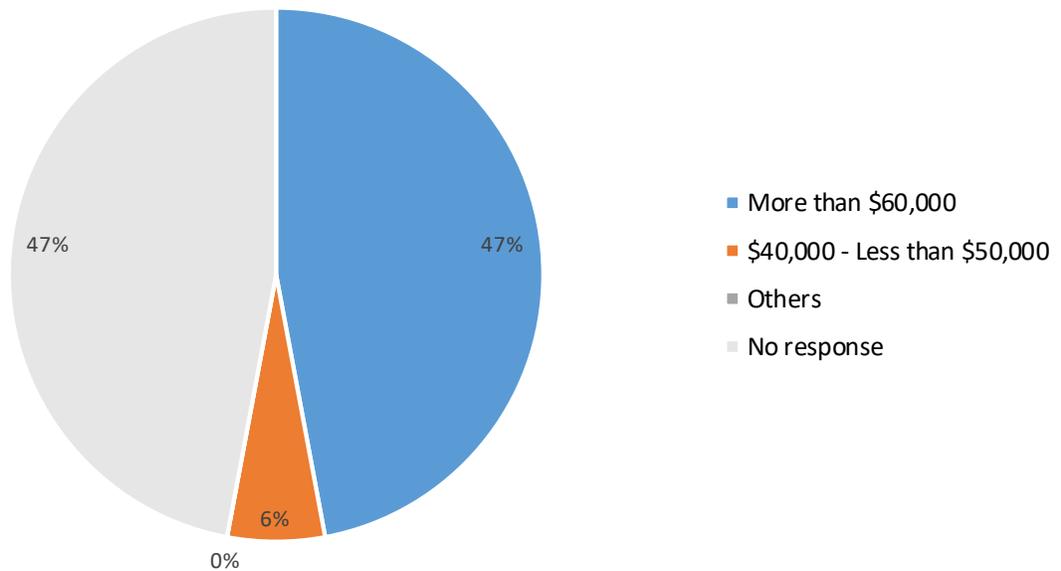
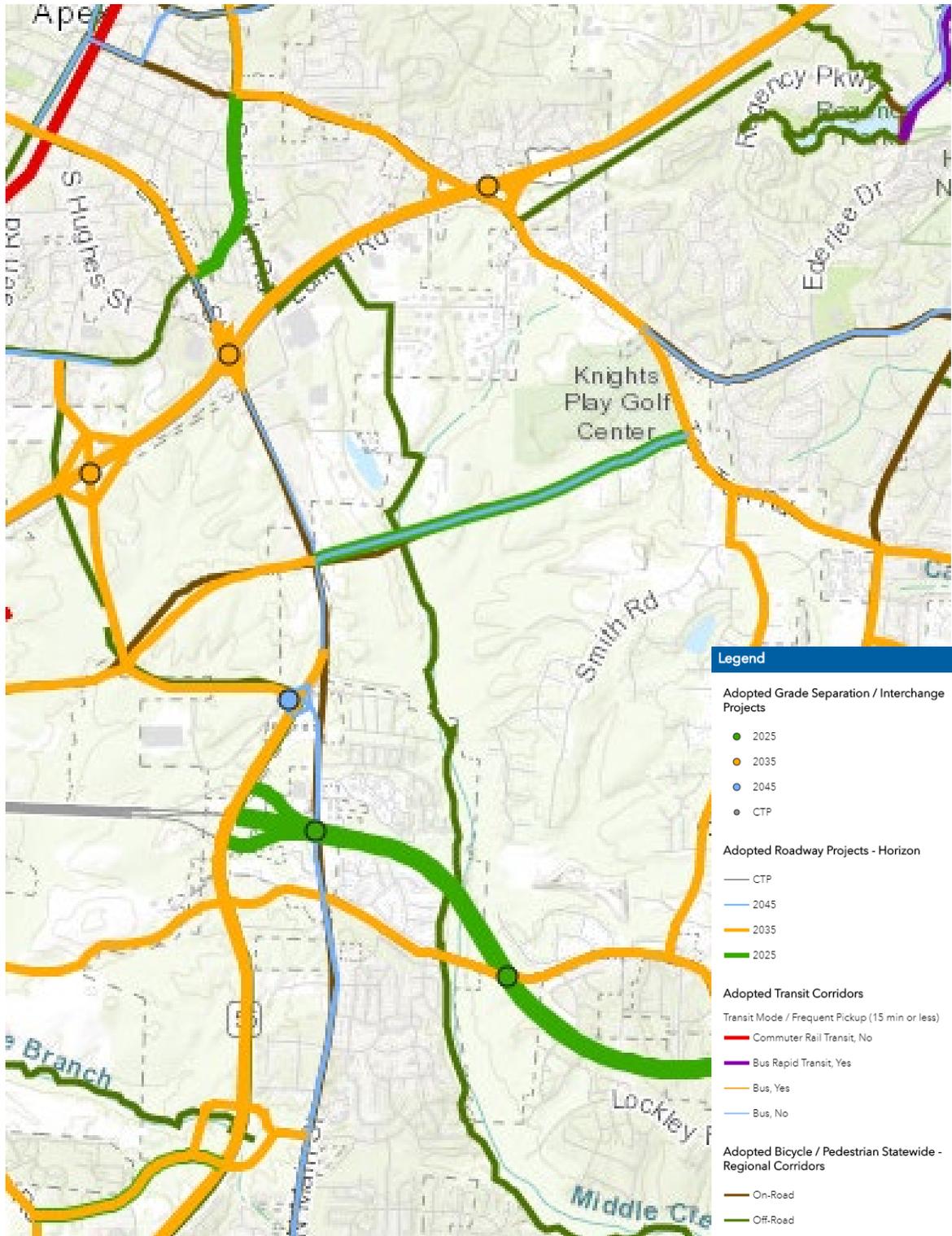


Figure 10. Distribution of annual household income for survey respondents



Appendix C: CAMPO Project Map



Legend

Adopted Grade Separation / Interchange Projects

- 2025
- 2035
- 2045
- CTP

Adopted Roadway Projects - Horizon

- CTP
- 2045
- 2035
- 2025

Adopted Transit Corridors

Transit Mode / Frequent Pickup (15 min or less)

- Commuter Rail Transit, No
- Bus Rapid Transit, Yes
- Bus, Yes
- Bus, No

Adopted Bicycle / Pedestrian Statewide - Regional Corridors

- On-Road
- Off-Road



Appendix D: Technical Reports

Traffic Forecast Report (March 2019)
Natural Resources Technical Memo (March 2019)
Community Characteristics Report (April 2019)
Traffic Capacity Analysis Report (June 2019)



FEASIBILITY STUDY REPORT – JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, NC

Traffic Forecast Report (March 2019)

March 1, 2019

■
421 Fayetteville St.
Suite 600
Raleigh, North Carolina
27601

Memorandum To: Russell Dalton
Town of Apex

From: Tim Padgett, PE
Kimley-Horn and Associates, Inc.

Subject: Traffic Forecast for Jessie Drive Extension, Apex, Wake County

This forecast has been reviewed and approved by the NCDOT Transportation Planning Division as of **November 28, 2018**.

Please find attached the 2018 traffic estimate and 2045 traffic forecast for the above referenced project. The following scenarios are provided:

- Base Year 2018 No-Build
- Base Year 2018 Build
- Future Year 2045 No-Build
- Future Year 2045 Build

This forecast was requested as part of the project feasibility study.

Project Area. The project area is in Wake County and entails the extension of Jessie Drive from NC 55 to Ten Ten Road.

The traffic forecast was performed for each of the following scenarios:

- Base Year 2018 No-Build
- Base Year 2018 Build
 - Jessie Drive connection from NC 55 to Ten Ten Road
- Future Year 2045 No-Build
 - Contains all projects in LRTP except Jessie Drive extension from NC 55 to Ten Ten Road
- Future Year 2045 Build
 - Jessie Drive connection from NC 55 to Ten Ten Road

Future Conditions and Development Activity. The forecast was developed using output from the Triangle Regional Model (TRMv6) along with growth trend information from historic traffic counts. Assumptions about future development activity and changes in the distribution of population and employment in the forecast study area are implicit in the model.

Forecast Methodology. The Base year 2018 estimates and Horizon Year 2045 forecasts provided were developed using a method under which observed traffic data as well as 2013 and 2045 model output (TRMv6) were considered.

Traffic Forecast Report

**Proposed Extension of Jessie Drive from NC 55 to Ten
Ten Road**

March 2019

Prepared By: Kimley-Horn and Associates, Inc.

Table of Contents

Traffic Forecast Report

1. Project Background
 - Project Request Information
2. Sources of Information and Data
 - Historic AADT
 - Field Data Collection
3. Base Year 2018 No - Build Forecast
 - Methodology
 - Determination of Design Factors
4. General Model Data
 - Model Information
5. Base Year 2018 Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors
6. Future Year 2045 No - Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors
7. Future Year 2045 Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors

Traffic Forecast Report

1. Project Background

Project Request Information

This forecast provides information related to the proposed extension of Jessie Drive between NC 55 and Ten Ten Road in Apex, Wake County, NC. The forecast base year is 2018 and the forecast build year is 2045.

Forecast variations include the following:

- Base Year 2018 No-Build
- Base Year 2018 Build
- Future Year 2045 No-Build
- Future Year 2045 Build

2. Sources of Information and Data

Historic AADT

Historic Average Annual Daily Traffic (AADT) volumes from 2002 through 2017 were used as part of the 2018 forecast process. Historic AADTs were available at the following locations.

- Ten Ten Road north of Jessie Drive
- NC 55 north of the proposed Jessie Drive Extension

Field Data Collection

Turning movement counts were collected in September, 2018 (13-hour TMC) at the Ten Ten Road/Jessie Drive intersection. 24-hour tube counts (camera) were collected at the same time on Ten Ten Road north of Jessie Drive and on NC 55 north of the proposed Jessie Drive extension.

3. Base Year 2015 No-Build Forecast

Methodology

Historic AADT information along with the turning movement counts were used to determine the current AADTs and turning movements on all facilities and at their intersections. The turning movements were balanced using the Traffic Forecast Utility Intersection Analysis tool.

Determination of Design Factors

Design factors for 2018 were calculated from turning movement counts. Factors include TTSTs, duals, D, and Design K Factor.

4. General Model Data

Model Information

The Triangle Regional Model (TRMv6) was used during the development of this forecast. The model has a base year of 2013 and a future year of 2045.

The model was coded and run for each of the following scenarios:

- 2013 (model) No-Build – No changes to existing 2013 model
- 2013 (model) Build – Jessie Drive coded from NC 55 to Ten Ten Road
- 2045 (model) No-Build – Jessie Drive connection between NC 55 and Ten Ten Road removed, all other MTP projects remain.
- 2045 (model) Build – No changes to existing 2045 model, Jessie Drive Extension is already included

Note that Jessie Drive west of NC 55 exists in the 2045 network. It is assumed that this link will be built in both the 2045 No-Build and 2045 Build forecasts.

5. Base Year 2018 Build Forecasts

Assumptions

The 2018 Build scenario includes coding Jessie Drive as a 4-ln median divided section between NC 55 and Ten Ten Road.

Methodology

The 2013 model was run for the build scenario and diversion was calculated. These diversions were then analyzed for logical comparison.

Model diversions were very small on NC 55 and Ten Ten Road with moderate traffic on Jessie Drive extension. The general pattern of movement consisted of NC 55 south traffic turning left on Jessie Drive to get to Ten Ten Road along with the reverse movement of Ten Ten Road north traffic using Jessie Drive to get to NC 55.

Because the NB model did not have Jessie Drive, no diversion could be calculated for this link. Final volumes were chosen based on model diversions, model volumes and engineering judgment.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor and truck percentage) due to the new connection to NC 55. All other design factors are assumed to remain the same as the No-Build condition.

6. Future Year 2045 No-Build Forecast

Assumptions

Within the Metropolitan Planning Organization (MPO) area, future forecasts are based on projects included in the Financial Plan for the 2045 Capital Area Metropolitan Planning

Organization (CAMPO) MTP. This information is included in the official version of the TRM (TRMv6). All development projected in the model is included as input to this forecast.

Known developments adjacent to the proposed Jessie Drive extension include the following:

- Jessie Commons (approved) – Office and Commercial development at future Jessie Drive/NC 55 Intersection
- Elite Waste Services (under construction) – reclamation services and dumpster rental
- Horton Park (approved) - residential

Methodology

For the Future Year 2045 No-Build Forecast, the following factors were considered when developing volumes. First, the historic growth in the area was calculated from AADT data for each link where AADT data was available. Second, the model growth in the area was calculated from model data (2013 to 2045) for each link. This data was factored from AWDT to AADT using the Traffic Survey Unit Average Week Day factors to provide a direct comparison to Historic AADT. In both cases (historic growth and model growth), the Average Annual Rate method was used to calculate growth.

Model growth was calculated by facility throughout the project area. In the case of historic AADTs, weighted averages ranged from 1.1% and 1.8%. In the case of model volumes, weighted averages generally ranged between 0.0% and 2.7%.

Growth percentages were calculated based on the available data. This information was analyzed, and appropriate values were applied to the 2018 No-Build Forecast using engineering judgment and turning movements and mainline volumes were balanced and adjusted as necessary.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor) due to the Horton Park development. All other design factors are assumed to remain the same as the No-Build condition.

7. Future Year 2045 Build Forecasts

Assumptions

The 2045 Build scenario includes coding Jessie Drive as a 4-ln median divided section between NC 55 and Ten Ten Road.

Methodology

Similar to the 2018 Build case, for the 2045 Build forecast, the 2045 model was run, and diversion was calculated.

Model diversions were similar in pattern to 2018. The final chosen diversions were based on these model calculations along with engineering judgment. These diversions were applied to the Future Year No-Build forecast for the Build scenario and each intersection was rebalanced.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor and Truck percentage) due to the new connection to NC 55 along with anticipated industrial type development adjacent to the corridor and the addition of the Horton Park development. All other design factors are assumed to remain the same as the No-Build condition.



*Jessie Drive
Improvements and
Extension Feasibility
Study*

**Base Year
2018**

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\frac{PM}{(d,t)}$ → D

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,t) Dual, TT-STs (%)

- Existing Roadway
- Road Widening
- - - Proposed Roadway

EXTENTS

*NC 55 (E Williams Street) between
US Route 1 and NC 540; Ten Ten
Road at Jessie Drive*

Wake County Division 5

PROJECT

*Extension of Jessie Drive in Apex,
NC to NC 55 (E Williams Street) from
Ten Ten Road*

SHEET 1 OF 2

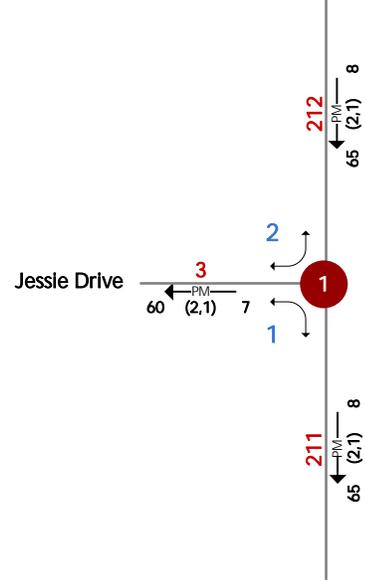
March 1, 2019



NC 55 (East Williams Street)

440
55 (2,1) 10

Ten Ten Road

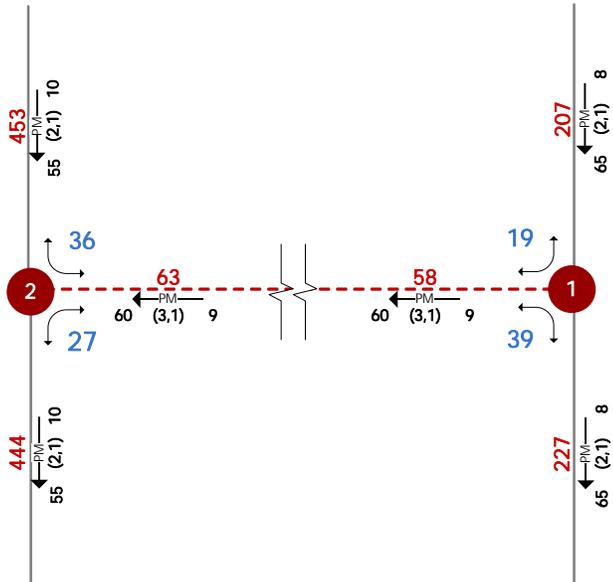


**2018
No-Build**

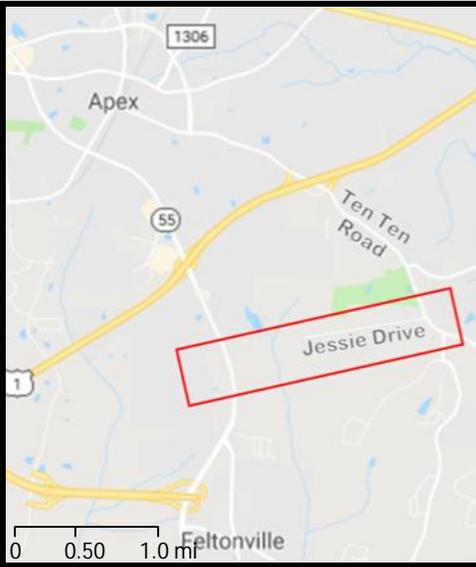
NC 55 (East Williams Street)

453
55 (2,1) 10

Ten Ten Road



**2018
Build**



*Jessie Drive
Improvements and
Extension Feasibility
Study*

Future Year 2045

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\frac{PM}{(d,t)}$ → D

DHV Design Hourly Volume (%) = K30
 PM PM Peak Period
 D Peak Hour Directional Split (%)
 → Indicates Direction of D
 (d,t) Dual, TT-STs (%)

— Existing Roadway
 — Road Widening
 - - - Proposed Roadway

EXTENTS

*NC 55 (E Williams Street) between
US Route 1 and NC 540; Ten Ten
Road at Jessie Drive*

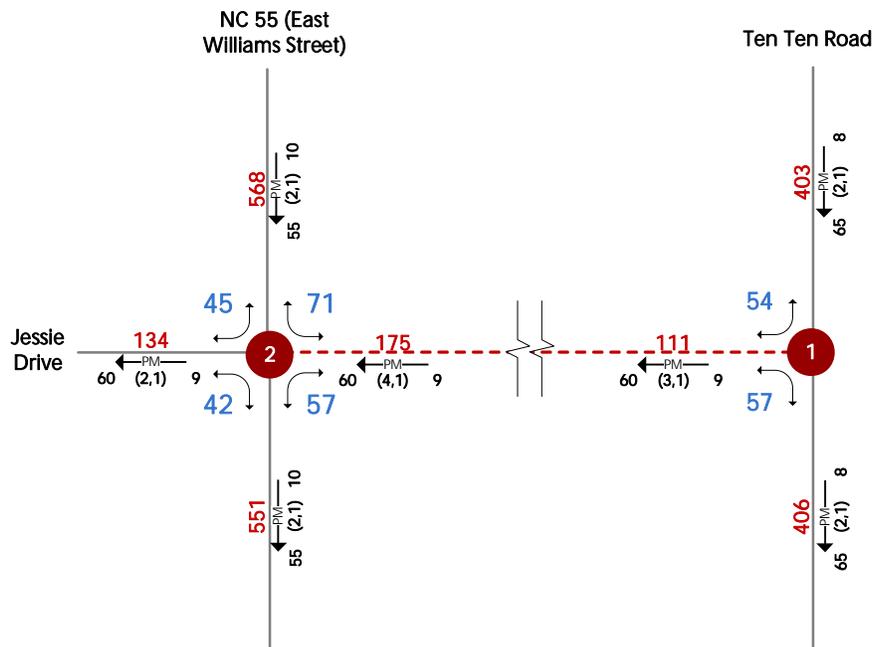
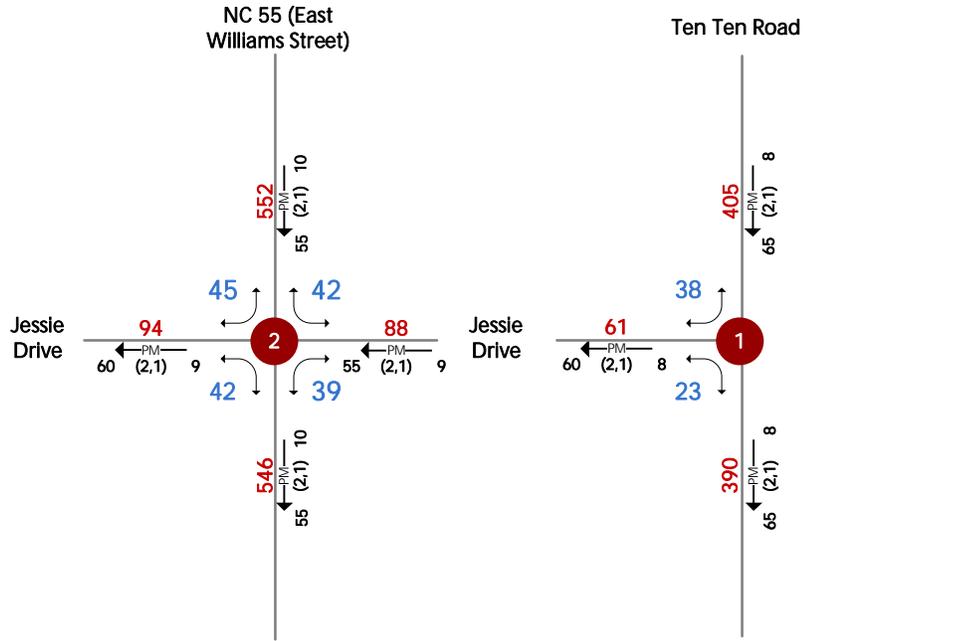
Wake County Division 5

PROJECT

*Extension of Jessie Drive in Apex,
NC to NC 55 (E Williams Street) from
Ten Ten Road*

SHEET 2 OF 2

March 1, 2019



Appendix A
Data Tables

Historic AADT Table

Location	NCDOT Historic Traffic Count Data						2018 Project Specific Count Data		2018 NB Forecast Chosen
	2012	2013	2014	2015	2016	2017	TMC	Mainline	
Ten-Ten Road South of Jessie Drive	-	-	-	-	-	-	20100	-	21100
Ten-Ten Road North of Jessie Drive	-	20000	-	19000	-	22000	20100	20300	21200
Jessie Drive West of Ten-Ten Road	-	-	-	-	-	-	300	-	300
E Williams Street South of Jessie Drive	-	-	-	-	-	-	0	45400	44000
E Williams Street North of Jessie Drive	-	42000	-	43000	-	43000	0	45400	44000
* Linear Growth									

Design Data

Location	D – Directional Distribution %			K – Peak Hour Factor %			% Trucks		
	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value
Ten-Ten Road South of Jessie Drive	65%	65%	65%	8%	8%	8%	(2,1)	(2,1)	(2,1)
Ten-Ten Road North of Jessie Drive	65%	65%	65%	8%	8%	8%	(2,1)	(2,1)	(2,1)
Jessie Drive West of Ten-Ten Road	60%	60%	60%	7%	7%	9%	(2,1)	(2,1)	(3,1)
E Williams Street South of Jessie Drive	55%	55%	55%	10%	10%	10%	(2,1)	(2,1)	(2,1)
E Williams Street North of Jessie Drive	55%	55%	55%	10%	10%	10%	(2,1)	(2,1)	(2,1)
Jessie Drive East of E Williams Street	-	-	60%	-	-	9%	-	-	(3,1)

Growth Rate Table

Location	Forecast (2018 No Build)	Historic Growth Rate		Model Growth Rate	Applied Rate	2045 NB Volumes	
	AADT	Approximate 5yr.*	Approximate 20yr.*	2013-2045		Model	Forecast
Ten-Ten Road South of Jessie Drive	21100	18.5%	-	2.7%	2.3%	32981	39000
Ten-Ten Road North of Jessie Drive	21200	-1.3%	0.0%	2.4%	2.4%	30602	40500
Jessie Drive West of Ten-Ten Road	300	-	-	-	11.8%	-	6100
E Williams Street South of Jessie Drive	44000	-	-	0.8%	0.8%	50716	54600
E Williams Street North of Jessie Drive	44000	-0.6%	1.8%	0.1%	0.8%	40915	55200
Jessie Drive West of E Williams Street	-	-	-	-	-	10432	9400
Jessie Drive East of E Williams Street	-	-	-	-	-	-	8800

* Linear Growth

Base Year Model Diversion Table (Build)

Location	2018 Forecast No Build	2013 Model No Build	2013 Model Build	Model Diversion	Diversion % Chosen	2018 Forecast Build
Ten-Ten Road South of Jessie Drive	21100	14199	15268	7.5%	7.6%	22700
Ten-Ten Road North of Jessie Drive	21200	14199	13897	-2.1%	-2.4%	20700
Jessie Drive West of Ten-Ten Road	300	-	4396	-	1833.3%	5800
E Williams Street South of Jessie Drive	44000	39780	39751	-0.1%	0.9%	44400
E Williams Street North of Jessie Drive	44000	39780	40507	1.8%	3.0%	45300
Jessie Drive East of E Williams Street	-	-	5646	0.0%	-	6300

2045 Model Diversion Table (Build)

Location	2045 Forecast No Build	2045 Model No Build	2045 Model Build	Model Diversion	Diversion % Chosen	2045 Forecast Build
Ten-Ten Road South of Jessie Drive	39000	32981	33462	1.5%	4.1%	40600
Ten-Ten Road North of Jessie Drive	40500	30602	30468	-0.4%	-0.5%	40300
Jessie Drive West of Ten-Ten Road	6100	-	6844	-	82.0%	11100
E Williams Street South of Jessie Drive	54600	50716	49833	-1.7%	0.9%	55100
E Williams Street North of Jessie Drive	55200	40915	41871	2.3%	2.9%	56800
Jessie Drive West of E Williams Street	9400	10432	14886	42.7%	42.6%	13400
Jessie Drive East of E Williams Street	8800	-	12054	-	98.9%	17500



FEASIBILITY STUDY REPORT – JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, NC

Natural Resources Technical Memo (March 2019)

ENVIRONMENTAL SCREENING REPORT

JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, WAKE COUNTY, NORTH CAROLINA

PREPARED BY:

Kimley»»Horn

KIMLEY-HORN AND ASSOCIATES, INC.

421 FAYETTEVILLE STREET, SUITE 600
RALEIGH, NORTH CAROLINA 27601
(919) 677-2000

KIMLEY-HORN FILE # 011200031

PREPARED FOR:
THE TOWN OF APEX, NORTH CAROLINA



MARCH 2019

CONTENTS

I. Project Description	1
II. Environmental Screening	1
Physical Resources, Soils, and Geology	1
Water Resources.....	2
Table 1: Surface Waters	2
Wetlands	3
Buffer Rules.....	3
Floodplains	3
Federally-Protected Species.....	3
Table 2: Federally listed species for Wake County, North Carolina.....	4

FIGURES

Figure 1 – Project Vicinity Map

Figure 2 – USGS Topographic Map

Figure 3 – NRCS Soil Survey Map

Figure 4 – Jurisdictional Features Map

I. PROJECT DESCRIPTION

The Town of Apex is performing a feasibility study to improve and extend Jessie Drive (SR 1304) in Apex, Wake County, North Carolina (**Figure 1**). The current conceptual design proposes improvements along the existing Jessie Drive from the intersection at Ten Ten Road (SR 1010) to the terminus of the existing section, and an extension from the existing terminus of Jessie Drive to NC 55 (East Williams Street). The project study corridor, a 500-foot buffer of the proposed alignment, is bounded to the north by recreational and industrial facilities, to the south by the approved Horton Park subdivision (currently in construction plan review) and the approved Middle Creek Pump Station, to the west by NC 55, and to the east by residential development. The project corridor will also be intersected by the future Middle Creek Greenway.

II. ENVIRONMENTAL SCREENING

The following is a preliminary review of the environmental resources that are in or near the project study corridor. The information obtained for this screening is readily available from state and federal agency databases. Site visits by Kimley-Horn environmental scientists were conducted on August 13, 2018, August 20, 2018, and September 13, 2018. Field investigations were undertaken to determine natural resource conditions and to document wildlife and the presence of protected species or their habitats. A detailed delineation was conducted as part of these investigations. An agency field review with the U.S. Army Corps of Engineers (USACE) and the N.C. Department of Environmental Quality (NCDEQ) Division of Water Resources (DWR) has not yet been conducted.

PHYSICAL RESOURCES, SOILS, AND GEOLOGY

The project corridor is located in the piedmont physiographic region of North Carolina. Topography is moderate within the project corridor and ranges from roughly 370 to 500 feet in elevation (**Figure 2**).

There are sixteen mapped soil types located within the project corridor, as shown in **Figure 3**. The following soils occur within the project corridor:

1. AaA – Altavista fine sandy loam, 0 to 4% slopes, rarely flooded
2. CeB – Cecil sandy loam, 2 to 6% slopes
3. CeC – Cecil sandy loams, 6 to 10% slopes
4. CfC – Cecil-Urban land complex, 2 to 10% slopes
5. ChA – Chewacla and Wehadkee soils, 0 to 2% slopes, frequently flooded
6. CrB – Creedmoor-Green Level complex, 2 to 6% slopes
7. CrC – Creedmoor-Green Level complex, 6 to 10% slopes
8. CrD – Creedmoor-Green Level complex, 10 to 15% slopes
9. HeB – Helena sandy loam, 2 to 6% slopes
10. HrB – Herndon silt loam, 2 to 6% slopes
11. HrC – Herndon silt loam, 6 to 10% slopes
12. NaE – Nanford silt loam, 15 to 25% slopes
13. PaC – Pacolet sandy loam, 6 to 10% slopes
14. PaD – Pacolet sandy loam, 10 to 15% slopes
15. UdE – Udorthents loamy, 0 to 25% slopes
16. Ur – Urban land

Based on the National List of Hydric Soils from the Natural Resources Conservation Service (NRCS), Cecil sandy loam (CeB, CeC, CfC), Creedmoor-Green Level complex (CrB, CrC, CrD), Helena sandy loam (HeB), Herndon silt loam (HrB, HrC), Nanford silt loam (NaE), Pacolet sandy loam (PaC, PaD), Udorthents loam (UdE), and Urban land (Ur) are classified as non-hydric soils in Wake County. The NRCS classifies Altavista fine sandy loam (AaA) and Chewacla and Wehadkee soils (ChA) as primarily hydric soils that may contain significant inclusions or hydric components.

The NRCS defines a hydric soil as one that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil. Such soils typically support hydrophytic vegetation and may be considered jurisdictional wetlands. The areas of hydric soil identified within the project corridor are associated with the floodplains of four unnamed tributaries to Middle Creek and Middle Creek. A detailed discussion of the wetlands and waters identified within the study area is included below.

WATER RESOURCES

The project is located in the Cape Fear River Basin (United States Geological Survey [USGS] Hydrologic Unit Code [HUC] 03030004) and the Neuse River Basin (USGS HUC 03020201). Water resources were investigated within the study area plus the area 50' outside of the project boundary to account for any regulated Neuse River Riparian Buffers. Seven jurisdictional streams were identified in or within 50' of the project corridor (**Figure 4**). Information regarding these streams can be found in Table 1 below.

Table 1: Surface Waters

Stream Name	Map ID	Flow Regime	NCDWR Index Number	Best Usage Classification	Subject to Buffer Rules
Middle Creek	Middle Creek	Perennial	27-43-15-(1)	C; NSW	Yes
UT to Middle Creek	S1	Intermittent	27-43-15-(1)	C; NSW	Yes
UT to Middle Creek	S2	Perennial	27-43-15-(1)	C; NSW	Yes
UT to Middle Creek	S3	Intermittent; Perennial	27-43-15-(1)	C; NSW	Yes
UT to Middle Creek	S4	Perennial	27-43-15-(1)	C; NSW	Yes
UT to Little Branch	S6	Intermittent; Perennial	18-7-6-1-1	C	No
UT to Little Branch	S7	Intermittent	18-7-6-1-1	C	No

In accordance with Section 303(d) of the Clean Water Act, states are required to develop a list of water bodies not meeting federal water quality standards or that have impaired uses. Middle Creek within the project corridor is listed for having a Benthos (Nar, AL, FW) rating of “Fair” on the 2016 Final 303(d) list of impaired waters.

There are no water supply watersheds, Outstanding Resource Waters (ORW), or High Quality Waters (HQW) within the study corridor or within one mile downstream of the project corridor.

WETLANDS

Field investigations conducted by Kimley-Horn staff identified three wetlands within project corridor, as shown on **Figure 4**. Wetland W1 is a headwater wetland that is located along stream S3 in the project corridor. Stream S3 flows out of a stormwater pond and dissipates into wetland W3 before reforming further offsite. Wetland W2 is a relic beaver pond along Middle Creek. The beaver pond appears to have been drained within the last 10 years, but still contains very strong hydric soils and early successional, hydrophytic vegetation. Wetland W3 is a floodplain wetland located along stream S2. Wetland W3 appears to receive primary hydrology from overbank flooding from stream S2.

BUFFER RULES

The eastern portion of the project corridor is located within the Neuse River Basin and, therefore, streamside riparian areas may be subject to the Neuse River Basin Buffer Rules administered by NCDWR. Table 1 above indicates which streams are subject to buffer rule protection. The Neuse River Basin Buffer Rules require a 50-foot wide riparian buffer adjacent to surface waters that are mapped on either the NRCS Soil Survey Map or the most recent 1:24,000 (7.5 minute) USGS Topographic Map. In addition to the buffer requirements administered by NCDWR, the Town of Apex Unified Development Ordinance (UDO) requires an additional 50-foot buffer be placed on all perennial streams located within the Town’s extraterritorial jurisdiction (ETJ). Potential impacts to protected stream buffers will be determined once a final alignment and design have been determined.

FLOODPLAINS

The FEMA Digital Flood Insurance Rate Map (DFIRM) panels 3720074100J and 3720075100J (effective May 2, 2006) indicate there are 0.2% Annual Flood Hazards, 1% Annual Flood Hazards (Zone AE), and FEMA-regulated floodways located in the project corridor along Middle Creek (**Figure 4**).

FEDERALLY-PROTECTED SPECIES

As of June 27, 2018, the US Fish and Wildlife Service (USFWS) lists six threatened or endangered species known to occur in Wake County. In addition, the USFWS Environmental Conservation Online System (ECOS) lists one proposed species known to occur in Wake County. Table 2 shows the listed species and federal status of each of these species. Kimley-Horn reviewed the NC Natural Heritage Program (NCNHP) element occurrence database (updated January 2019) to determine if there are any known occurrences of federally-listed species in the project corridor or the project vicinity. The NCNHP records indicate no known occurrences on any federally protected species in or within 1.0-mile of the project corridor.

Table 2: Federally listed species for Wake County, North Carolina

Species	Common Name	Federal Status	Habitat Present	Biological Conclusion
<i>Rhus michauxii</i>	Michaux's sumac	E	Yes	No Effect
<i>Notropis mekistocholas</i>	Cape Fear shiner	E	No	No Effect
<i>Picoides borealis</i>	Red-cockaded woodpecker	E	No	No Effect
<i>Alasmidonta heterodon</i>	Dwarf wedgemussel	E	No	No Effect
<i>Parvaspina steinstansana</i>	Tar River spiny mussel	E	No	No Effect
<i>Elliptio laceolata</i>	Yellow lance	T	No	No Effect
<i>Fusconaia masoni</i>	Atlantic pigtoe	PT	No	No Effect

E – Endangered

T – Threatened

PT – Proposed Threatened

Michaux's sumac

Biological conclusion: No Effect

Michaux's sumac is a plant that prefers sandy or rocky open communities. The plant survives best in areas where some form of disturbance has provided an open area (i.e. highway rights-of-ways, roadsides, or on the edges of artificially maintained clearings). Potentially suitable habitat for Michaux's sumac exists along the maintained easements, yard edges, and roadside corridors within the project corridor. Although these areas provide potentially suitable habitat, the regular mowing maintenance schedule and herbicide application within these areas would likely inhibit the plant's success. Kimley-Horn biologists conducted pedestrian surveys for Michaux's sumac within areas of suitable habitat on September 13, 2018, and no individuals were observed. Additionally, a review of the NCNHP database records reveals no known occurrences of Michaux's sumac within 1.0-mile of the project corridor. Due to the lack of known occurrences and the lack of observed individuals, it has been determined that the proposed project will have "No Effect" on Michaux's sumac.

Cape Fear shiner

Biological conclusion: No Effect

The Cape Fear shiner is known only from the Cape Fear River watershed. The shiner prefers streams with clean gravel, cobble, or boulder substrates where it inhabits slow pools, riffles, and slow runs. Suitable habitat for the Cape Fear shiner is not present within the project corridor. The two streams (S6 and S7) in the project corridor that occur within the Cape Fear River watershed are at the very top of the watershed and do not contain clean gravel, cobble, or boulder substrates. In addition, these streams have been degraded in nature due to their proximity to an old landfill. A review of the NCNHP database records reveals no known occurrences of Cape Fear shiner within 1.0-mile of the project corridor. Due to the lack of known occurrences and the lack of suitable habitat, it has been determined that the proposed project will have "No Effect" on the Cape Fear shiner.

Red-cockaded woodpecker

Biological conclusion: No Effect

The red-cockaded woodpecker (RCW) typically occupies open, mature stands of southern pines, particularly longleaf pine (*Pinus palustris*), for foraging and nesting habitat. The RCW excavates cavities for nesting in living pine trees, aged 60 years or older, which are contiguous with pine stands at least 30 years of age for foraging habitat. The foraging range for RCW is normally less than 0.5 miles. Suitable habitat is not present within the project corridor due to the lack of open, mature pine stands for foraging or nesting. Forests within the project corridor are composed of successional mixed pine and hardwoods with dense understories that are dominated by a mix of hardwood saplings and shrubs. Additionally, a review of the NCNHP database records reveals no known occurrences of RCW within 1.0-mile of the project corridor. Due to the lack of suitable habitat and a lack of known occurrences, it has been determined that the proposed project will have “*No Effect*” on RCW.

Dwarf wedgemussel

Biological conclusion: No Effect

In North Carolina, the dwarf wedgemussel is known from the Neuse River and Tar River drainages. The mussel inhabits creek and river areas with a slow to moderate current and sand, gravel, or firm silt bottoms. Water in these areas must be well oxygenated. Stream banks in these areas are generally stable with extensive root systems holding soils in place. Suitable habitat for the dwarf wedgemussel is not present within the project corridor due to the lack of well-oxygenated, perennial streams with stable banks. Streams in the project corridor have been impacted by sediment discharge and the banks are typically vertical with frequent failures and sloughing along the evaluated reaches. A review of the NCNHP database records reveals no known occurrence of dwarf wedgemussel within 1.0 mile of the project corridor. According to the NCNHP records, the nearest known occurrence of dwarf wedgemussel is located approximately 20 river miles downstream from the project corridor at the confluence of Little Creek and Middle Creek. Additionally, streams within the project corridor are separated from the known dwarf wedgemussel population by Sunset Lake, a man-made reservoir with a dam. Due to the lack of habitat, the lack of known occurrences, and the distance from the most recent known occurrence, along with constructed impediments to fish movement, it has been determined that the proposed project will have “*No Effect*” on dwarf wedgemussel.

Tar River spiny mussel

Biological conclusion: No Effect

The Tar River spiny mussel is endemic to the Tar River and Neuse River drainage basins in North Carolina. This mussel requires a stream with fast flowing, well-oxygenated, circumneutral pH water. The bottom should be composed of unconsolidated gravel and coarse sand. The water needs to be relatively silt-free, and stream banks should be stable, typically with many roots from adjacent riparian trees and shrubs. Suitable habitat for the Tar River spiny mussel is not present within the project corridor due to the lack of well-oxygenated, perennial streams with stable banks. Streams in the project corridor have been impacted by sediment discharge and the banks are typically vertical with frequent failures and sloughing along the evaluated reaches. Streams in the project corridor also lack the substrate and variation in hydrological flow structure, such as riffles and pool complexes, typically found in suitable mussel habitat. Additionally, a review of the NCNHP database records shows no known occurrences of Tar River spiny mussel within 1.0-mile of the project corridor. According to the NCNHP records, the

nearest known occurrence of Tar River spiny mussel is located more than 50 river miles downstream from the project corridor. Due to the lack of habitat, the lack of known occurrences, and the distance from the most recent known occurrence, it has been determined that the proposed project will have “*No Effect*” on Tar River spiny mussel.

Yellow lance

Biological conclusion: No Effect

The yellow lance is endemic to the Chowan, Tar, and Neuse river drainage basins in North Carolina. The freshwater mussel prefers coarse sandy substrate and sometimes prefers lightly graveled sandy substrate. Yellow lances are often found in mixed sand and gravel substrate at the base of a stream riffle. The mussel also requires clean streams that are well-oxygenated, with moderate flow and little sediment discharge. Suitable habitat for the yellow lance is not present within the project corridor due to the lack of well-oxygenated, moderate-flow streams with stable banks. Streams in the project corridor have been impacted by sediment discharge and the banks are typically vertical with frequent failures and sloughing along the evaluated reaches. Streams in the project corridor also lack the substrate and variation in hydrological flow structure, such as riffles and pool complexes, typically found in suitable mussel habitat. Additionally, a review of the NCNHP database records shows no known occurrences of yellow lance within 1.0-mile of the project corridor. Due to the lack of habitat, and the lack of known occurrences, it has been determined that the proposed project will have “*No Effect*” on yellow lance.

Atlantic pigtoe

Biological conclusion: No Effect

The Atlantic pigtoe prefers streams with coarse sand and gravel substrates. The Atlantic pigtoe typically inhabits medium to large streams with clean, swift flow and stable substrate. The most abundant populations historically existed in streams with excellent water quality with swift flows and silt-free substrates. Suitable habitat for the Atlantic pigtoe is not present within the project corridor. Streams within the project corridor contain large amounts of silt and sediment due to adjacent development and past beaver activity. A review of the NCNHP database records shows no known occurrence of Atlantic pigtoe within 1.0 mile of the project corridor. According to the NCNHP records, the nearest known occurrence of Atlantic pigtoe is located approximately 6.5 river miles downstream of the project corridor in Middle Creek. However, this occurrence separated from the project corridor by Sunset Lake, a man-made reservoir with a dam. The Atlantic pigtoe is currently listed as “Proposed Threatened” and, for that reason, is not currently protected under the Endangered Species Act. If the Atlantic pigtoe is listed as “Threatened” by the USFWS prior to project construction, a Biological Conclusion will need to be rendered. Due to the lack of suitable habitat, the lack of known occurrences within 1.0 mile of the project area, and the dam and impoundment separating the project corridor from downstream populations, it is anticipated that the proposed project would have “*No Effect*” on Atlantic pigtoe.

Northern long-eared bat – Programmatic Biological Opinion (PBO)

The USFWS has developed a programmatic biological opinion (PBO) in conjunction with the Federal Highway Administration (FHWA), the US Army Corps of Engineers (USACE), and NCDOT for the northern long-eared bat (NLEB) in eastern North Carolina. The PBO covers the entire NCDOT program in Divisions 1-8, including all NCDOT projects and activities. The programmatic determination for NLEB for the NCDOT program is May Affect, Likely to Adversely Affect. The PBO provides incidental take

coverage for NLEB and will ensure compliance with Section 7 of the Endangered Species Act for five years for all NCDOT projects with a federal nexus in Divisions 1-8, which includes Wake County, where the proposed project is located. This level of incidental take is authorized from the effective date of a final listing determination through April 30, 2020.

Bald and Golden Eagle Protection Act (BGPA)

Habitat for the bald eagle primarily consists of mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.

A desktop-GIS assessment of the project corridor, as well as the area within a 1.13-mile radius (1.0 mile plus 660 feet) of the project limits, was performed in November 2018 using 2017 color aeriels. No water bodies large enough or sufficiently open to be considered potential feeding sources were identified. Since there was no foraging habitat within the review area, a survey of the project corridor and the area within 660 feet of the project limits was not conducted. Additionally, a review of the NCNHP database, updated January 2019, revealed no known occurrences of this species within 1.0 mile of the project corridor. Due to the lack of habitat, known occurrences, and the minimal impact anticipated for this project, it has been determined that this project will not affect this species.

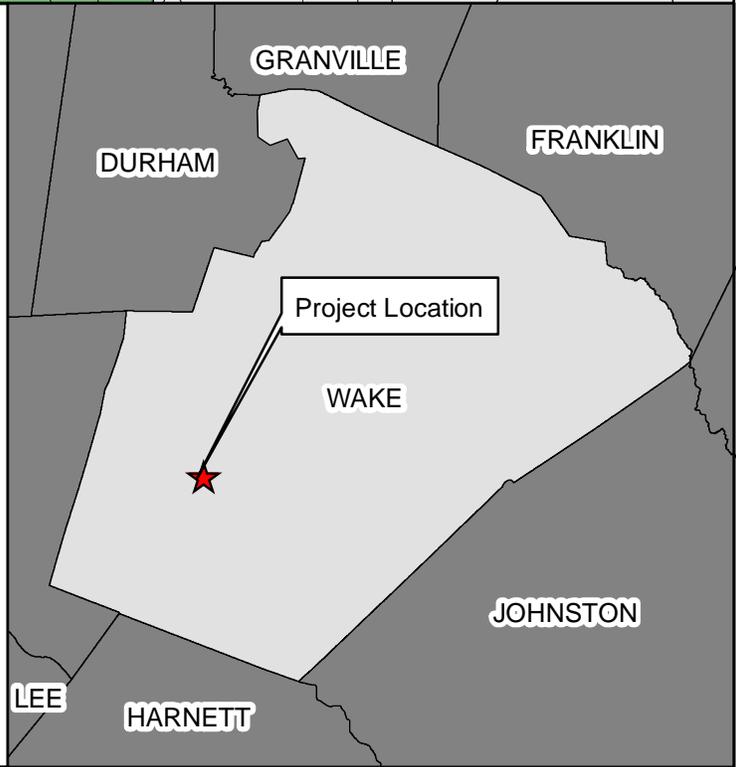
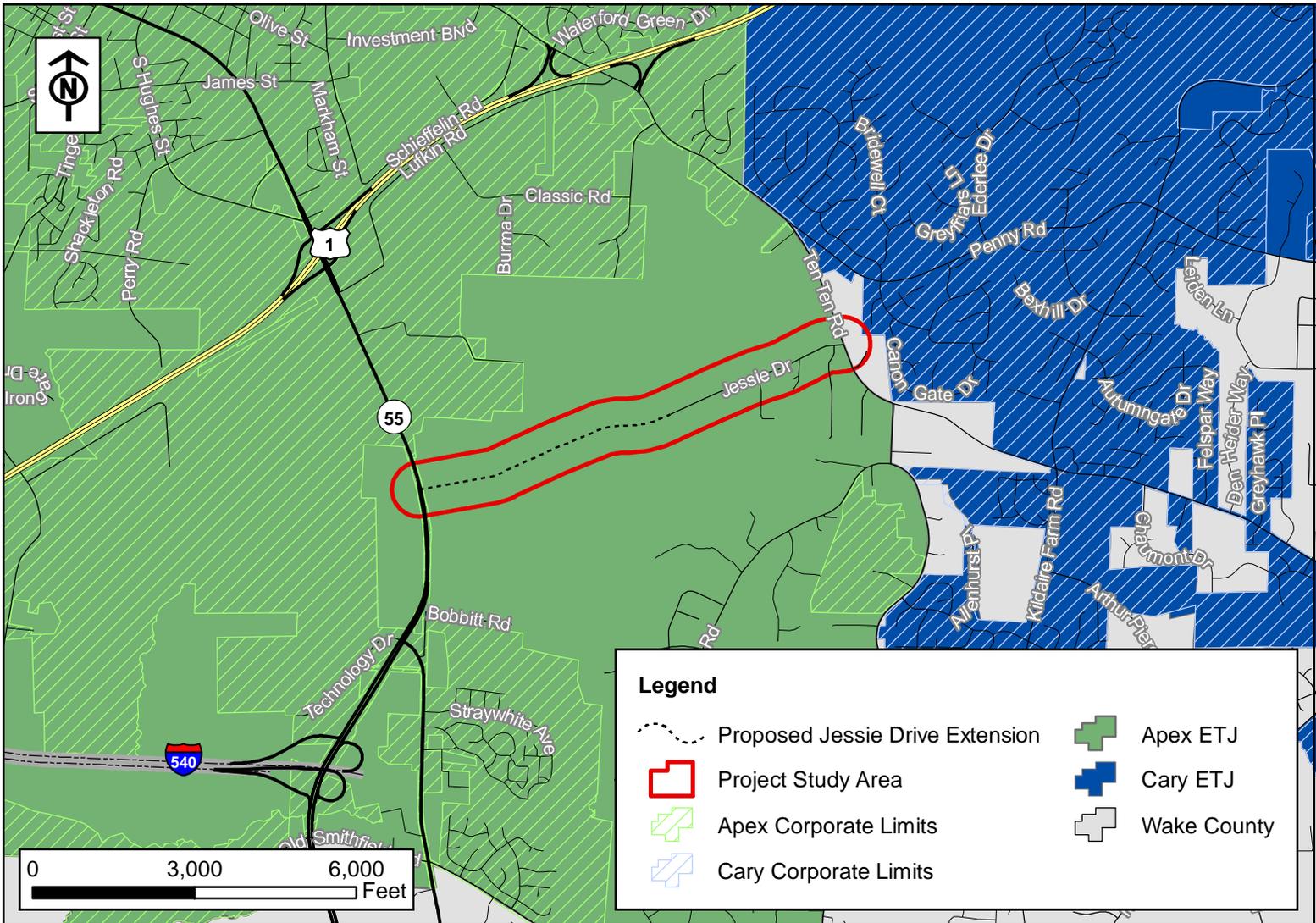
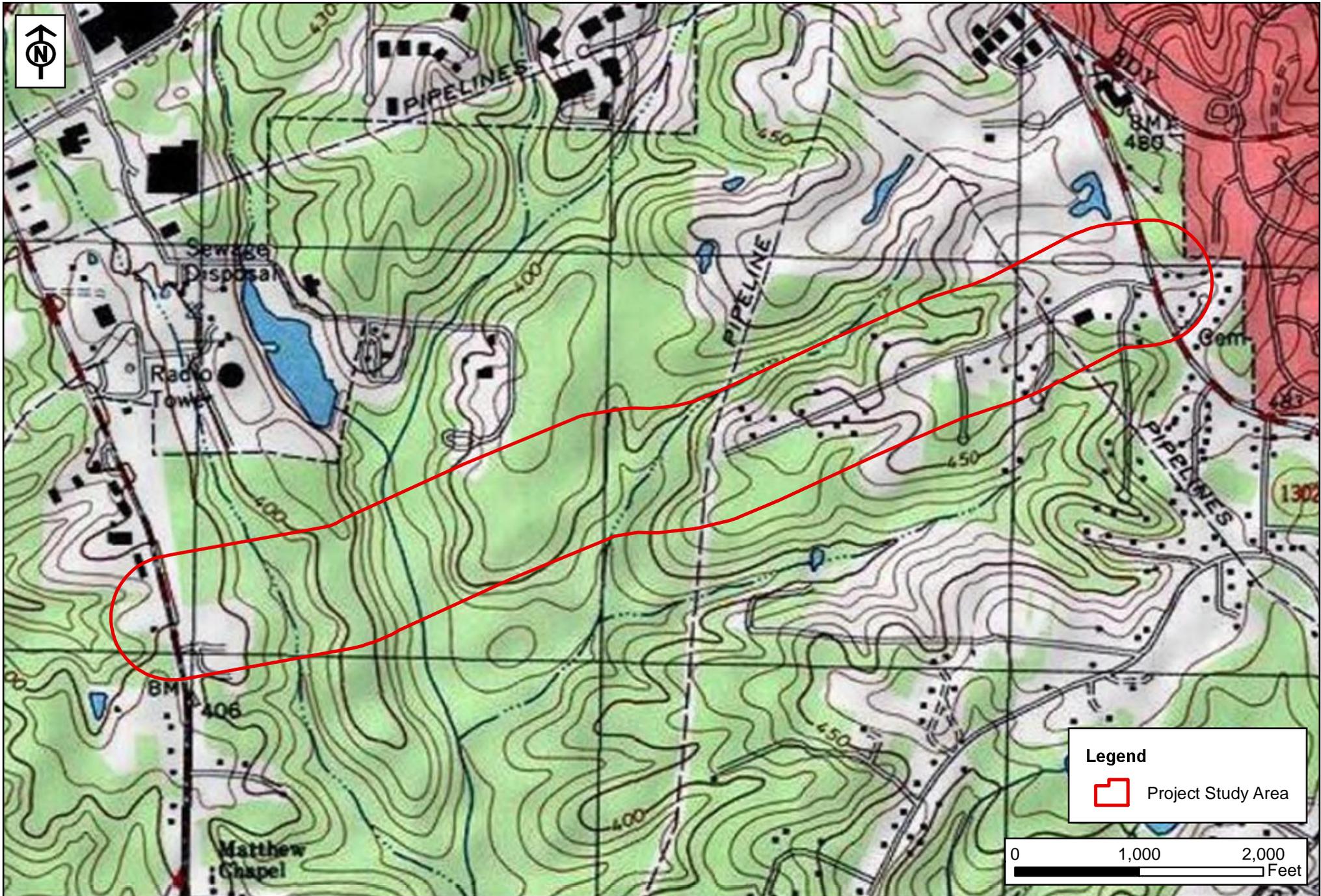


Figure 1: Vicinity Map
 Jessie Drive Improvements and Extension
 Apex, Wake County, NC



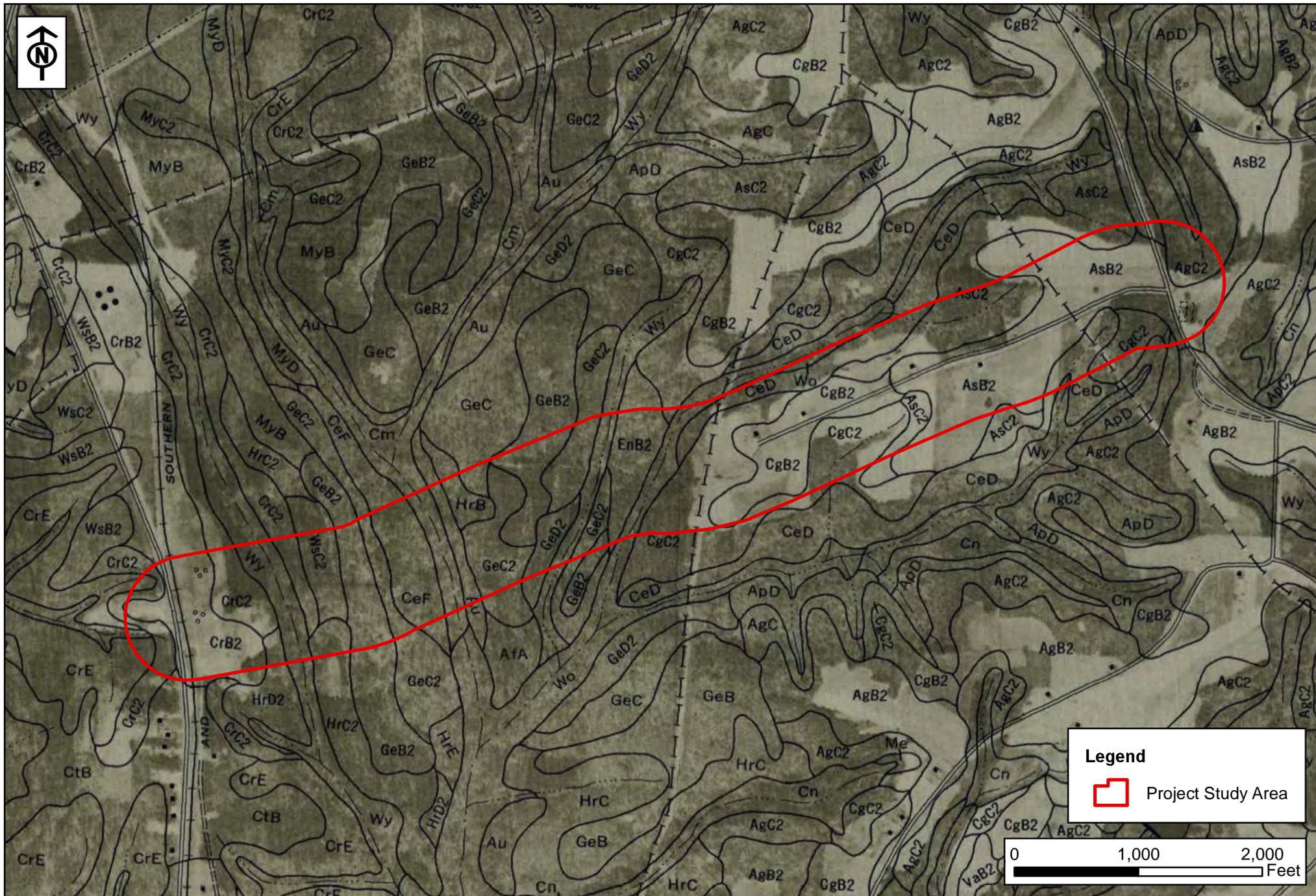
Legend

 Project Study Area

0 1,000 2,000
Feet



Figure 2: USGS Topographic Map
(Apex Quad)
Jessie Drive Improvements and Extension
Apex, Wake County, NC



Legend

 Project Study Area

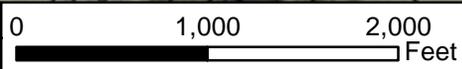
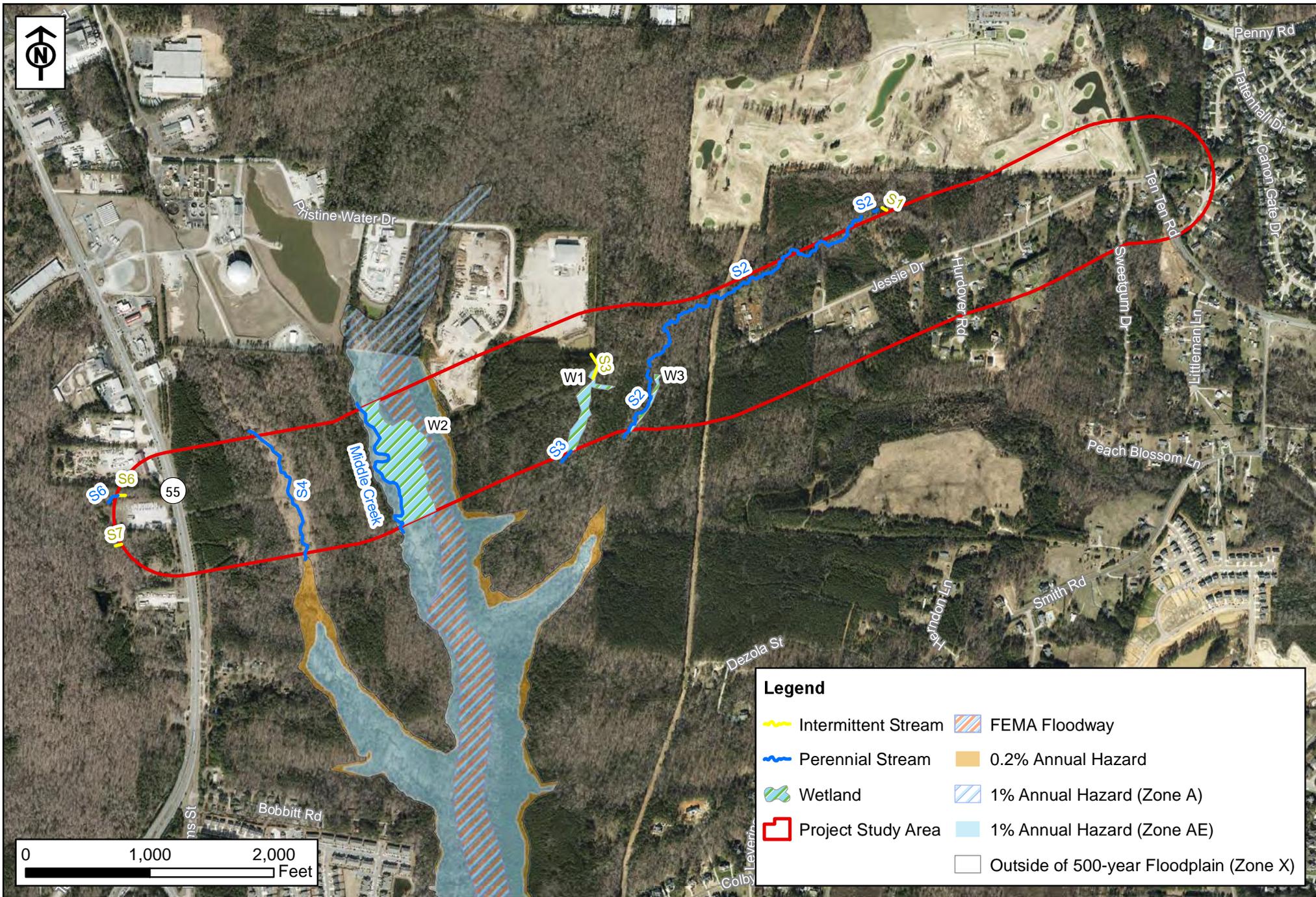


Figure 3: NRCS Soil Survey Map
(Wake County, 1970)
Jessie Drive Improvements and Extension
Apex, Wake County, NC



Legend

Intermittent Stream	FEMA Floodway
Perennial Stream	0.2% Annual Hazard
Wetland	1% Annual Hazard (Zone A)
Project Study Area	1% Annual Hazard (Zone AE)
	Outside of 500-year Floodplain (Zone X)

Figure 4: Jurisdictional Features Map
 Jessie Drive Improvements and Extension
 Apex, Wake County, NC





FEASIBILITY STUDY REPORT – JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, NC

Community Characteristics Report (April 2019)



Jessie Drive Improvements and Extension Wake County

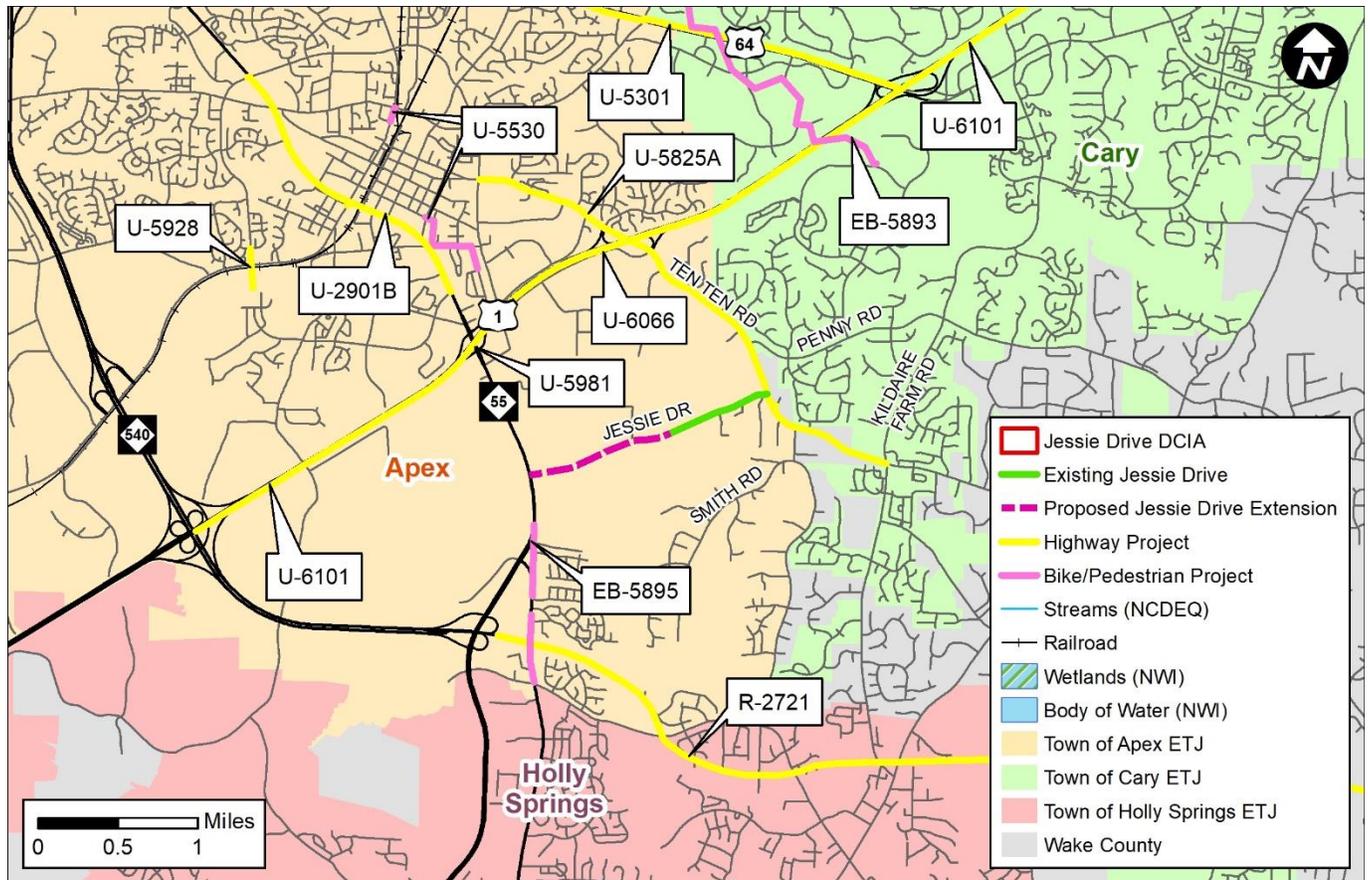
COMMUNITY CHARACTERISTICS REPORT

EXECUTIVE SUMMARY

PLANNER, FIRM:	Teresa Gresham, P.E., Kimley-Horn	DIVISION: 5	Existing No. of Lanes: 2	Existing Median: No
NCDOT/LOCAL PROJECT MANAGER:	Russell Dalton, PE, Town of Apex	WBS: N/A	Proposed No. of Lanes: Interim: 2 lanes Ultimate: 4-lane divided	Addition of Median(s): Yes
DOCUMENT TYPE:	Existing control of access:		Proposed control of access:	
<input checked="" type="checkbox"/> NEPA <input type="checkbox"/> SEPA	<input checked="" type="checkbox"/> No Control <input type="checkbox"/> Partial Control <input type="checkbox"/> Limited Control <input type="checkbox"/> Full Control		<input type="checkbox"/> No Control <input checked="" type="checkbox"/> Partial Control <input type="checkbox"/> Limited Control <input type="checkbox"/> Full Control	
CS PROJECT REVIEWER :				

PROJECT DESCRIPTION: Construct improvements and an extension of Jessie Drive from Ten Ten Road (SR 1010) to NC 55 (East Williams Street). The Town plans to build the project in two phases. Phase I would improve and extend Jessie Drive as a two-lane, median-divided road with a multiuse path on both sides. Phase II would widen Jessie Drive to a four-lane, median-divided road with a multiuse path on both sides.

Community Context



The proposed project is located within Wake County on the southeast side of the Town of Apex. Land use in the project area consists primarily of undeveloped land with residential use concentrated in the vicinity of Ten Ten Road and commercial facilities concentrated along East Williams Street.

Notable Characteristics

- Sidewalk is located along NC 55, and North Carolina Bike Route 5 or “Cape Fear Run” is located along Ten Ten Road through the Direct Community Impact Area (DCIA).
- The Apex Police Department, Apex Fire Department, and Wake County Emergency Medical Services (WCEMS) provided input on the proposed project. Overall, the feedback was that annexed areas in the vicinity of the Jessie Drive corridor currently receive emergency services from the Town of Apex, but these areas are difficult to access. The widening and extension of Jessie Drive will substantially improve connectivity to these annexed areas.
- While Census data does not indicate a notable presence of populations meeting the criteria for Environmental Justice or protected by Title VI and related statutes within the Demographic Study Area (DSA), low-income communities were observed within the Direct Community Impact Area (DCIA) during the field.
- Census data indicates a Spanish language-speaking population that meets or exceeds the U.S. Department of Justice Limited English Proficiency (LEP) Safe Harbor threshold within the Demographic Study Area.

Potential Project Impacts

- Bicycle and pedestrian facilities are being considered as part of the proposed project, and if constructed would create connectivity and increase mobility within the Town of Apex.
- The widening and extension of Jessie Drive will substantially improve connectivity to the annexed areas in the vicinity of the Jessie Drive corridor, and therefore, reduce response times, increase the level of emergency service to Apex customers, and improve health, safety, and wellbeing in the community.
- Notably adverse community impacts are anticipated with this project but appear to affect all populations equivalently; thus, impacts to minority and low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI and related statutes.

Recommendations

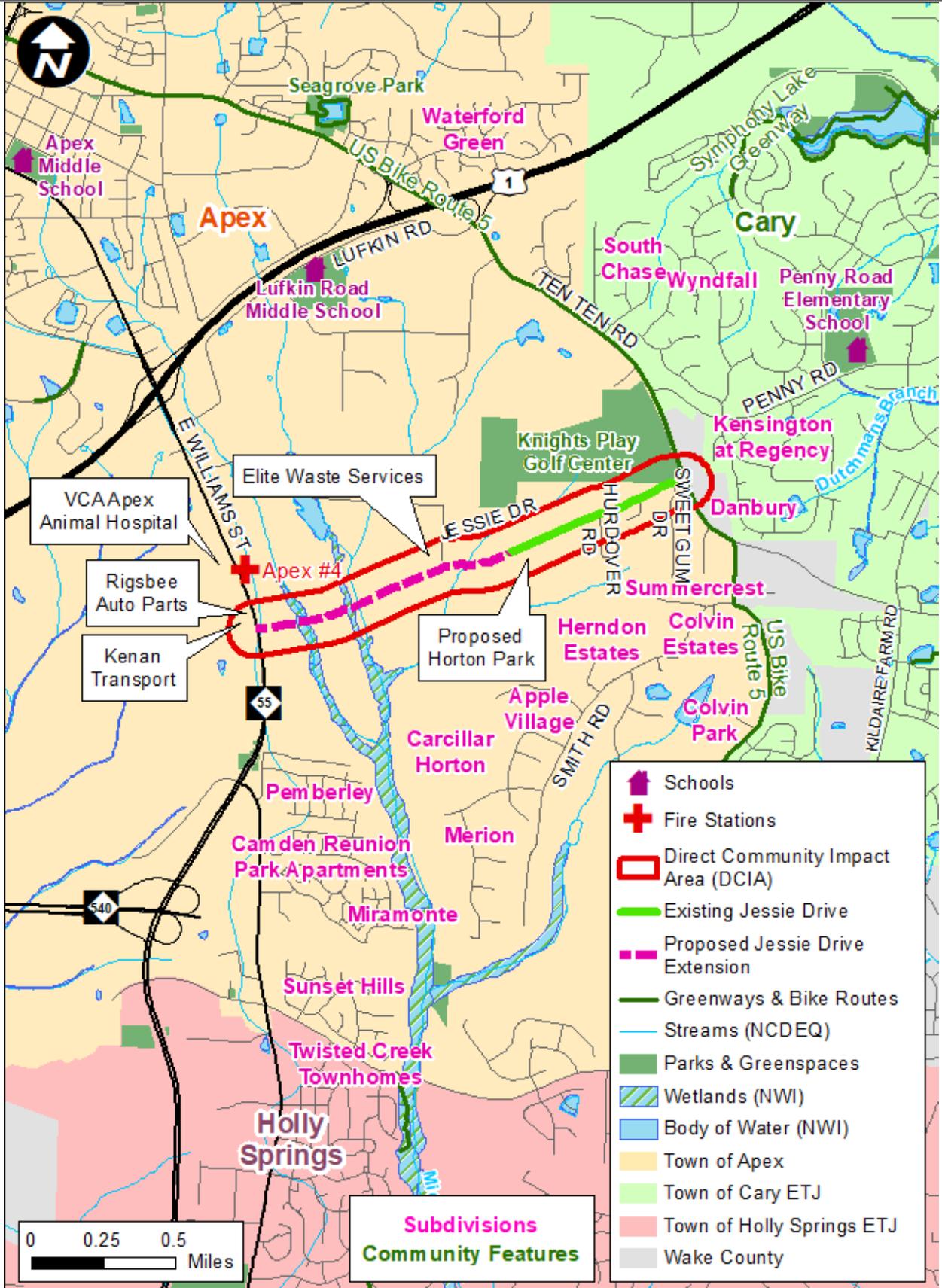
- The Town of Apex Project Manager should coordinate with the Town of Apex and NCDOT to evaluate the necessary level of bicycle and pedestrian accommodations for the proposed project.
- The Town of Apex Project Manager should ensure that the design of Jessie Drive and its intersections with NC 55 and Ten Ten Road provide adequate turning radii and access for emergency vehicles; and that design includes right-in/right out access and reduces the amount of left-turn movements, four-way stops, and direct access to residential driveways to the extent practicable.
- Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.
- Because LEP populations within the DSA exceed the Department of Justice’s Safe Harbor thresholds, written translations of vital documents should be provided for Spanish language-speaking populations, in addition to other measures assuring meaningful language access, as determined by NCDOT Public Involvement to satisfy the requirements of Executive Order 13166.

Indirect and Cumulative Effects Statement

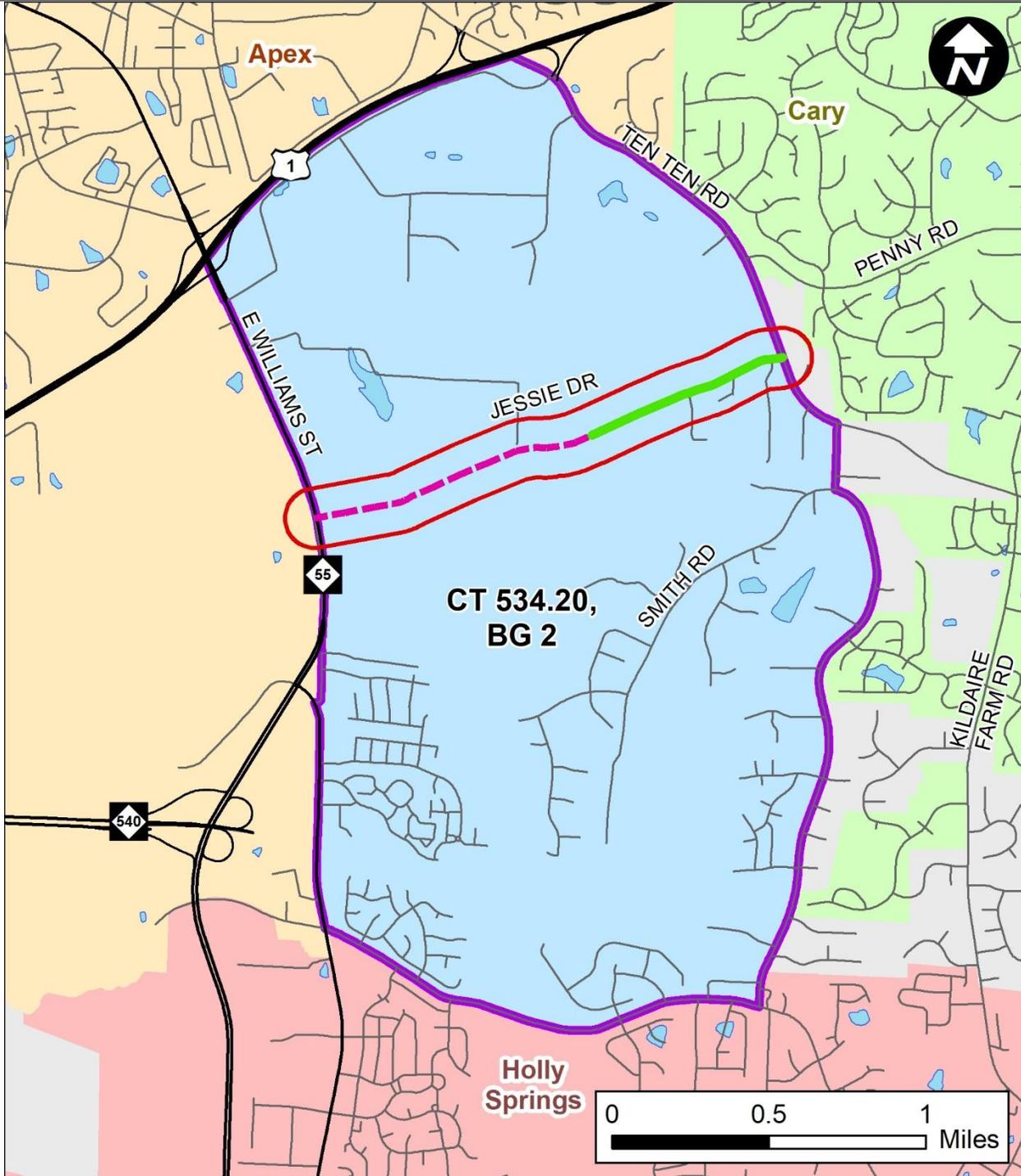
- The project may alter travel patterns, reduce travel time, affect access to properties in the area, or open areas for development or redevelopment. Due to the potential transportation impact-causing activities, this project may influence nearby land uses or stimulate growth. Therefore, a detailed indirect and cumulative effects study is recommended.



COMMUNITY CONTEXT MAP



DEMOGRAPHIC STUDY AREA



- | | |
|-------------------------------------|---------------------------|
| Direct Community Impact Area (DCIA) | Town of Apex ETJ |
| Existing Jessie Drive | Town of Cary ETJ |
| Proposed Jessie Drive Extension | Town of Holly Springs ETJ |
| Railroad | Wake County |
| Lakes and Ponds (NWI) | |



COMMUNITY CHARACTERISTICS, IMPACTS & RECOMMENDATIONS

<i>Community Resource</i>	<i>Presence</i>	
<p>RECREATIONAL RESOURCE(S) OR ACTIVITY</p> <p><u>Presence</u> <i>Are there any recreational resources, areas, or observed activities in the Direct Community Impact Area? If Federally-funded, are these potential 4(f) resources?</i></p>	<input type="checkbox"/> YES, SEPA Parks & Recreation <input type="checkbox"/> YES, NEPA potential 4(f); adjacent to/accessed from the project corridor <input type="checkbox"/> YES, NEPA potential 4(f); present in DCIA but not adjacent to or accessed from the project corridor <input checked="" type="checkbox"/> NO	
<p><u>Impacts</u></p>	<input type="checkbox"/> YES, SEPA Impact <input type="checkbox"/> YES, potential NEPA impact <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>SECTION 6(F) LAND & WATER CONSERVATION FUND RESOURCES</p> <p><u>Presence</u> <i>Are there any areas protected under Section 6(f) in the Direct Community Impact Area?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Impacts</u> <i>Is the project likely to impact identified Section 6(f) Land & Water Conservation Fund Resources?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>VOLUNTARY & ENHANCED VOLUNTARY AGRICULTURAL DISTRICTS [VAD/EVAD]</p> <p><u>Presence</u> <i>Is there a Voluntary Agricultural District or Enhanced Voluntary Agricultural District in the project footprint?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Impacts</u> <i>Is the project likely to impact designated Voluntary Agricultural Districts or Enhanced Voluntary Agricultural Districts?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>AGRICULTURAL RESOURCES AND ACTIVITY</p> <p><u>Presence</u> <i>Are there any active agricultural operations located in the Direct Community Impact Area? Is there any documented activity related to goods movement in the Direct Community Impact Area (e.g. farm or logging trucks, tractors, or other agricultural equipment)?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Impacts</u> <i>Is the project likely to impact identified agricultural operations?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	



<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>BICYCLE, PEDESTRIAN, AND/OR GREENWAY FACILITIES AND ACTIVE TRANSPORTATION</p> <p><u>Presence</u></p> <p><i>Are there existing bicycle, pedestrian, greenway or other active transport facilities located in the Direct Community Impact Area? Are there future plans for bicycle, pedestrian, greenway or active transport facilities to be located in the Direct Community Impact Area?</i></p> <p>Existing Facilities</p> <p>Sidewalk is located along both sides of NC 55 within the DCIA.</p> <p>The North Carolina Bike Route 5 or “Cape Fear Run” route is located along Ten Ten Road through the DCIA. There are currently no wide outside lanes or striped bicycle lanes on Ten Ten Road; however, there is one bike route sign located north of the DCIA that was observed in the field.</p> <p>Planned Facilities</p> <p>According to the Town of Apex’s <i>Parks & Greenways Map</i> and the <i>Wake County Greenway System Plan (2017)</i>, the Middle Creek Greenway is proposed to run north-south and cross Jessie Drive within the DCIA. A separate multi-use path is proposed to cross NC 55 to intersect with the proposed Middle Creek Greenway. According to the Town of Apex’s website, Middle Creek Greenway is listed as a high priority regional greenway connection and will be funded by a parks bond approved in 2017.</p> <p><i>Bike Apex</i> (January 2019), the Town’s bicycle plan, recommends side paths along both sides of Jessie Drive from Ten Ten Road to NC 55. Bicycle recommendations adjacent to this corridor include side path along Reliance Avenue/Production Drive extension, side path along both sides of NC 55, and bike lanes along Ten Ten Road.</p> <p><i>Advance Apex</i> (February 2019), the Town’s transportation plan, includes local bus routes along Jessie Drive, Ten Ten Road, and NC 55. Wake Transit Plans include a new route, HSX Holly Springs-Apex-Cary Express, which will provide service along NC 55, adjacent to this corridor. GoCary will operate this service and it is anticipated to begin operations January 2020.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p><u>Impacts</u></p> <p><i>Is the project likely to result in impacts to bicycle, pedestrian, and/or greenway facilities?</i></p> <p>Bicycle and pedestrian facilities are being considered as part of the proposed project, and if constructed, would connect to the existing sidewalks along NC 55 and existing NC Bike Route 5 along Ten Ten Road which will create connectivity and increased mobility within the Town of Apex.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
<p><u>Recommendation</u></p> <p>The Town of Apex Project Manager should coordinate with the Town of Apex Planning Department and NCDOT to evaluate the necessary level of bicycle and pedestrian accommodations for the proposed project. This should include along Jessie Drive, crossing Jessie Drive, and at the intersections with Ten Ten Road and NC 55.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p>BICYCLE/PEDESTRIAN ACTIVITY</p> <p><u>Presence</u></p> <p><i>Were bicyclists, pedestrians or worn paths observed in the Direct Community Impact Area?</i></p> <p>The local planner noted there are frequently pedestrians along NC 55, and bicyclists/ pedestrians along Ten Ten Road. These are thought to likely be commuting rather than recreational trips.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p><u>Impacts</u></p> <p><i>Is the project likely to result in impacts to bicycle or pedestrian activity?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	



<u>Recommendation</u>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
TRANSIT ROUTES, FACILITIES, AND/OR ACTIVITY <u>Presence</u> Are transit routes present in the Direct Community Impact Area? Were buses, transit stops or route signs observed on the site visit? Were any riders observed using or known to use these facilities? Were any of these riders special users?		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<u>Impacts</u> Is the project likely to result in impacts to transit routes, facilities, and/or activity?	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<u>Recommendation</u>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
LOCAL AREA PLANS, GOALS, AND DEVELOPMENT ACTIVITY <u>Presence</u> Are there any local area plans, goals, or zoning initiatives specifically affecting the Direct Community Impact Area (e.g. comprehensive plan; corridor or thoroughfare plan; small area plan; long-range growth plan; health impact assessment; etc.)? Has recent development activity occurred in the Direct Community Impact Area and/or are there known plans for public or private development activity in the Direct Community Impact Area?		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p><u>Local Plans</u></p> <p><i>Connect 2045, The Metropolitan Transportation Plan for the Capital Area Metropolitan Planning Organization</i> (February 2018), recommends Jessie Drive be built as a 2-lane road, then be widened to a four-lane, median divided roadway. The plan map also shows new local connector streets proposed to intersect Jessie Drive, including a future extension to the west to connect with the Veridea development.</p> <p>The Town of Apex's <i>Official Zoning Map</i> (amended March 5, 2019), indicates that the area surrounding the existing portion of Jessie Drive is currently residential land use and the Jessie Drive extension area is predominately light industrial with some residential use.</p> <p>The Town of Apex's <i>2045 Land Use Map</i> (adopted February 2018) shows the extended portion of the Jessie Drive is proposed to consist of "employment mixed use," with economic development potential estimated to be, but not limited to: office, warehousing, tech/flex, and some commercial. At the proposed intersection of NC 55 and Jessie Drive, a commercial area is shown on the land use map (proposed Jessie Commons). In the area along existing Jessie Drive where there is currently rural residential use, the land use map shows this changing to high density residential (townhomes and apartments), medium/high density residential (single-family homes and townhomes), and a mix of high density residential and office employment. Other changes include the designation of Knight's Play as Park-Public or Private, increased residential densities and mixed use opportunities near the future high school planned south of Jessie Drive, and mixed use opportunities at the southwest corner of the intersection of Jessie Drive and Ten Ten Road.</p> <p>In the <i>Peak Plan 2030, The Peak of Good Living, The Apex Comprehensive Plan</i> (2013), the plan recommends that the access and visibility of large parcels that could be developed as employment centers or mixed-use communities on key transportation corridors such as NC 55 and Jessie Drive should be preserved, and that new industrial/business/office park sites totaling 100-150 contiguous acres on NC 55 and Jessie Drive should be identified to accommodate non-retail employment growth.</p> <p>The Apex <i>Transit Plan Map</i> shows a future local bus route along Jessie Drive.</p>		



<p>Future Jessie Drive has been identified as a Strategic Freight Corridor in regional and local plans.</p> <p><u>Development Potential</u></p> <p>According to the Town of Apex’s <i>Interactive Development Map</i>, the Horton Park development is proposed along the south side of Jessie Drive, near the current dead end of Jessie Drive and includes up to 323 single family units, 270 townhomes, and 314 apartments with additional commercial and industrial/office employment use. Another development, Jessie Commons, is proposed adjacent to, and to the right of, NC 55, where the Jessie Drive extension would intersect with NC 55. The development would consist of approximately 64 acres of commercial and office/industrial space.</p> <p>The Horton Park development would also include improvement of the existing section of Jessie Drive and a short segment of the extension. These roadway improvements will be completed prior to the construction of the Town of Apex’s Jessie Drive improvements, which will complete the Jessie Drive extension and improvement project.</p>		
<p><u>Impacts</u></p> <p><i>Is the project consistent or not consistent with existing plans, regulations, and policies at the local, regional, or state level?</i></p>	<input checked="" type="checkbox"/> CONSISTENT <input type="checkbox"/> NOT CONSISTENT	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>DRIVEWAYS AND CROSS STREETS</p> <p><u>Presence</u></p> <p><i>Are there any driveways or intersections located along the project corridor?</i></p> <p>Jessie Drive currently intersects with Ten Ten Road, Sweetgum Drive, Wrenns Nest Drive, and Hurdoover Road. Wrenns Nest Drive and Hurdoover Road are both gravel roads.</p> <p>Along Jessie Drive, there are seven paved residential, one unpaved business, and eight unpaved residential driveways.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p><u>Impacts</u></p> <p><i>Is the project likely to result in access or accessibility impacts to driveways and cross streets?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>BUSINESS AND ECONOMIC RESOURCES AND TRANSPORTATION ACTIVITY</p> <p><u>Presence</u></p> <p><i>Are any specific business and/or economic resources present in the Direct Community Impact Area (e.g. business parks or districts, distribution centers, manufacturing facilities, etc.)? Is there any documented activity related to goods movement in the Direct Community Impact Area (e.g. tractor- trailers, or industrial traffic)?</i></p> <p>It is anticipated that the Jessie Drive extension will attract industrial traffic. Two light industrial facilities are within the DCIA, and others are adjacent to the DCIA or in the nearby area.</p> <p>Kenan Transport is located along the west side of NC 55 and uses tractor trailers for delivery of propane gas. Elite Waste Services, a dumpster rental service, is located on the north side of the DCIA; tractor trailers are used to deliver the dumpster from the Elite Waste Services site to the customer.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p><u>Impacts</u></p> <p><i>Is the project likely to result in impacts to business and economic resources?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES



	<input checked="" type="checkbox"/> NO	
<p>EMERGENCY MANAGEMENT SERVICES (EMS) OPERATIONS</p> <p><u>Presence</u></p> <p><i>Did the EMS local official note any emergency services operations within the Direct Community Impact Area that may be affected by the project, such as stations or corridors that are primary response routes?</i></p> <p>The Apex Police Department, Apex Fire Department, and Wake County Emergency Medical Services (WCEMS) were interviewed for any concerns relative to the proposed project. Overall, the feedback provided was that annexed areas in the vicinity of the Jessie Drive corridor, which include Colvin Park (between Smith Road and Stephenson Road) and future Horton Park (south of Jessie Drive and west of Smith Road), receive emergency services from the Town of Apex, but these areas are difficult to access. NC 55 is a busy corridor for emergency response. Currently, the Town of Cary Fire Station 6 (at Kildaire Farm Road and Ten Ten Road) is the assigned first responder to this area. Once Jessie Drive is complete, WCEMS located at the Town of Apex Fire Station 4 will respond to the area instead; thereby, reducing response times.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NO RESPONSE	
<p><u>Impacts</u></p> <p><i>As checked on Local EMS Input Form</i></p> <p>The widening and extension of Jessie Drive will substantially improve connectivity to the annexed areas in the vicinity of the Jessie Drive corridor, and therefore, reduce response times, increase the level of emergency service to Apex customers, and improve health, safety, and wellbeing in the community.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NO RESPONSE	
<p><u>Recommendation</u></p> <p>The Town of Apex Project Manager should ensure that the design of Jessie Drive and its intersections with NC 55 and Ten Ten Road provide adequate turning radii and access for emergency vehicles, right-in/right out access, and reduces the amount of left-turn movements, four-way stops, and direct access to residential driveways to the extent practicable.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
<p>SCHOOL BUS ROUTES</p> <p><u>Presence</u></p> <p><i>Did the local school transportation official note any school bus routes within the Direct Community Impact Area that may be affected by the project?</i></p> <p>According to Wake County Public School System (WCPSS), there are no existing bus trips or carpool traffic on Jessie Drive. A new high school is planned south of Jessie Drive with the main point of access likely from the east via Stephenson Road.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NO RESPONSE	
<p><u>Impacts</u></p> <p><i>As checked on Local Schools Input Form</i></p> <p>The widening and extension of Jessie Drive will be a benefit to the WCPSS by providing an alternative route for school bus service in the area versus using NC 55, Ten Ten Road, or Lufkin Road. The only potential concern per WCPSS is during construction when Jessie Drive is tied into NC 55, but WCPSS anticipates that this will be considered further during design.</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> NO RESPONSE	
<p><u>Recommendation</u></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p>COMMUNITY RESOURCES</p> <p><u>Presence</u></p> <p><i>Are there any notable community resources located in the Direct Community Impact Area, including places of worship; private and/or public schools; adult education and/or training facilities; daycares; cemeteries; private or public social service agencies; government facilities; other important destinations or resources for local residents?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	



<p>Impacts <i>Is the project likely to impact identified community resources, either directly or by affecting user access?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p>Recommendation</p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>COMMUNITY COHESION Presence <i>Were any specific signs or indicators of community cohesion observed / found within the Direct Community Impact Area?</i></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>Impacts <i>Is the project likely to alter the overall functioning of an identifiable district (e.g. interactions between, or isolation of, persons and groups; or change in the physical makeup of the community)? Is the project likely to disrupt connections between neighborhoods and commercial, recreational, institutional and employment facilities and/or areas?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p>Recommendation</p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>COMMUNITY HEALTH AND SAFETY Presence <i>Are there any existing or perceived crime or safety issues in the Direct Community Impact Area, including unsafe bicycle or pedestrian facilities, inadequate lighting and/or isolated or poorly connected areas?</i></p> <p>Both the bicycle and pedestrian crash rates for Wake County are higher than the rates for North Carolina. The bicycle crash rate in Wake County is 1.44 in comparison to North Carolina’s rate of 1.03, and the pedestrian crash rate in Wake County is 3.04 versus 2.77 for the state. However, there were no bicycle crashes and only one pedestrian crash recorded within the DCIA between 2007 and 2012 which occurred on Ten Ten Road approximately 0.1 mile north of existing Jessie Drive near Knight’s Play Golf Course.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
<p>Impacts <i>Is the project likely to change any existing or perceived crime or safety issues?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p>Recommendation</p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>AREA/COMMUNITY CONCERNS Presence <i>Are there any known community concerns or controversy relative to the project? If concerns were voiced during Public Involvement activities, please attach the relevant comment sheets or meeting comment summary in the Appendix.</i></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>Impacts <i>Is the project likely to be incompatible with or not address community concerns?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p>Recommendation</p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>OTHER IMPACTS <i>Are there any other potential impacts associated with the project?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	



<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>RECURRING EFFECTS</p> <p><u>Impacts</u></p> <p><i>Is the project likely to result in recurring effects on any populations and communities within the Direct Community Impact Area?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
<p><u>Recommendation</u></p>		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
<p>ENVIRONMENTAL JUSTICE (EJ) AND TITLE VI POPULATIONS</p> <p><u>Presence</u></p> <p><i>Are there any populations living in the Demographic Study Area that meet the criteria for Environmental Justice and/or Title VI? If so, note which groups are present (check all that apply):</i></p> <p><input type="checkbox"/> Minority <input checked="" type="checkbox"/> Low-Income <input type="checkbox"/> Title VI (non-EJ)</p> <p>While Census data does not indicate a notable presence of populations meeting the criteria for Environmental Justice or protected by Title VI and related statutes within the Demographic Study Area (DSA), low-income communities were observed within the Direct Community Impact Area (DCIA) during the field visit.</p> <p>Census Tract 534.20, Block Group 2 has a Near Poor population of 11.8% which is 4.9% more than Wake County’s Near Poor population of 6.9%. There are approximately six mobile homes, indicative of low-income populations, located on Jessie Drive.</p> <p>Just outside of the DCIA, the local planner noted a presence of low-income and minority populations near NC 55 along Bobbitt Road, along Ten Ten Road, and along Smith Road. The local planner observed that restaurants and services along NC 55 are frequently used by minority and low-income populations in the vicinity of the project. Several churches in the area may serve these populations.</p>		<input type="checkbox"/> Not present according to Census data and observation/local input <input type="checkbox"/> Present ; Census data indicates presence but there is no observation/local input to confirm <input checked="" type="checkbox"/> Present ; Census data does not indicate presence but communities were observed <input type="checkbox"/> Present according to Census and communities were observed
<p><u>Impacts</u></p> <p><i>Is the project likely to have a disproportionately high and adverse impact, including denial of benefits, on identified Environmental Justice and/or Title VI populations in the Direct Community Impact Area?</i></p> <p>Notably adverse community impacts are anticipated with this project but appear to affect all populations equivalently; thus, impacts to minority and low-income populations do not appear to be disproportionately high and adverse. Benefits and burdens resulting from the project are anticipated to be equitably distributed throughout the community. No disparate impacts are anticipated under Title VI and related statutes.</p> <p>Additional right-of-way or easements are likely to be required from the properties along Jessie Drive where mobile homes are located. These homes are located at least 90 feet from the existing roadway edge of pavement. Therefore, the initial two-lane may not require relocations, but the ultimate 4-lane design may. These mobile homes may be affected by the improvements that will be constructed as part of the Horton Park development prior to the Town’s project.</p>		<input type="checkbox"/> No impacts ; no EJ or Title VI population present <input type="checkbox"/> No impacts ; EJ and/or Title VI population present <input type="checkbox"/> Community Impacts ; no EJ or Title VI population present <input checked="" type="checkbox"/> Impacts ; EJ and/or Title VI population present; “No” finding <input type="checkbox"/> Impacts ; EJ and/or Title VI population present; “Yes” finding
<p><u>Recommendation</u></p> <p>Public involvement and outreach activities must ensure full and fair participation of all potentially affected communities in the transportation decision-making process.</p>		<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO



<p>LIMITED ENGLISH PROFICIENCY [LEP] OR LANGUAGE ASSISTANCE [LA] POPULATIONS</p> <p><u>Presence</u></p> <p><i>Are there any populations living in the Demographic Study Area that meet the criteria for Limited English Proficiency? Are there any populations within the Demographic Study Area that do not meet the LEP threshold but do meet the criteria for Language Assistance?</i></p> <p>Census data indicates a Spanish language-speaking population that meets or exceeds the U.S. Department of Justice Limited English Proficiency (LEP) Safe Harbor threshold within the Demographic Study Area.</p> <p>The DSA has a Spanish language-speaking population of 9.0% consisting of more than 50 adults (271 adults). The local planner noted that restaurants and services along NC 55 are frequently used by LEP populations in the vicinity of the project.</p>	<p><input type="checkbox"/> No LEP or LA</p> <p><input type="checkbox"/> No LEP, but LA population is present</p> <p><input checked="" type="checkbox"/> LEP population present</p> <p><input type="checkbox"/> [and LA population present]</p>
<p><u>Recommendation</u></p> <p>Because LEP populations within the DSA exceed the Department of Justice's Safe Harbor thresholds, written translations of vital documents should be provided for Spanish language-speaking populations, in addition to other measures assuring meaningful language access, as determined by NCDOT Public Involvement to satisfy the requirements of Executive Order 13166.</p>	<p><input checked="" type="checkbox"/> YES</p> <p><input type="checkbox"/> NO</p>

ADDITIONAL COMMUNITY CHARACTERISTICS

<p>NOTABLE POPULATION GROWTH OR DECLINE</p> <p><u>Presence</u></p> <p><i>Has the DSA experienced notable population growth or decline in recent years? If the average annualized DSA population growth is higher than 1.5%, note the growth in the county and how it compares.</i></p> <p><input type="checkbox"/> Decline <input checked="" type="checkbox"/> Greater than 1.5% annual growth (in DSA)</p> <p>Based on U.S. Census population data, notable population growth occurred within the DSA between 2000 and 2010. The average annualized population growth within the DSA during this time period was 13.3% in comparison to Wake County's growth of 3.7% during that same time period.</p> <p>This growth is expected to continue consistent with local plans. There are several plans for development along and adjacent to the corridor: Jessie Commons (commercial site at the corner of NC 55 and Jessie Drive extension: preliminary layout plan submitted, interested in Jessie Drive project as a consideration of timing for moving forward), Elite Waste Services (north side of Jessie Drive near NC 55: under construction), and Horton Park Pods 5-8 (residential development south of Jessie Drive near the existing western terminus: site plan approved, construction plan under review).</p> <p>A number of rezonings have been approved or are pending approval along and adjacent to this corridor, including for Veridea, a mixed-use development west of NC 55 with access at the future NC 55/Jessie Drive Extension intersection. The Cash Corporate Center, located at 2100 Production Drive, has been rezoned to Light Industrial – Conditional Zoning (LI-CZ) to accommodate future development.</p>	<p><input checked="" type="checkbox"/> YES</p> <p><input type="checkbox"/> NO</p>
<p>STIP PROJECTS</p> <p><u>Presence</u></p> <p><i>Are there any reasonably foreseeable STIP projects within 3 miles of this project and/or that have the potential to affect or be affected by this project?</i></p> <p>There are ten STIP projects located within three miles of the proposed project and are as follows (dates are from the current approved 2018-2028 STIP):</p> <ul style="list-style-type: none"> • EB-5893: Construct Greenway along Swift Creek from SR 1521 (Lake Pine Drive) to Koka Booth Amphitheater in Cary; Preliminary Engineering (PE) FY 2021; ROW FY 2023; CN FY 2025 	<p><input checked="" type="checkbox"/> YES</p> <p><input type="checkbox"/> NO</p>



<ul style="list-style-type: none"> • EB-5895: Construct Sidewalk on NC 55 (East Williams Street) from SR 1301 (Sunset Lake Road) in Holly Springs to NC 55 in Apex; CN FY 2019 • R-2721: Freeway on New Location (Future NC 540) Southern Wake Freeway/Triangle Expressway Southeast Extension (Raleigh Outer Loop) from NC 55 (South) to US 401 South; ROW FY 2019; CN FY 2019 • U-2901B: Convert Existing Multi-lanes to Median Divided Section and Widen Remaining 2-Lane Sections to Multi-lanes on NC 55 from US 1 to North of SR 1160 (Olive Chapel Road); Right of way (ROW) FY 2019; CN Fiscal Year 2021 • U-5301: Corridor Upgrade and Improvements for US 64 from West of SR 1308 (Laura Duncan Road) to US 1 in Apex and Cary; ROW FY 2020; CN FY 2022 • U-5530 AC: Complete a Pedestrian Route from South of James Street to Downtown Apex; Improve Pedestrian Infrastructure Along Apex’s Historic Main Street • U-5537: Widen SR 1521 (Lake Pine Drive) to Three Lanes from North of MacGregor Pines Road to North of Versailles Drive including a 10-foot Multiuse Path on the East Side and a 5-foot Sidewalk on the West Side; CN FY 2018 • U-5825A: Widen SR 1010 (Ten Ten Road) to Multi-lanes from Apex Peakway to US 1 in Apex; ROW FY 2021; CN FY 2023 • U-5928: Construct Grade Separated Interchange for Apex Peakway at South Salem Street and CSX RR from James Street to Towhee Drive; Construction (CN) Fiscal Year (FY) 2018 • U-5981: Improve NC 55 Interchange in Apex and upgrade NC 55 Northbound from SR 1444 (Lufkin Road) to US 1; ROW FY 2024; CN FY 2026 • U-6066: Add Lanes on NC 55 in Apex to US 64 in Cary; ROW FY 2024; CN FY 2026 • U-6101: Convert Facilities to Managed Freeways, to Include Ramp Metering on US 1/US 64; I-440; I-87; I-40; Programmed for Planning and Environmental Study Only (In Progress) 	
---	--

<p>TRAFFIC GENERATING FACILITY OR NODE</p> <p><u>Presence</u></p> <p><i>Is there a node or facility that generates a notable level of vehicular or pedestrian traffic in the Direct Community Impact Area?</i></p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
---	--

ADDITIONAL RECOMMENDATIONS

<p>EVALUATE ALTERNATIVE(S) THAT UTILIZE A TEMPORARY ON-SITE DETOUR</p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
---	--

<p>EVALUATE ALTERNATIVE CONSTRUCTION WORK SCHEDULES</p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
--	--

<p>OTHER RECOMMENDATIONS</p>	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
-------------------------------------	--

Indirect and Cumulative Effects [Transportation Impact-Causing Activities (TICAs)]

<p>TRAVEL TIMES</p> <p><i>Will the project result in travel time savings of more than one minute?</i></p> <p>The shortest existing route to get from the Jessie Drive/Ten Ten Road intersection to the proposed location of the extended Jessie Drive/NC 55 intersection is along Ten Ten Road, US 1, and NC 55. This route consists of six signals and takes approximately 10.5 minutes.</p> <p>With the proposed project, the extension of Jessie Drive would connect Ten Ten Road to NC 55 and take approximately 3 minutes which is a travel time savings of approximately 7.5 minutes. It was assumed that a traffic signal would be required at the end of Jessie</p>	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
--	--



<p>Drive for the constructed intersection with NC 55. Each traffic signal was assumed to have a 1-minute delay in travel time.</p>	
<p>NEW NETWORK CONNECTIONS <i>Will the project permanently add to the existing road network (i.e. new connections, intersection-to-interchange conversions or service roads)?</i></p> <p>Jessie Drive will be extended west to NC 55, creating the Jessie Drive/NC 55 intersection and connecting NC 55 to Ten Ten Road which will provide an additional east-west route within the Town of Apex. As part of this project, Jessie Drive may potentially be widened to a four-lane roadway.</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>PROPERTY ACCESS <i>Will the project provide new or expanded access to properties?</i></p> <p>With the connection of NC 55 to Ten Ten Road, additional traffic is anticipated to utilize Jessie Drive which will route through traffic through the existing residential area along Jessie Drive; thereby, increasing exposure to these properties. The existing access from residences to Jessie Drive may potentially be affected as well if a four-lane alternative is chosen. Extending Jessie Drive will also open up access to properties not currently served by a local roadway.</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>CREATION OF ACTIVITY CENTERS <i>Will the project open areas for concentrated, moderate to high intensity land development or redevelopment?</i></p> <p>Because access will be provided to properties not currently served by a local roadway, and due to the connection between NC 55 and Ten Ten Road which is proposed through several undeveloped properties, there is potential for a concentration of new development to occur in this area, creating an activity center.</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>
<p>TICA SUMMARY <i>Will the project result in one or more transportation impact-causing activities?</i></p> <p>The project may alter travel patterns, reduce travel time, affect access to properties in the area, or open areas for development or redevelopment.</p>	<p><input type="checkbox"/> Absence of TICAs <input checked="" type="checkbox"/> Presence of TICAs</p>
<p>INDIRECT AND CUMULATIVE EFFECTS STATEMENT <i>Will the project require completion of the ICE screening tool?</i></p> <p>Due to the potential transportation impact-causing activities, this project may influence nearby land uses or stimulate growth. Therefore, a detailed indirect and cumulative effects study is recommended.</p>	<p><input checked="" type="checkbox"/> YES <input type="checkbox"/> NO</p>

SOURCES

Advance Apex (February 2019), <http://www.apexnc.org/1193/Advance-Apex>

Apex Development site, <http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795>

Apex Land Use Map (February 2018), [Advance Apex: The 2045 Land Use Map Update](#) and [2045 Land Use Map](#)

Apex Fire Department, Chief Keith McGee, personal communication

Apex Parks, Recreation, Greenways, and Open Space Master Plan (2013), <https://www.apexnc.org/DocumentCenter/View/1050/Parks-Recreation-Greenways--Open-Space-Master-Plan?bidId=>

Apex Parks, Recreation, Greenways, and Open Space Master Plan Map (Revised 2016), <https://www.apexnc.org/DocumentCenter/View/9268/ParksRecMasterPlan22316?bidId=>

Apex Parks & Greenways Map, <https://www.apexnc.org/DocumentCenter/View/1046/Printable-Facilities--Greenways-Map?bidId=>



Apex Police Department, Chief John Letteney, personal communication

Apex Transit Plan Map, <https://www.apexnc.org/DocumentCenter/View/488/Transportation-Plan---Transit-Plan-Map-PDF?bidId=>

Apex Transportation Plan (2011), <https://www.apexnc.org/DocumentCenter/View/413/Transportation-Plan---Complete-Documnet?bidId=>

Apex Transportation Plan, Bicycle, Pedestrian, and Equestrian Plan map (amended March 2018), <https://www.apexnc.org/DocumentCenter/View/486/Transportation-Plan---Pedestrian-Plan-Map-PDF?bidId=>

Apex Transportation Plan, Thoroughfare and Collector Street Plan map (adopted February 2019), <https://www.apexnc.org/DocumentCenter/View/487/Transportation-Plan---Thoroughfare-and-Collector-Street-Plan-Map-PDF?bidId=>

Bike Apex (January 2019), <http://www.apexnc.org/1250/Bike-Apex>

Connect 2045, The Metropolitan Transportation Plan for the Capital Area Metropolitan Planning Organization (February 2018), http://files.www.campanc.us/transportation-plan/draft-2045-metropolitan-transportation-plan/Final_Report/Connect2045_MTP_v2_021918.full.pdf

Horton Park Zoning Petition, http://www.apexnc.org/DocumentCenter/View/21495/18CZ04HortonPark_Ordinance?bidId=

Middle Creek Greenway, <http://www.apexnc.org/1165/Middle-Creek-Greenway>

Official Zoning District Map, Town of Apex (amended March 8, 2019), <https://www.apexnc.org/DocumentCenter/View/493/Zoning-Map-PDF?bidId=>

Peak Plan 2030, The Peak of Good Living, The Apex Comprehensive Plan (2013), <https://www.apexnc.org/DocumentCenter/View/494/Peak-Plan-2030-PDF?bidId=>

Town of Apex Interactive Development Map, <http://www.arcgis.com/home/webmap/viewer.html?webmap=1dc2542dc4454f6f8c56ffca7a2d554d&extent=-78.9637,35.6827,-78.798,35.7856>

Wake County Collector Street Plan (2004), <http://www.wakegov.com/planning/transport/Documents/WakeCountyCollectorStreetReport.pdf>

Wake County Emergency Medical Services, Chief John Olson, personal communication

Wake County Greenway System Plan (2017), <http://www.wakegov.com/parks/about/Pages/masterplan.aspx>

Wake County Public School System, Senior Administrator, Transportation, Stephen Sposato, personal communication

Wake County Transportation Plan (2003), <http://www.wakegov.com/planning/transport/Documents/Wake%20County%20Transportation%20Plan.pdf>

Wake Transit Plan (2016), http://goforwardnc.org/wp-content/uploads/2018/03/November-2016-Wake-Transit-Plan_small.pdf

2045 Land Use Map, Town of Apex (adopted February 5, 2019), <https://www.apexnc.org/DocumentCenter/View/478/2030-Land-Use-Map-PDF?bidId=>

APPENDIX ITEMS

- A. Summary of Demographics Used in Tabular Form
- B. Site Photographs
- C. Local Official Input Forms
- D. Health Indicators Table



APPENDIX A: SUMMARY OF DEMOGRAPHICS USED IN TABULAR FORM

Minority

Geography	Total Population	White, Non-Hispanic		Minority Population*	
		#	%	#	%
CT 534.2, BG 2	4,509	2,363	52.4%	2,146	47.6%
DSA	4,509	2,363	52.4%	2,146	47.6%
Wake County	1,023,811	620,364	60.6%	403,447	39.4%

* Minority population includes all races that are Non-White and Hispanic populations that are also White.

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table B03002, "Hispanic or Latino Origin by Race."

Race

Geography	Total Population	White		Black or African American		American Indian and Alaska Native Alone		Asian		Native Hawaiian/Pacific Islander		Some Other Race		Two or More Races		Total Non-White	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
CT 534.2, BG 2	4,509	2,718	60.3%	764	16.9%	-	0.0%	421	9.3%	-	0.0%	447	9.9%	159	3.5%	1,791	39.7%
DSA	4,509	2,718	60.3%	764	16.9%	-	0.0%	421	9.3%	-	0.0%	447	9.9%	159	3.5%	1,791	39.7%
Wake County	1,023,811	680,511	66.5%	208,642	20.4%	3,586	0.4%	66,210	6.5%	413	0.0%	36,588	3.6%	27,861	2.7%	343,300	33.5%

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table B02001, "Race."



Hispanic or Latino Population

Hispanic or Latino Origin	Total Population	Hispanic		Not Hispanic	
		#	%	#	%
CT 534.2, BG 2	4,509	802	17.8%	3,707	82.2%
DSA	4,509	802	17.8%	3,707	82.2%
Wake County	1,023,811	102,537	10.0%	921,274	90.0%

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table B03002, "Hispanic or Latino Origin by Race."

Poverty

Poverty	Total Population for whom Poverty Status is Determined	Below Poverty Level		Very Poor: Under 50% of Poverty Level		Near Poor: Between 100% and 149% of Poverty Level	
		#	%	#	%	#	%
CT 534.2, BG 2	4,461	280	6.3%	114	2.6%	525	11.8%
DSA	4,461	280	6.3%	114	2.6%	525	11.8%
Wake County	1,001,332	101,256	10.1%	43,834	4.4%	69,223	6.9%

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table C17002, "Ratio of Income to Poverty Level in the Past 12 Months."

Zero-Car Households

Geography	Total Households	No Vehicle Available		One Vehicle Available		Two or More Vehicles Available	
		#	%	#	%	#	%
CT 534.2, BG 2	1,620	13	0.8%	358	22.1%	1,249	77.1%
DSA	1,620	13	0.8%	358	22.1%	1,249	77.1%
Wake County	381,971	15,618	4.1%	118,692	31.1%	247,661	64.8%

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table B25044, "Tenure by Vehicles Available."



Limited English Proficiency

Geography	Total Adult Population, 18 years and older	Primary Language Group of Persons Who Speak English Less than Very Well							
		Spanish		Other Indo-Euro		Asian/Pacific		Other	
		#	%	#	%	#	%	#	%
CT 534.2, BG 2	3,011	271	9.0%	-	0.0%	-	0.0%	33	1.1%
DSA	3,011	271	9.0%	-	0.0%	-	0.0%	33	1.1%

Source: US Census Bureau, American Community Survey 5-year Estimates (2013-2017), Table B16004, "Age by Language Spoken at Home by Ability to Speak English for the Population 5 Years and Over."

Population Change, 2000 to 2010

Geography 2010	Census 2000 Population	Census 2010 Population	Difference	Percent Change	Annualized Growth Rate
CT 534.2, BG 2	1,168	4,064	2,896	247.9%	13.3%
DSA	1,168	4,064	2,896	247.9%	13.3%
Wake County	627,779	900,993	273,214	43.5%	3.7%
North Carolina	8,049,313	9,535,483	1,486,170	18.5%	1.7%

Source: Steven Manson, Jonathan Schroeder, David Van Riper, and Steven Ruggles. IPUMS National Historical Geographic Information System: Version 13.0 [Database]. Minneapolis: University of Minnesota. 2018. <http://doi.org/10.18128/D050.V13.0> Census 2000/Census 2010 Time Series Tables Geographically Standardized



APPENDIX B: SITE PHOTOGRAPHS



Figure 1: View northwest along Ten Ten Road towards the Jessie Drive intersection



Figure 2: View of the Knights Play Golf Center



Figure 3: View southeast along Jessie Drive of mobile homes



Figure 4: View southeast along Jessie Drive of an older home and mobile home



Figure 5: View northeast along Jessie Drive



Figure 6: View northwest along NC 55 in the vicinity of the proposed intersection with extended Jessie Drive

APPENDIX C: LOCAL OFFICIAL INPUT FORMS

LOCAL EMS

Name:	John Olson	
Title:	Chief	
Agency:	Wake County Emergency Medical Services	
Phone:	(919) 856-6022	
Email:	Jon.olson@wakegov.com	
FIRST CONTACT DATE	METHOD(S)	RESULT
August 21, 2018	<input type="checkbox"/> Email <input checked="" type="checkbox"/> Phone <input type="checkbox"/> In-person	<input type="checkbox"/> Form returned on (date) <input checked="" type="checkbox"/> Interview on 8/21/18 <input type="checkbox"/> No response Comments:

Name:	Keith McGee	
Title:	Chief	
Agency:	Apex Fire Department	
Phone:	(919) 362-4001	
Email:	Keith.mcgee@apexnc.org	
FIRST CONTACT DATE	METHOD(S)	RESULT
August 21, 2018	<input type="checkbox"/> Email <input checked="" type="checkbox"/> Phone <input type="checkbox"/> In-person	<input type="checkbox"/> Form returned on (date) <input checked="" type="checkbox"/> Interview on 8/21/18 <input type="checkbox"/> No response Comments:

Name:	John W. Letteney	
Title:	Chief	
Agency:	Apex Police Department	
Phone:	(919) 249-3447	
Email:	John.letteney@apexnc.org	
FIRST CONTACT DATE	METHOD(S)	RESULT
August 21, 2018	<input type="checkbox"/> Email <input checked="" type="checkbox"/> Phone <input type="checkbox"/> In-person	<input type="checkbox"/> Form returned on (date) <input checked="" type="checkbox"/> Interview on 8/21/18 <input type="checkbox"/> No response Comments:

LOCAL PLANNER

Name:	Jenna Shouse	
Title:	Long Range Planner	
Agency:	Town of Apex	
Phone:	(919) 372-7509	
Email:	Jenna.shouse@apexnc.org	
FIRST CONTACT DATE	METHOD	RESULT
March 11, 2019	<input type="checkbox"/> Email	<input checked="" type="checkbox"/> Form returned on 3/26/19



	<input type="checkbox"/> Phone <input checked="" type="checkbox"/> In-person	<input type="checkbox"/> Interview on (date) <input type="checkbox"/> No response Comments:
--	---	---

LOCAL SCHOOLS

Name:	Stephen Sposato	
Title:	Senior Administrator, Transportation	
Agency:	Wake County Public School System	
Phone:	(919) 533-7821	
Email:	Ssposato2@wcpss.net	
FIRST CONTACT DATE	METHOD	RESULT
August 16, 2018	<input type="checkbox"/> Email <input checked="" type="checkbox"/> Phone <input type="checkbox"/> In-person	<input type="checkbox"/> Form returned on (date) <input checked="" type="checkbox"/> Interview on 8/16/18 <input type="checkbox"/> No response Comments:



Local EMS Input Form

NC Department of Transportation Community Studies Group, Human Environment Section Local Emergency Responders Input Form for JESSIE DRIVE IMPROVEMENTS AND EXTENSION PROJECT FEASIBILITY STUDY COMMUNITY CHARACTERISTICS REPORT	
Contact Information	
Interviewee Name: Prepared by Jenna Shouse with input from: Chief John Letteney (Police), Chief Keith McGee (Fire), and Chief John Olson (Wake County EMS)	Date: August 21, 2018 Phone Number: (919) 372-7509
Title/Position: Organization/Agency: Town of Apex	Completed Via: <input type="checkbox"/> Email <input type="checkbox"/> Phone
Email: Jenna.Shouse@apexnc.org	
For all applicable questions, please provide a detailed explanation of your response in the field provided.	Check if item is applicable
1. Are there any concerns related to emergency services for this project? Please be as specific as possible (e.g. location in a high call volume area, closure could affect response to schools, weight restrictions, expected new development in the area, coordination with partner agency required to facilitate service). <i>There are no concerns related to emergency services for this project.</i>	<input checked="" type="checkbox"/>
2. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes travelers are likely to use to detour around the project area during construction, or the location of resources along these routes? <i>Not applicable</i>	<input type="checkbox"/>
3. Are there any future time periods or events that you know of where reduction in number of lanes for construction would be of particular concern? <i>Not applicable</i>	<input type="checkbox"/>
4. Rate the overall impact on emergency services if the roadway were at reduced capacity for up to a year: <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact <i>Not applicable</i>	
5. Are road names referenced by the names locals would use? <i>Yes</i>	<input checked="" type="checkbox"/>
6. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? <i>No</i>	<input checked="" type="checkbox"/>
7. Do you have any other concerns regarding the potential impact of this project on emergency services, or any additional comments? Please be as specific as possible. <i>Overall</i> <ul style="list-style-type: none"> • <i>Annexed areas in the vicinity of the Jessie Drive Corridor, including Colvin Park (between Smith Road and Stephenson Road) and future Horton Park (south of Jessie Drive and west of Smith Road), receive emergency services from the Town but are difficult to access.</i> 	<input checked="" type="checkbox"/>



- *Jessie Drive will substantially improve connectivity to this area and therefore reduce response times, increase the level of emergency service to Apex customers, and improve health, safety, and wellbeing.*

Apex Police Department:

- *The Police Department does not respond to emergencies from a fixed location, rather the nearest officers will respond. The NC 55 corridor between US 1 and Technology Drive is a busy road segment for the Police Department and typically, the nearest officers to the Colvin Park/Horton Park area would be along this corridor. There is not a direct route from NC 55 to Colvin Park and future Horton Park subdivisions. The Police Department is receiving more calls in this area. Jessie Drive will improve response times.*
- *An important petroleum resource to the region, the Dixie Pipeline, is located along NC 55 just north of future Jessie Drive. NC 55 has been shut down for incidents related to the pipeline in the past. Jessie Drive would provide an alternative route in these situations.*
- *The Police Department prefers signalized and right-in/right-out intersections. Reducing left-turn movements reduces traffic incidents.*
- *The Police Department requests four-way stops and direct access by residential driveways are avoided on Jessie Drive.*

Apex Fire Department:

- *The Town is responsible for service to Colvin Park and future Horton Park and there is not a direct route to these subdivisions. The Jessie Drive project would likely cut response time in half. The Fire Department suggests using Network Analyst in GIS to compare travel times to Colvin Park or other area destination with and without Jessie Drive.*
- *Jessie Drive would allow increased service coverage area and expedite service – allowing Apex citizens in the vicinity to receive a more equitable level of service than they do today.*
- *The Fire Department requests that ingress and egress between Jessie Drive and NC 55 and Jessie Drive and Ten Ten Road are well planned for fuel tanker trucks.*

Wake County EMS:

- *Wake County is responsible for service in this area.*
- *Wake County EMS at Town of Cary Fire Station 6 (Kildaire Farm Road and Ten Ten Road) are the assigned first responders to this area.*
- *In the future, when the Jessie Drive project is complete, Wake County EMS at Town of Apex Fire Station 4 will respond to this area – reducing response times.*



Local Planner Input Form

**NC Department of Transportation Community Studies Group, Human Environment Section
Local Planner Input Form for
JESSIE DRIVE COMMUNITY CHARACTERISTICS REPORT**

Contact Information

Interviewee Name: Jenna Shouse Date: March 26, 2019
 Title/Position: Long Range Planner Phone Number: 919-372-7509
 Organization/Agency: Town of Apex
 Email: jenna.shouse@apexnc.org Completed Via: Email Phone

Check those questions that apply and provide a detailed explanation of your response in the field provided.

Check if item is applicable

Growth and Development

1.
The Town of Apex is quickly growing. Development proposals are available on our interactive map at the following URL:
<http://apexnc.maps.arcgis.com/apps/OnePane/basicviewer/index.html?appid=fa9ba2017b784030b15ef4da27d9e795>
There are several plans for development along and adjacent to this corridor. The current status of the following projects follows: Jessie Commons (preliminary layout plan submitted, interested in Jessie Drive project as a consideration of timing for moving forward), Elite Waste Services (under construction), Horton Park Pods 5-8 (site plan approved, construction plan under review), Stop N Go #5 (proposed), Colby Crossing (site plan approved), Middle Creek Regional Pump Station (approved).
A number of rezonings have been approved or are pending approval along and adjacent to this corridor. The current status of the following rezonings follows: 18CZ19 Cash Corporate Center (approved), 14CZ16 Aquiline PUD (approved), 17CZ19 MFW Investments, LLC PUD (approved), 16CZ32 Trinity Apex PUD (approved), and 18CZ04 Horton Park PUD Amendment (approved, conditions indicate phasing is dependent on extension of Jessie Drive), 18CZ30 Cozy Homes, LLC (approved), 09CZ07 Veridea (sustainable development plan approved), 06CZ26 Jessie Commons (PUD approved).
There are multiple funded roadway projects in the vicinity of this project including Ten Ten Road Widening (U-5825), NC 55 Widening (U-2901B), and NC 540 Southeast Extension (R-2721). U-5981, US 1/NC 55 Interchange improvements is in the development program of the STIP.



2. Are there any adopted plans for growth or economic development that could directly affect or be affected by this project?
[Peak Plan 2030](#) is the Town’s Comprehensive Plan. The plan identifies the following recommendations relevant to the study area:
“Identify new industrial/business/office park sites totaling 100-150 contiguous acres on NC-55, US-64, US-1, and Jessie Drive to accommodate non-retail employment growth. These corridors capitalize on access to NC-540.”



<p><i>“Preserve access and visibility for large parcels that could be developed as employment centers or mixed-use communities on key transportation corridors such as US-64, NC-55, South Salem Street, and Jessie Drive.”</i></p> <p><i>The Town recently adopted Advance Apex: The 2045 Land Use Map Update and the 2045 Land Use Map. Changes to the land use map in the project vicinity include: the designation of Knight’s Play as Park-Public or Private, increased residential densities and mixed use opportunities near the future high school planned south of Jessie Drive, and mixed use opportunities at the southwest corner of the intersection of Jessie Drive and Ten Ten Road.</i></p>	
<p>3. Are there plans to extend water/sewer lines or to build any new facilities, such as fire stations, schools, or other facilities, in the vicinity of the project?</p> <p><i>The approved Horton Park PUD will extend water from Jessie Drive, the Pemberley subdivision, and Smith Road. The PUD will also build the Middle Creek North Pump Station to provide sanitary sewer service to the Middle Creek Drainage basin north of Colby Chase Drive. A new high school is planned south of Jessie Drive (closer to Sunset Lake Road) with the main point of access likely from the east via Stephenson Road. Plans for Horton Park Pods 5-8 include construction of a Horton Park Drive, a collector street that will intersect with Jessie Drive near the midpoint between NC 55 and Ten Ten Road. A pre-application meeting for the Jessie Drive project is scheduled for April 4, 2019. Additional information from Water Resources and other departments may be provided at that time.</i></p>	<input checked="" type="checkbox"/>
<p>4. Are there any specific business and/or economic resources present in the project area, such as business parks, distribution centers, manufacturing facilities, etc.?</p> <p><i>Pinnacle Park, an existing business park, is located north of future Jessie Drive, between Ten Ten Road and NC 55. Wake Tech Community College - Western Wake Campus, is located to the southeast of the project corridor off Kildaire Farm Road.</i></p> <p><i>An important petroleum resource to the region, the Dixie Pipeline, is located along NC 55 just north of future Jessie Drive. NC 55 has been shut down for incidents related to the pipeline in the past. Jessie Drive would provide an alternative route in these situations.</i></p> <p><i>A Motiva fuel terminal is located on Ten Ten Road north of existing Jessie Drive and would likely use Jessie Drive extension to access NC 55 and the US 1 interchange. Currently fuel trucks turn left on Ten Ten Road to reach US 1. There are other light industrial businesses along the Ten Ten corridor including Atlantic Mulch, Tractor Tracs and Mastec.</i></p> <p><i>The plans associated with Horton Park and the Cash Corporate Center are anticipated to further enhance the economic resources in this area.</i></p>	<input checked="" type="checkbox"/>
<p>Special Populations</p>	
<p>5. Are you aware of any minority, low-income or limited English proficiency (LEP) populations/communities in the vicinity of the project? If so, please provide the locations of these populations in the area. <i>[If yes, proceed to Question 6. If no, skip to Question 7.]</i></p> <p><i>The project is located in an area of transition where there is a mix of affluent populations and low income populations, both in the vicinity of Ten Ten Road and NC 55.</i></p> <p><i>Near NC 55, along Bobbitt Road, south of the project vicinity, there is a presence of low-income and minority populations. Many of these residents are frequently observed walking along NC 55.</i></p> <p><i>There are older, rural homes with minority residents both along Ten Ten Road and south of the project along Smith Road. Based on observation, the minority walkers/bikers seen on Ten Ten Road appear to be traveling to and from work.</i></p>	<input checked="" type="checkbox"/>



<p><i>This project is located in Census Tract 534.20. In 2017, 44.5% of residents in this Census Tract reported themselves as any race other than white, non-Hispanic; 6.9% of the population reported being 65 years or older; 5.8% of the population reported living under the poverty threshold; and 3.1% of households reported having Limited English Proficiency.¹ This Census Tract has the highest percentage of minority populations in the Town of Apex.</i></p>	
<p>6. Are there specific community resources or services that are used by minority, low-income or LEP populations in the vicinity of the project? How is the project likely to affect minority and low-income populations?</p> <p><i>Restaurants and services along NC 55 are frequently used by minority, low-income, and LEP populations in the vicinity of the project. Existing apartments and affordable houses may be occupied by zero-car households. Accommodating bicycle and pedestrian traffic will be important.</i></p> <p><i>Wake Tech Community College - Western Wake Campus and Goodwill are located near this project along Kildaire Farm Road in Cary. A number of churches are located in the project vicinity along NC 55 and Ten Ten Road. See question 8 for a list of churches in the area.</i></p>	<input checked="" type="checkbox"/>
<p>7. Are there any tribal groups connected with land, religious, ethnic or other special populations with different mobility needs or outreach needs in the project area?</p> <p><i>None known</i></p>	
<p>8. Who should we contact to discuss outreach needs for any special populations? Please provide input on community leader contacts, media sources or other ways to reach these populations.</p> <p><i>There are several churches in the area that may assist with outreach to special populations including: New Life Community Church, Hope Community Church, The Point Church, Grace Church, Felton Grove Missionary Baptist Church, and Resurrection Life Church.</i></p> <p><i>It would also be beneficial to reach out to the Town of Cary as this project is adjacent to the Cary Corporate Limits.</i></p>	<input checked="" type="checkbox"/>
<p>Access, Accessibility, and Mobility</p>	
<p>9. Is there pedestrian or bicycle activity/traffic or transit use along the project? If so, please describe multimodal activity in the project area.</p> <p><i>See previous forms and responses. Individuals are frequently observed walking along NC 55 and Ten Ten Road adjacent to this corridor.</i></p> <p><i>There is no existing transit service along Ten Ten Road, but Ten Ten Road and future Jessie Drive have been identified as potential future transit routes in the Town's long range transportation plan.</i></p> <p><i>Ten Ten Road is a designated bicycle route. Bicycle and pedestrian improvements are planned as part of U-5825.</i></p> <p><i>Middle Creek Greenway will be built in phases, through both public and private development projects. Middle Creek Greenway will cross Jessie Drive.</i></p>	<input checked="" type="checkbox"/>

¹ US Census Bureau American Community Survey, 2017.



<p><i>Future Jessie Drive has been identified as a Strategic Freight Corridor in regional and local plans.</i></p>	
<p>10. Are there any existing access, accessibility, or mobility concerns or any barriers to non-auto travel in the area? Please consider all modes.</p> <p><i>There are currently no bicycle or pedestrian facilities along existing Jessie Drive. The project should address both movement along the corridor and locations for bicycle and pedestrians to cross the corridor. Bicycle and pedestrian crossing facilities should be provided where Jessie Drive intersects Ten Ten Road and NC 55. Bicycle and pedestrian crossings should be considered at the future intersection of Jessie Drive and Production Drive, where the Middle Creek Greenway is planned to cross Jessie Drive. There is no existing transit service along Jessie Drive or adjacent streets. Local plans recommend transit service along future Jessie Drive.</i></p> <p><i>Concerns related to emergency access are described in the input form completed for emergency responders.</i></p>	<input checked="" type="checkbox"/>
<p>11. Are there any adopted plans for pedestrian, greenway, bicycle, or transit facilities in the area? For each plan, please provide a description of how the plan applies to the project area, the title of the plan, its year of adoption, and the current status of its implementation.</p> <p><u>Advance Apex</u> (2019), the Town’s transportation plan includes local bus routes along Jessie Drive, Ten Ten Road, and NC 55. Wake Transit Plans include a new route, HSX Holly Springs-Apex-Cary Express, which will provide service along NC 55, adjacent to this corridor. GoCary will operate this service and it is anticipated to begin operations January 2020.</p> <p><u>Bike Apex</u> (2019), the Town’s bicycle plan, recommends side path along both sides of Jessie Drive from Ten Ten Road to Veridea Parkway. Bicycle recommendations adjacent to this corridor include side path along Reliance Avenue/Production Drive extension, side path along both sides of NC 55, and bike lanes along Ten Ten Road. Middle Creek Greenway is planned to extend from Holly Springs to Lufkin Road Middle School. The greenway will likely cross over Jessie Drive where it intersects Production Drive at a signalized intersection. The planned greenway is west of a future high school.</p> <p><i>Developments are required to provide sidewalk along both sides of all collector streets and thoroughfares and along one side of all residential streets.</i></p> <p><i>Maps depicting existing and planned bicycle, pedestrian and transit facilities are shown on the following maps: <u>Bicycle, Pedestrian, and Equestrian Plan</u>; <u>Parks, Recreation, Greenways, and Open Space Master Plan</u>; <u>Transit Plan</u>.</i></p>	<input checked="" type="checkbox"/>
<p>Agricultural Operations</p>	
<p>12. Are you aware of any active agricultural operations in the vicinity of the project? If so, please describe these operations (e.g. size, ownership, crops, years farmed, suppliers, customers, value to the community). <i>[If yes, answer Question 12. If no, skip to Question 13.]</i></p> <p><i>None known</i></p>	<input type="checkbox"/>
<p>13. Are farm support services—such as farm suppliers, equipment dealers, processing and storage facilities, and farmer’s markets—located in the vicinity of the project? If so, please describe these services (e.g. type, location).</p> <p><i>None known</i></p>	<input type="checkbox"/>
<p>14. Does the project lie within a VAD or EVAD district, or are you aware of any land with other farmland protections (plans, tax districts or credits, trust, agricultural zoning, deed restrictions)? If so, please describe the nature and location of these areas and properties.</p> <p><i>No</i></p>	<input type="checkbox"/>



Other Notable Features	
15. Are there any recreational properties within the project area that were purchased or improved with Land and Water Conservation Act funds? <i>None known</i>	<input type="checkbox"/>
16. Are there any other specific notable community resources or issues in the project area? (e.g. socio-economic resources, recreational resources, community safety concerns, cohesive neighborhoods, areas in decline) If so, please describe. <i>Apex Fire Department Station 4 is located on NC 55, north of the project corridor. Knight's Play Golf Course is a privately-owned recreational resource. This site has been identified on the Town's 2045 Land Use Map as Park – Public or Private.</i>	<input checked="" type="checkbox"/>
Detours and Closures	
17. Are there any future time periods or events that you know of where road or bridge closure or reduction in number of lanes for construction would be of particular concern? <i>Not applicable.</i>	<input type="checkbox"/>
18. <i>[If applicable]</i> Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes, or the location of resources along these routes? <i>Not applicable.</i>	<input type="checkbox"/>
19. Rate the overall impact on local planning objectives if the bridge or roadway were closed or at reduced capacity for up to a year: <input type="checkbox"/> Positive Impact <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact <i>Not applicable</i>	
Closing Questions	
20. Are road names referenced by the names locals would use? <i>Yes</i>	<input checked="" type="checkbox"/>
21. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? <i>Town of Cary should be contacted regarding this project.</i>	<input checked="" type="checkbox"/>
22. Do you have any additional comments about this project? <i>Thank you for the opportunity to provide comments on this important project. Please continue to keep the Town informed and let us know how we can help with the studies and work going forward.</i>	<input checked="" type="checkbox"/>



Local Schools Input Form

NC Department of Transportation Community Studies Group, Human Environment Section Local Schools Input Form for JESSIE DRIVE IMPROVEMENTS AND EXTENSION PROJECT FEASIBILITY STUDY COMMUNITY CHARACTERISTICS REPORT	
Contact Information	
Interviewee Name: Stephen Sposato	Date: August 16, 2018
Title/Position: Senior Administrator, Transportation	Phone Number: (919) 533-7837
Organization/Agency: Wake County Schools	
Email: ssposato2@wcpss.net	Completed Via: <input type="checkbox"/> Email <input checked="" type="checkbox"/> Phone
Check all questions that apply and provide a detailed explanation of your response in the field provided.	Check if item is applicable
1. How many school buses pass through the corridor per day (total # of daily buses, total # daily of trips)? <i>Since this is a future road there are no existing bus trips. Jessie Drive will serve as an alternative route to NC 55 and relieve the congestion on NC 55, Ten Ten Road and Lufkin Road. A new high school is planned south of Jessie Drive with the main point of access likely from the east via Stephenson Road. Jessie Drive will definitely be more important in the future to distribute trips and allow for alternative ways to get to area schools as this area changes.</i>	<input type="checkbox"/>
2. Is the corridor used by carpool traffic or pedestrians to access local schools? If yes, please describe the location and time(s) of day. <i>Since this is a future road there are no existing carpool or pedestrian trips. Middle Creek Greenway is planned to extend from Holly Springs to Lufkin Road Middle School. It will be important to consider how greenway users cross Jessie Drive. The greenway will likely cross over Jessie Drive where it intersects Production Drive at a signalized intersection. A signalized crossing would be favorable. The planned greenway is west of the future high school. Sidepaths and/or sidewalks may be needed to connect the greenway to the future high school along roadways.</i>	<input type="checkbox"/>
3. [Applicable if schools are located in or near the project area] Are there any Safe Routes to School plans in place at schools in the vicinity of the project? <i>Not applicable</i>	<input type="checkbox"/>
4. Based on your knowledge of the project area, do you have any concerns with the condition/capacity of potential detour routes or the location of resources along these routes with respect to school traffic? <i>Not applicable</i>	<input type="checkbox"/>
5. Are there any future time periods or events that you know of where reduction in number of lanes for construction would be of particular concern? <i>Not applicable</i>	<input type="checkbox"/>
6. Rate the overall impact on school transportation if the roadway were at reduced capacity for up to a year: <input type="checkbox"/> No Impact <input type="checkbox"/> Low Impact <input type="checkbox"/> Moderate Impact <input type="checkbox"/> High Impact <i>Not applicable</i>	<input type="checkbox"/>
7. Are road names referenced by the names locals would use?	<input checked="" type="checkbox"/>



<p>Yes</p>	
<p>8. Is there anyone else you feel should be contacted regarding this project (i.e. local officials or stakeholders)? <i>Town of Apex</i></p>	<p style="text-align: center;"><input checked="" type="checkbox"/></p>
<p>9. Are there any other concerns you have regarding the potential impact of this project on school transportation services or any additional comments? Please be as specific as possible. <i>The Jessie Drive project will have a positive impact on school transportation and will help to mitigate future congestion on Ten Ten Road and NC 55. WCPSS is in favor of streets that provide connectivity. The only potential issue is during construction when Jessie Drive ties into NC 55. It is anticipated that this will be considered further during design.</i></p>	<p style="text-align: center;"><input checked="" type="checkbox"/></p>



APPENDIX D: HEALTH INDICATORS TABLE

CHARACTERISTIC	SMALLEST DATA LEVEL	JESSIE DRIVE EXTENSION DSA	WAKE COUNTY	NORTH CAROLINA	DATA SOURCE	NOTES
Number of Pedestrian or Bicyclist Crashes in DCIA (Ped/Bike)	<i>DCIA</i>	(1/0)			http://ncdot.map.sarcgis.com/home/webmap/viewer.html?useExisting=1	Count the number of crashes within the DCIA from 2007-2012 using NCDOT's Bicyclist and Pedestrian Crash Map.
Average Pedestrian Crash Rate	<i>City</i>		3.04	2.77	http://www.pedbikeinfo.org/pbcat_nc/	Crashes per 10,000 residents, avg. of 2008-2012 crash totals, 2010 pop
Average Bicyclist Crash Rate	<i>City</i>		1.44	1.03	http://www.pedbikeinfo.org/pbcat_nc/	Crashes per 10,000 residents, avg. of 2008-2012 crash totals, 2010 pop
Physical Inactivity	<i>County</i>		19.0%	25.0%	http://www.countyhealthrankings.org/app/north-carolina/2014/overview	Percent of adults aged 20+ reporting no leisure-time physical activity, 2010
Access to exercise opportunities	<i>County</i>		86%	65.0%	http://www.countyhealthrankings.org/app/north-carolina/2014/overview	Percentage of individuals who reside in a census block within a half mile of a park or (urban) one mile of a rec. facility or (rural) three miles of a rec. facility, 2010 & 2012





FEASIBILITY STUDY REPORT – JESSIE DRIVE IMPROVEMENTS AND EXTENSION
APEX, NC

Traffic Capacity Analysis Report (May 2019)

May 31, 2019

Mr. Russell Dalton, P.E.
Town of Apex, Senior Transportation Engineer
73 Hunter Street
Apex, NC 27502



RE: *Jessie Drive Improvements and Extension Feasibility Study – Traffic Capacity Analysis*

Dear Mr. Dalton:

Kimley-Horn and Associates, Inc. has performed traffic capacity analyses associated with the Jessie Drive Improvements and Extension Feasibility Study. The proposed extension would connect Jessie Drive from Ten Ten Road to NC 55 in Apex, NC. The project study area is shown on **Figure 1**, and the existing roadway laneage for the study area can be found on **Figure 2**. These are included as attachments to the end of this report.

Capacity analyses were performed for several traffic conditions to determine the projected operations of the intersections within the study area. The analyzed scenarios are listed below:

1. No Build (2022) – Opening Year
2. No Build (2045) – Design Year
3. Build (2022)
4. Build (2035) – Interim Year
5. Build (2045)

Traffic capacity analyses were performed at the following intersections:

1. Jessie Drive at Ten Ten Road
2. NC 55 at Future Jessie Drive Extension / Future West Connection

Traffic volumes for the study intersections were developed based on the Revised Jessie Drive Improvements and Extension Feasibility Study Traffic Forecast prepared by Kimley Horn, dated March 1, 2019. The original forecast was completed in November 2018 and was updated to better match the traffic volumes in the U-5825 Traffic Forecast and to better account for traffic associated with the Horton Park and Jessie Commons developments.

Traffic volumes for the year 2022 were calculated by growing the 2018 traffic volumes using growth rates generated from straight line interpolation of the forecast volumes. Similarly, Build (2035) traffic volumes were found by reducing the Build (2045) traffic volumes using the same annual growth rates. Two proposed developments, Jessie Commons and Horton Park, are located within the project vicinity. It was assumed that 50% of Horton Park would be built out by the opening year (2022) analysis scenario and that both developments would be fully constructed for the interim year (2035) and future year (2045) analysis scenarios.

The average annual daily traffic (AADT) was converted to peak hour volumes for the study scenarios using the NCDOT peak hour volume breakout tool. The traffic forecast, estimated forecasts for the opening (2022) and interim (2035) scenarios, and peak hour volume breakout reports are included in

the attachments at the end of this report. Peak hour traffic volumes for all study scenarios can be found in **Figures 3-7**.

The Statewide Transportation Improvement Program (STIP) includes an adjacent project within the study area at the intersection of Jessie Drive at Ten Ten Road. Project U-5825 proposes to widen Ten Ten Road from Apex Peakway to Kildaire Farm Road. Improvements associated with this project were included in the interim year (2035) analysis as well as the design year (2045) analyses for the Jessie Drive at Ten Ten Road intersection. An exhibit of the proposed laneage for project U-5825 is included as an attachment at the end of this report.

Additionally, a Future West Connection is proposed to tie into NC 55 at the same intersection as the Jessie Drive Extension. This future connection was included in the interim year (2035) and design year (2045) analysis scenarios.

NCDOT Congestion Management Capacity Analysis Guidelines were followed (unless otherwise noted) to develop a network for the study area. Phasing at the signals in the future year analysis was chosen according to Congestion Management guidelines for permitted or protected phasing. A peak hour factor (PHF) of 0.9 was used for all movements. Heavy vehicle percentages were modeled based on the traffic forecast.

Since the intersection of NC 55 at Future Jessie Drive Extension / Future West Connection is proposed to be a conventional superstreet with two separate left-over intersections, U-turn locations were modeled to the north and south using a guidance of 600'-800' of spacing from the main intersections.

Synchro queue analysis was used to evaluate the average and 95th percentile queue lengths at the study intersections. In addition, the data was transferred to SimTraffic to create a representative simulation of traffic conditions. The simulation helped to identify areas where queuing and congestion would present potential problems at the network level, as opposed to intersection performance alone, including the appropriateness of recommended storage lengths. Turn bay length recommendations were developed based on the 95th percentile queue lengths reported in Synchro and observations of SimTraffic simulations. The Synchro LOS reports and SimTraffic Queuing reports are included as attachments to this report.

Jessie Drive at Ten Ten Road

Table 1 below details the results of the intersection analyses for the intersection of Jessie Drive at Ten Ten Road.

Table 1 Level-of-Service Summary		
Condition	AM Peak-Hour LOS (Delay)	PM Peak-Hour LOS (Delay)
Jessie Drive at Ten Ten Road		
No Build (2022) – <i>Signalized</i>	B (18.2)	B (13.8)
No Build (2045) – <i>Signalized</i>	B (19.7)	B (15.4)
Build (2022) – <i>Signalized</i>	C (22.7)	D (35.2)
Build (2035) – <i>Signalized</i>	C (20.3)	C (21.4)
Build (2045) – <i>Signalized</i>	C (27.7)	C (33.1)

No Build 2022

This intersection is currently unsignalized, but based on the analysis of the No Build (2022) condition with the addition of 50% of the Horton Park development, the following improvements are expected to be in place to accommodate the No Build (2022) condition, regardless of whether Jessie Drive is extended or not:

- Install a traffic signal when warranted
- Provide an exclusive northbound left-turn lane along Ten Ten Road with a minimum of 50' of storage
- Provide an exclusive southbound right-turn lane along Ten Ten Road with a minimum of 100' of storage

With these recommendations in place in 2022, this intersection is expected to operate at LOS B during the AM and PM peak hours.

No Build 2045

With an estimated construction year of 2023, project U-5825 is expected to put in the place the following improvements prior to 2045:

- Install a median along Ten Ten Road

- Widen Ten Ten Road to 2 through lanes in the northbound direction and provide a northbound exclusive left-turn lane
- Widen Ten Ten Road to 3 through lanes in the southbound direction
- Provide an exclusive northbound left-turn lane along Ten Ten Road with 400' of storage

A roadway exhibit showing the U-5825 improvements can be found in the attachments at the end of this report.

The following is also recommended to accommodate the No Build (2045) condition:

- Install a traffic signal when warranted
- Provide separate left- and right-turn lanes along Jessie Drive with a minimum of 150' of storage for the right-turn lane

With these improvements in place in 2045, this intersection is expected to operate at LOS B during the AM and PM peak hours. Recommended laneage for the No Build (2045) scenario is provided on **Figure 8** as an attachment to this report.

Build 2022

To accommodate the Build (2022) condition of the Jessie Drive Extension project, the following improvements are recommended:

- Provide separate left- and right-turn lanes along Jessie Drive with a minimum of 200' of storage for the right-turn lane
- Provide an exclusive southbound right-turn lane along Ten Ten Road with a minimum of 100' of storage
- Provide an exclusive northbound left-turn lane along Ten Ten Road with a minimum of 300' of storage
- Install a traffic signal when warranted

With these recommendations in place in 2022, this intersection is expected to operate at LOS C and LOS D during the AM and PM peak hours, respectively. Recommended laneage for the Build (2022) condition is provided on **Figure 9** as an attachment to this report.

Build 2035

With an estimated construction year of 2023, the improvements associated with project U-5825 noted previously are expected to be in place prior to the interim year 2035. In addition to the project U-5825 improvements, the following improvements are recommended as a part of the Jessie Drive Extension project to accommodate the Build (2035) condition:

- Provide separate left- and right-turn lanes along Jessie Drive with a minimum of 250' of storage for the right-turn lane
- Install a traffic signal when warranted

With the U-5825 improvements and these recommendations in place, this intersection is expected to operate at LOS C during the AM and PM peak hours in 2035. Recommended laneage for the Build (2035) condition is provided on **Figure 10** as an attachment to this report.

Build 2045

In addition to the improvements associated with project U-5825 and the improvements recommended in the Build (2035) scenario, the following additional improvement is recommended to accommodate the Build (2045) condition:

- Widen Jessie Drive to a four-lane section and tie the two eastbound lanes into the left- and right-turn lanes at this intersection

With these recommendations in place, this intersection is expected to operate at LOS C during the AM and PM peak hours in 2045. Recommended laneage for the Build (2045) condition is provided on **Figure 11** as an attachment to this report.

Jessie Drive Extension at NC 55

The Jessie Drive Extension project proposes to extend Jessie Drive to NC 55 and create a new 3-legged intersection at that location. Based on initial conversations with Town of Apex staff, it was preferred to analyze this new intersection using a conventional superstreet configuration. Therefore, the intersection was analyzed with left-turn movements allowed from NC 55 and right-turn access only from Jessie Drive.

Regardless of whether the Jessie Drive Extension is constructed, it is assumed in this analysis that a 3rd leg is proposed to tie into this intersection east of NC 55 by way of the Jessie Commons development. Therefore, this intersection was modeled as a 3-leg intersection using the same superstreet configuration stated above for the No Build (2045) scenario.

Table 2 below details the results of the intersection analyses for the intersection of Jessie Drive at NC 55 as well as the proposed Jessie Drive North U-turn location associated with the superstreet configuration.

Table 2 Level-of-Service Summary		
Condition	AM Peak-Hour LOS (Delay)	PM Peak-Hour LOS (Delay)
Jessie Drive Extension at NC 55 (Signalized)		
No Build (2045)	B (12.4)	B (12.6)
Build (2022)	B (17.6)	B (16.5)
Build (2035)	B (16.5)	B (19.6)
Build (2045)	C (30.3)	C (34.4)
Jessie Drive North U-turn (Signalized)		
No Build (2045) – <i>NC 55 Southbound as 3 Lane Section</i>	B (11.3)	C (21.0)
Build (2022) – <i>NC 55 Southbound as 2 Lane Section</i>	B (17.7)	D (41.8)
Build (2022) – <i>NC 55 Southbound as 3 Lane Section</i>	A (8.5)	B (14.5)
Build (2035)	B (11.4)	B (17.5)
Build (2045)	B (14.1)	D (36.0)

No Build 2045

As noted previously, the Jessie Commons development is expected to create a third leg at the intersection of Jessie Drive at NC 55 regardless of whether the Jessie Drive Extension is constructed. The following improvements are expected to be in place to accommodate the No Build (2045) condition at the intersection of Jessie Drive at NC 55:

- Construct this intersection as a signalized superstreet intersection with left-turn access from NC 55 and right-turn access only from Jessie Drive

- Provide dual westbound right-turn lanes on Jessie Drive at NC 55 with a minimum of 200' of storage for the outside right-turn lane
- Provide an exclusive southbound left-turn lane on NC 55 with a minimum of 300' of storage
- Provide an exclusive northbound right-turn lane along NC 55 with 200' of storage
- Widen NC 55 to 3 through lanes in the northbound direction

With these recommendations in place in 2045, the intersection of Jessie Drive at NC 55 is expected to operate at LOS B during the AM and PM peak hours.

At the Jessie Drive North U-turn location along NC 55, the following improvements are expected to be in place to accommodate the No Build (2045) condition:

- Provide a signalized northbound U-turn location north of the Jessie Drive intersection
- Provide an exclusive northbound U-turn lane on NC 55 with a minimum of 250' of storage
- Widen NC 55 to 3 through lanes in the southbound direction

With these recommendations in place in 2045, the Jessie Drive North U-turn location is expected to operate at LOS B and LOS C during the AM and PM peak hours, respectively. Recommended laneage for the No Build (2045) scenario is provided on **Figure 8** as an attachment to this report.

Build 2022

It is proposed to construct the Jessie Drive Extension as a two-lane section until traffic volumes dictate that a wider 4-lane section is needed. To accommodate the Build (2022) condition of the project, the following improvements are recommended at the intersection of Jessie Drive Extension at NC 55:

- Construct this intersection as a signalized superstreet intersection with left-turn access from NC 55 and right-turn access only from Jessie Drive
- Provide dual westbound right-turn lanes on Jessie Drive at NC 55 with a minimum of 200' of storage for the outside right-turn lane
- Provide an exclusive southbound left-turn lane on NC 55 with a minimum of 300' of storage
- Widen NC 55 to 3 through lanes in the northbound direction

With these recommendations in place in 2022, the intersection of Jessie Drive Extension at NC 55 is expected to operate at LOS B during the AM and PM peak hours.

At the Jessie Drive North U-turn location along NC 55, the following improvements are recommended to accommodate the Build (2022) condition:

- Provide a signalized northbound U-turn location north of the Jessie Drive intersection
- Provide an exclusive northbound U-turn lane on NC 55 with a minimum of 300' of storage
- Widen NC 55 to 3 through lanes in the southbound direction

With these recommendations in place in 2022, the Jessie Drive North U-turn location is expected to operate at LOS A and LOS B during the AM and PM peak hours, respectively. Recommended laneage for the Build (2022) condition is provided on **Figure 9** as an attachment to this report.

An analysis was also completed for a Build (2022) scenario that does not include 3 southbound lanes along NC 55. Based on that analysis, the Jessie Drive North U-turn location is expected to operate at LOS B and LOS D during the AM and PM peak hours, respectively. While the overall intersection LOS is projected to be LOS D in the PM peak hour, the analysis for that scenario indicates that the NC 55 through movement is expected to operate at LOS D with long queues, and the U-turn movement is expected to operate at LOS E with long queues. Therefore, it is expected that widening NC 55 to 3 southbound lanes will be needed to provide acceptable operations during the PM peak hour by 2022 or shortly thereafter if the Jessie Drive Extension project is constructed.

Build 2035

In addition to the recommended Build (2022) improvements noted above, the following is recommended to accommodate the Build (2035) condition at the intersection of Jessie Drive Extension at NC 55:

- Provide an exclusive northbound right-turn lane along NC 55 with 200' of storage
- Provide dual westbound right-turn lanes on Jessie Drive at NC 55 with a minimum of 300' of storage for the outside right-turn lane

With these recommendations in place in 2035, the intersection of Jessie Drive Extension at NC 55 is expected to operate at LOS B during the AM and PM peak hours.

At the Jessie Drive North U-turn location along NC 55, the following is recommended to accommodate the Build (2035) condition in addition to the recommended Build (2022) improvements noted above:

- Construct a second northbound U-turn lane on NC 55 to provide dual U-turn lanes with a minimum of 300' of storage for each

With these recommendations in place in 2035, the Jessie Drive North U-turn location is expected to operate at LOS B during the AM and PM peak hours. Recommended laneage for the Build (2035) condition is provided on **Figure 10** as an attachment to this report.

Build 2045

In addition to the recommended Build (2035) improvements noted above, the following is recommended to accommodate the Build (2045) condition at the intersection of Jessie Drive Extension at NC 55:

- Widen Jessie Drive to a four-lane section and tie the two westbound lanes into the dual right-turn lanes at this intersection

With these recommendations in place in 2045, the intersection of Jessie Drive Extension at NC 55 is expected to operate at LOS C during the AM and PM peak hours.

At the Jessie Drive North U-turn location along NC 55, no additional improvements are recommended to accommodate the Build (2045) condition beyond those noted above for the Build (2035) condition. With these recommendations in place in 2045, the Jessie Drive North U-turn location is expected to operate at LOS B and LOS D during the AM and PM peak hours, respectively. Recommended laneage for the Build (2045) condition is provided on **Figure 11** as an attachment to this report.

Future West Connection at NC 55

A Future West Connection is proposed to tie into NC 55 and create a 4th leg to the intersection with the Jessie Drive Extension. Note that while the Jessie Drive Extension and the Future West Connection are proposed to tie into NC 55 at the same location, the analyses are presented as separate intersections since they are expected to operate as separate conventional superstreet intersections. Based on initial conversations with Town of Apex staff, it was assumed that the Future West Connection will be in place prior to the interim year (2035) and design year (2045) but not the opening year (2022) condition. Since a conventional superstreet was being evaluated at this location, the intersection was analyzed with left turn movements allowed from NC 55 and right-turn access only from Future West Connection.

Table 3 below details the results of the intersection analyses for the intersection of Future West Connection at NC 55 as well as the proposed Future West Connection South U-turn location associated with the superstreet configuration.

Table 3 Level-of-Service Summary		
Condition	AM Peak-Hour LOS (Delay)	PM Peak-Hour LOS (Delay)
Future West Connection at NC 55 (Signalized)		
No Build (2045)	B (14.6)	B (13.7)
Build (2035)	B (16.9)	B (14.3)
Build (2045)	C (26.2)	B (19.2)
Future West Connection South U-turn (Signalized)		
No Build (2045)	C (28.3)	B (13.7)
Build (2035)	B (18.1)	B (13.5)
Build (2045)	C (23.1)	B (12.5)

No Build 2045

Based on the capacity analysis presented above, the following improvements associated with the proposed Future West Connection were assumed to be in place at the intersection of Future West Connection at NC 55 by the 2035 and 2045 analysis years, regardless of whether the Jessie Drive Extension is constructed or not:

- Construct this intersection as a signalized superstreet intersection with left-turn access from NC 55 and right-turn access only from the Future West Connection
- Provide dual eastbound right-turn lanes on the Future West Connection
- Provide an exclusive northbound left-turn lane on NC 55 with a minimum of 250' of storage
- Provide an exclusive southbound right-turn lane on NC 55 with a minimum of 200' of storage
- Widen NC 55 to 3 through lanes in the southbound direction

Based on the analysis of these improvements for the No Build (2045) condition, the intersection of Future West Connection at NC 55 is expected to operate at LOS B in the AM and PM peak hours.

At the Future West Connection South U-turn location along NC 55, the following improvements were assumed to be in place by the 2035 and 2045 analysis years, regardless of whether the Jessie Drive Extension is constructed or not:

- Provide a signalized southbound U-turn location south of the Future West Connection intersection
- Provide an exclusive southbound U-turn lane on NC 55 with a minimum of 300' of storage
- Widen NC 55 to 3 through lanes in the northbound direction

Based on the analysis of these improvements for the No Build (2045) condition, the Future West Connection South U-turn location is expected to operate at LOS C and LOS B during the AM and PM peak hours, respectively. Recommended laneage for the future year No Build (2045) condition is provided on **Figure 8** as an attachment to this report.

Build 2035

At the intersection of Future West Connection at NC 55, no additional improvements are recommended to accommodate the Build (2035) condition beyond those noted above. Based on the analysis of these improvements for the Build (2035) condition, the intersection of Future West Connection at NC 55 is expected to operate at LOS B in the AM and PM peak hours.

At the Future West Connection South U-turn location along NC 55, the following is recommended to accommodate the Build (2035) condition in addition to the improvements noted above:

- Construct a second southbound U-turn lane on NC 55 to provide dual U-turn lanes with a minimum of 250' of storage for each

Based on the analysis of these improvements for the Build (2035) condition, the Future West Connection South U-turn location is expected to operate at LOS B during the AM and PM peak hours.

Recommended laneage for the Build (2035) condition is provided on **Figure 10** as an attachment to this report.

Build 2045

At the intersection of Future West Connection at NC 55, no additional improvements are recommended to accommodate the Build (2045) condition beyond those noted above. Based on the analysis of these improvements for the Build (2045) condition, the intersection of Future West Connection at NC 55 is expected to operate at LOS C in the AM peak hour and LOS B in the PM peak hour.

At the Future West Connection South U-turn location along NC 55, no additional improvements are recommended to accommodate the Build (2045) condition beyond those noted above. Based on the analysis of these improvements for the Build (2045) condition, the Future West Connection South U-turn location is expected to operate at LOS C and LOS B during the AM and PM peak hours, respectively.

Should you have any questions or comments, please do not hesitate to contact me at (919) 678-4128 or kevin.baumann@kimley-horn.com.

Sincerely,
Kimley-Horn and Associates, Inc.



Kevin Baumann, P.E.
Project Engineer

Attachments: Figures 1-11, Traffic Forecast and Peak Hour Volume Breakout Reports, Synchro LOS Reports, SimTraffic Queueing and Blocking Reports, U-5825 Roadway Concept Exhibits

Attachments

Figures

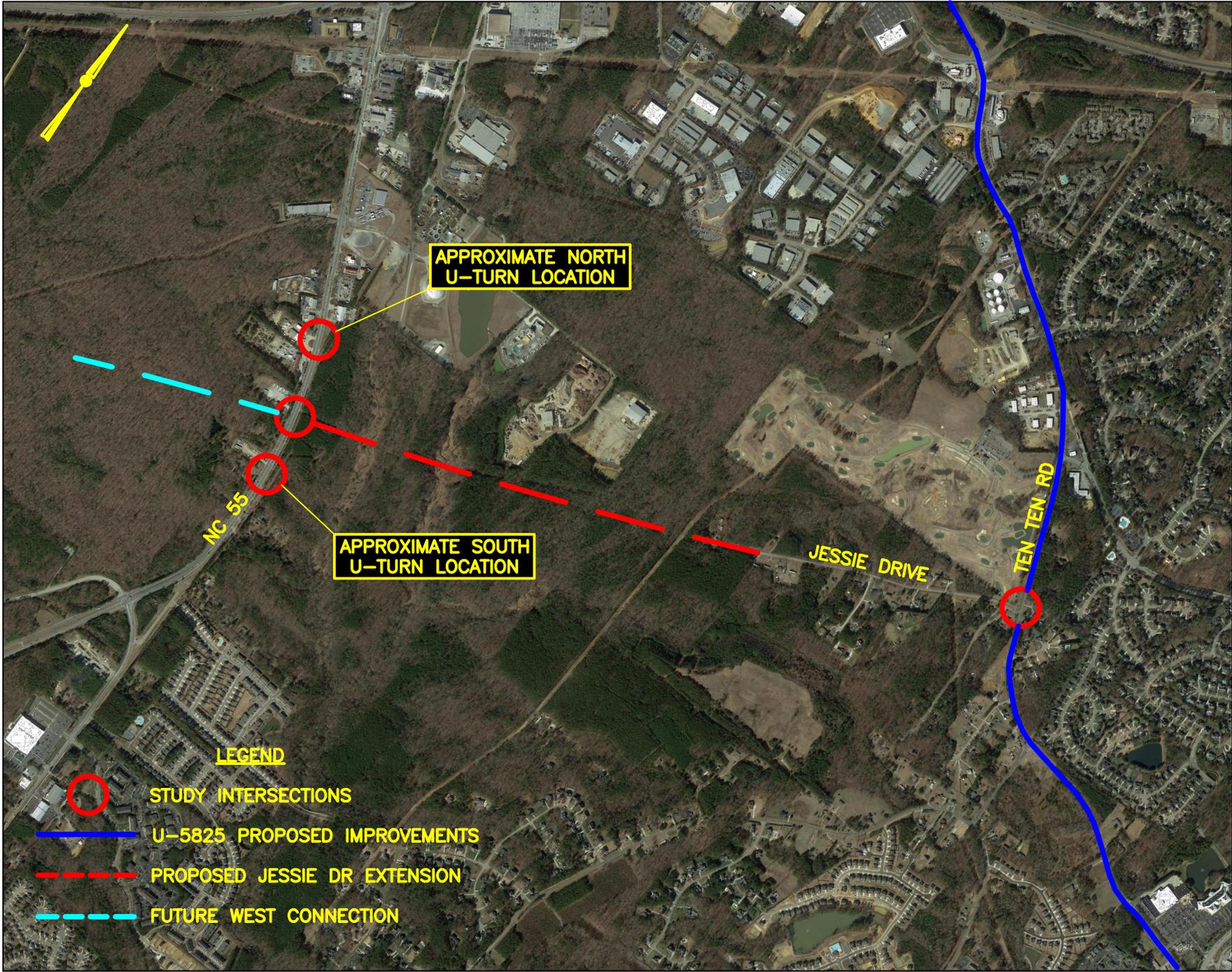


FIGURE
1

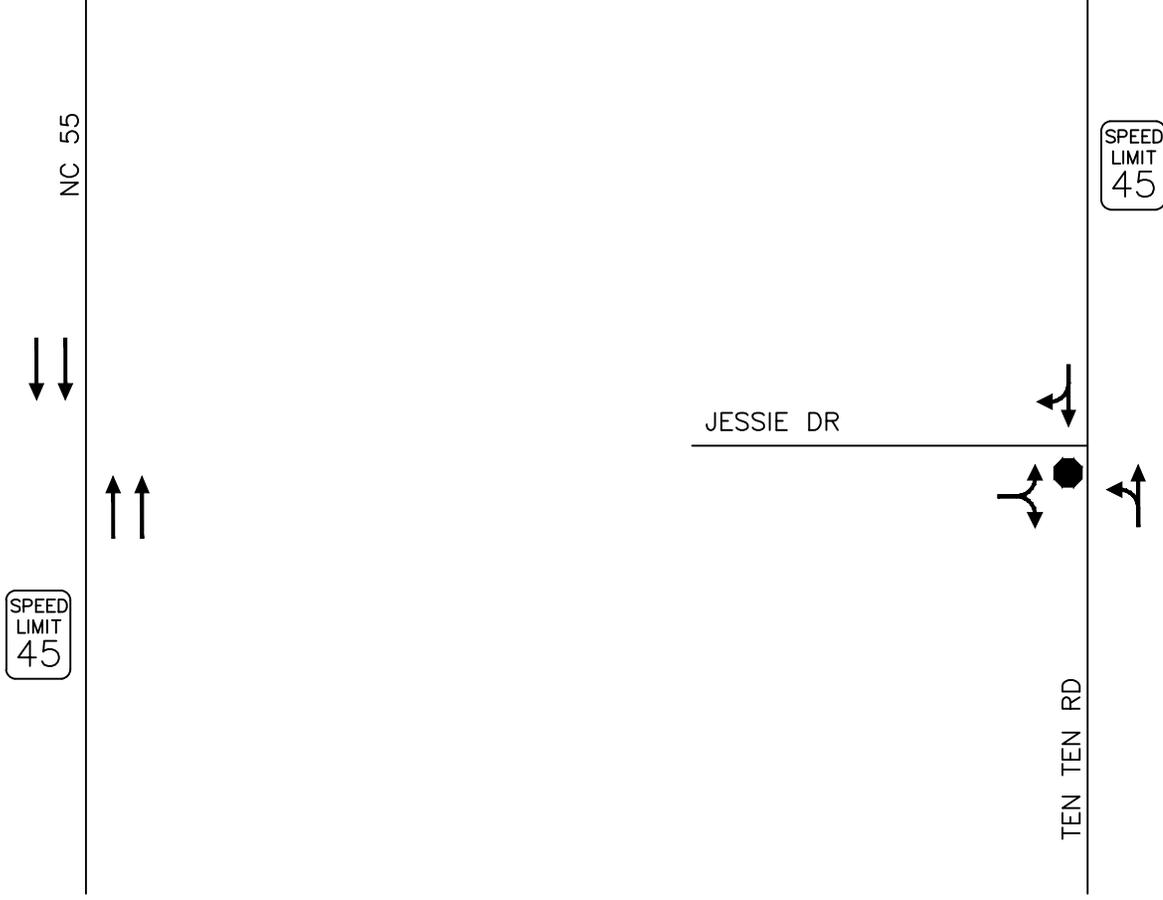
STUDY AREA

JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC



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

NOT TO SCALE



LEGEND

-  EXISTING LANE
-  EXISTING STOP SIGN
-  POSTED SPEED LIMIT



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

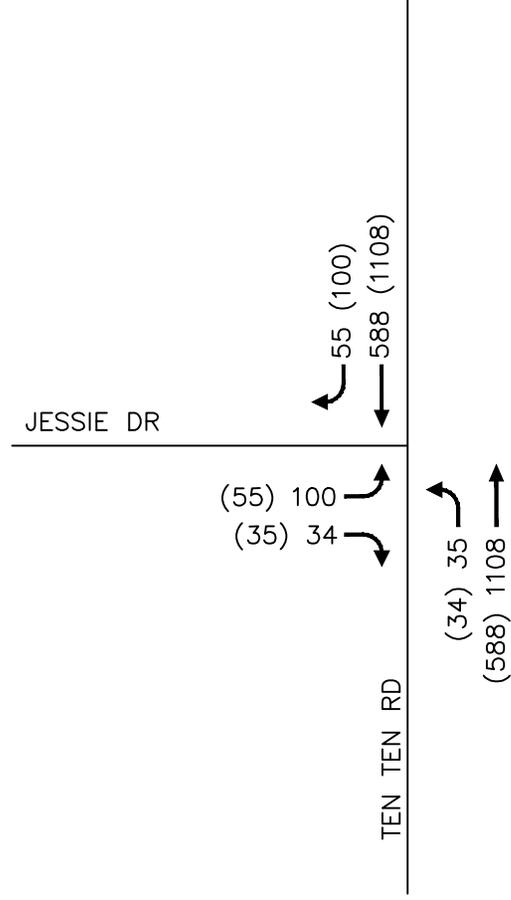
EXISTING LANEAGE

FIGURE
2

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



NOT TO SCALE



LEGEND

XX AM PEAK HOUR

(XX) PM PEAK HOUR



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

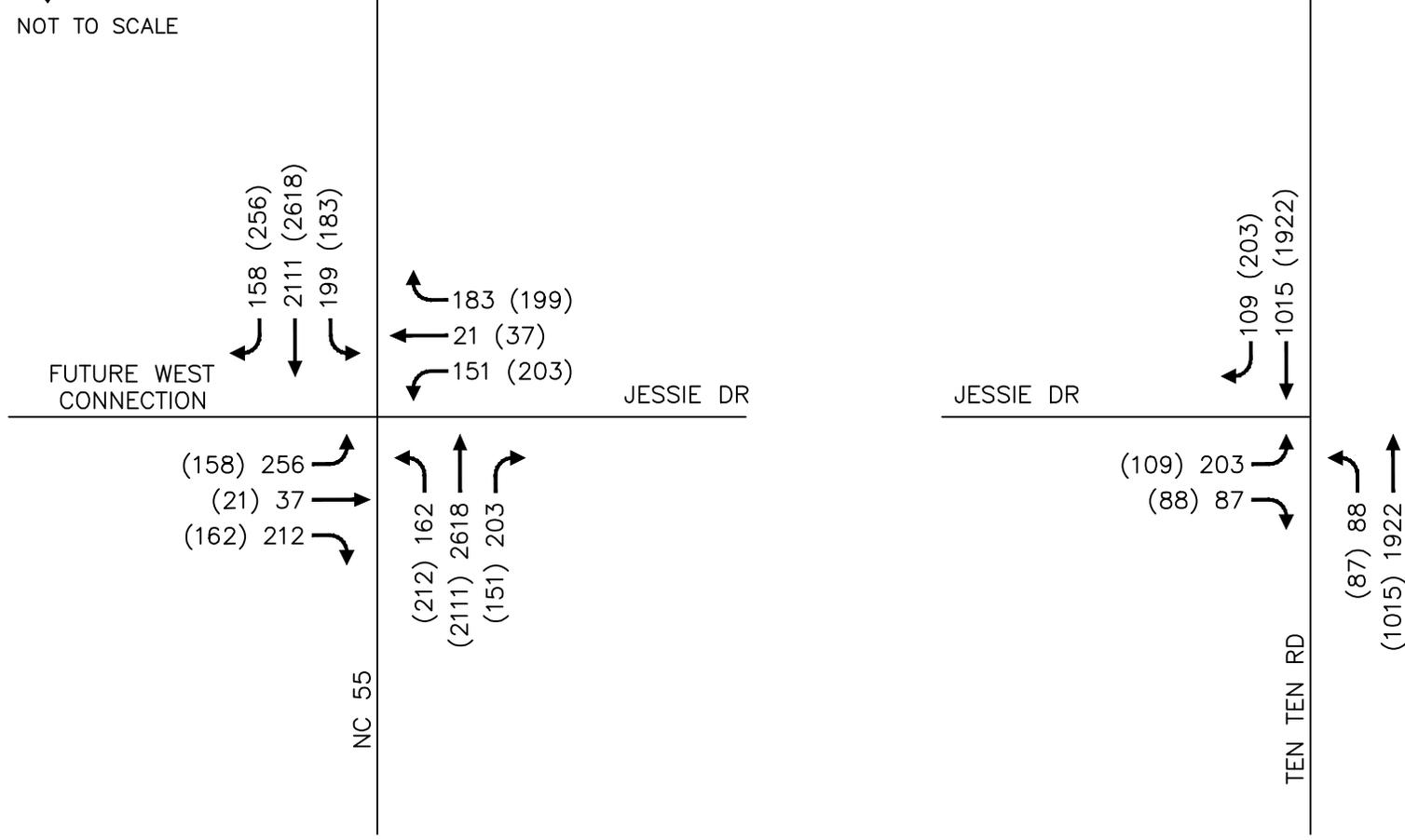
OPENING YEAR (2022)
NO BUILD
PEAK HOUR TRAFFIC VOLUMES

FIGURE
3

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



NOT TO SCALE



LEGEND

XX AM PEAK HOUR

((XX)) PM PEAK HOUR

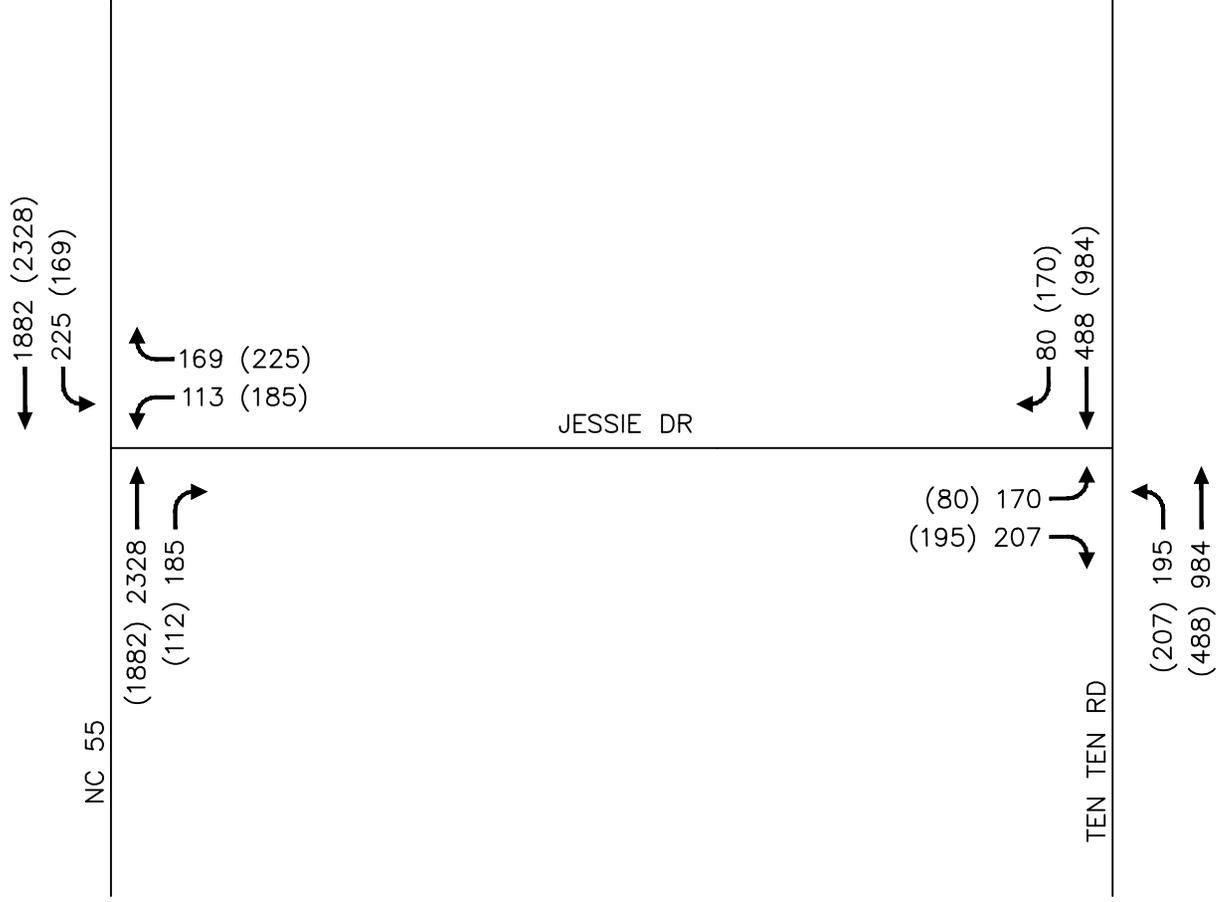


JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

FUTURE YEAR (2045)
NO BUILD
PEAK HOUR TRAFFIC VOLUMES

FIGURE
4

NOT TO SCALE



LEGEND

XX AM PEAK HOUR

(XX) PM PEAK HOUR



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

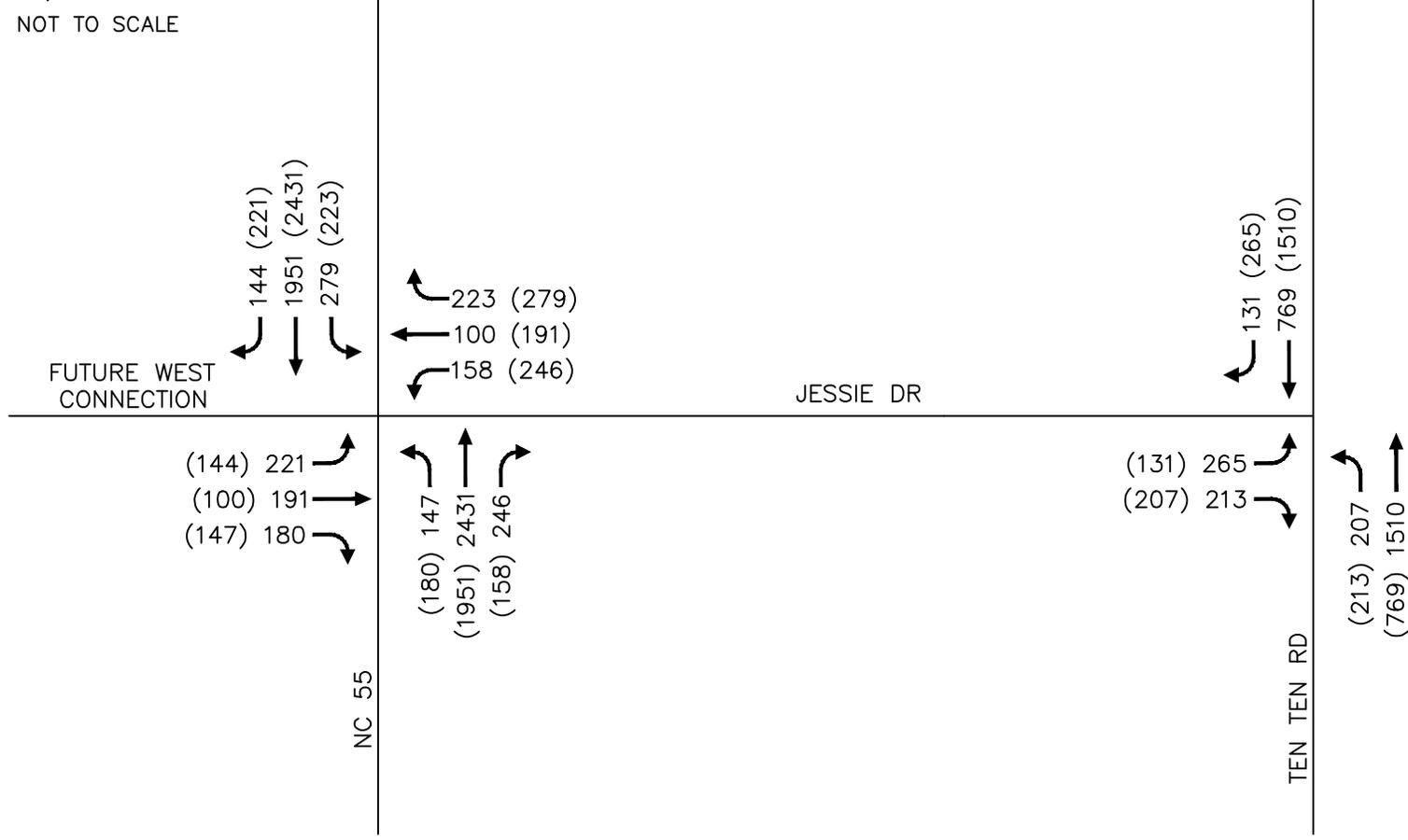
OPENING YEAR (2022) BUILD
PEAK HOUR TRAFFIC VOLUMES

FIGURE
5

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



NOT TO SCALE



LEGEND

XX AM PEAK HOUR

(XX) PM PEAK HOUR



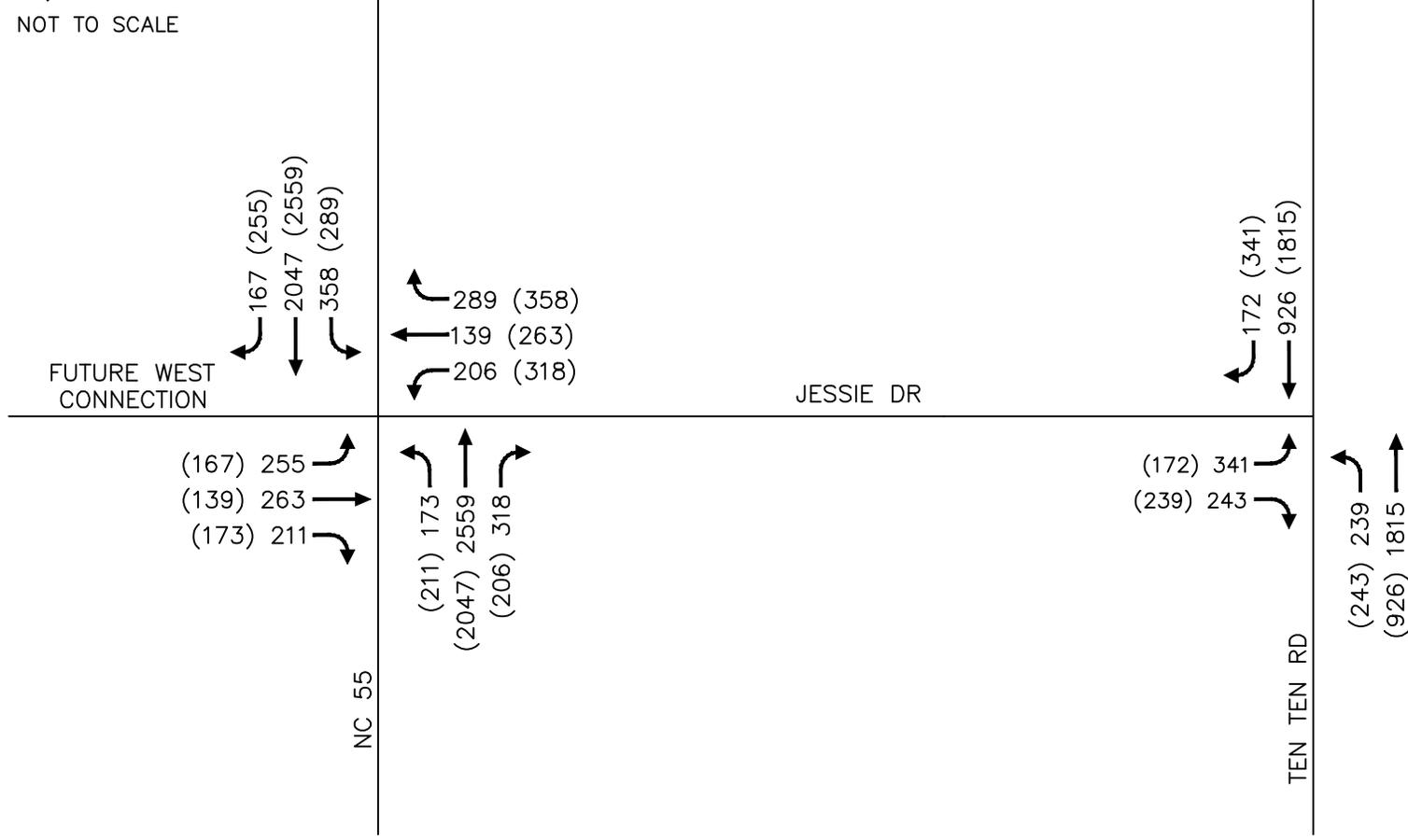
JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

INTERIM YEAR (2035) BUILD
PEAK HOUR TRAFFIC VOLUMES

FIGURE
6



NOT TO SCALE



LEGEND

XX AM PEAK HOUR

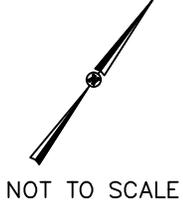
(XX) PM PEAK HOUR



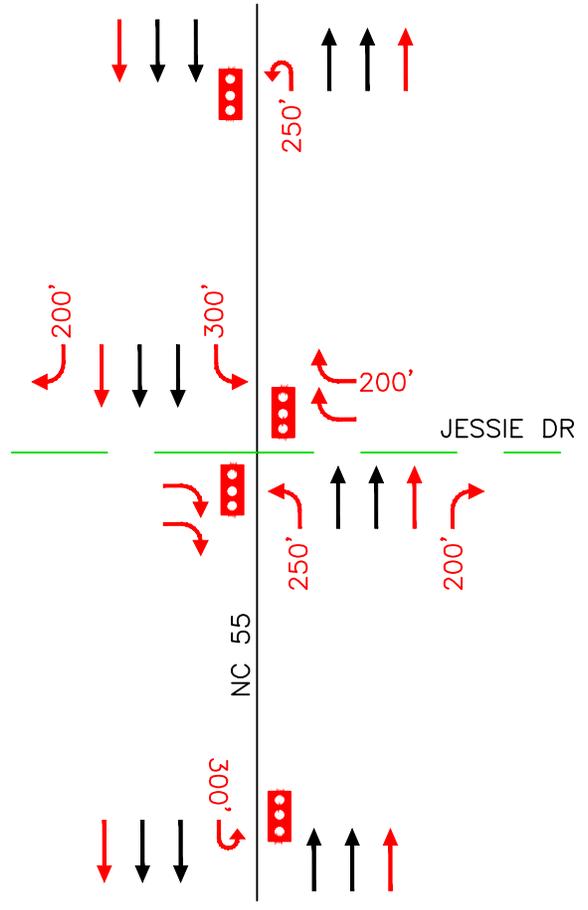
JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

FUTURE YEAR (2045) BUILD
PEAK HOUR TRAFFIC VOLUMES

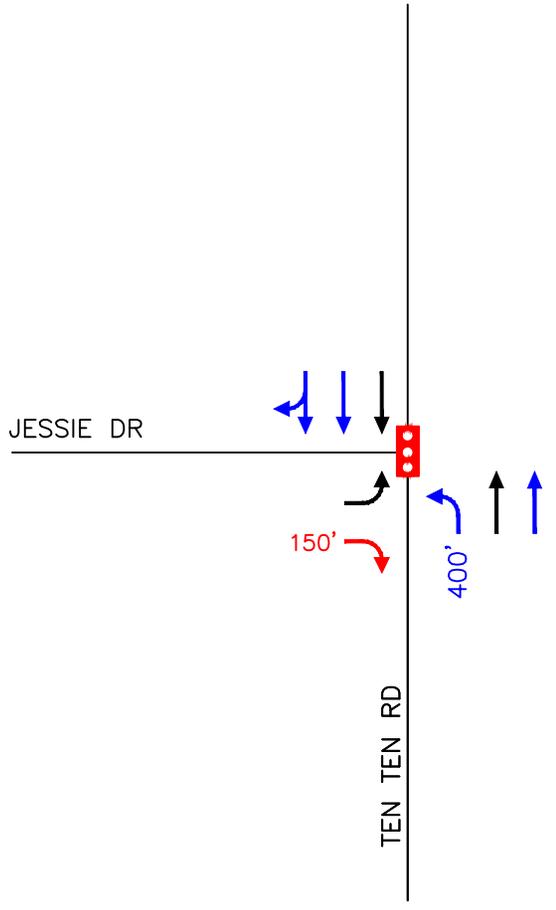
FIGURE
7



FUTURE WEST CONNECTION



JESSIE DR



- ← EXISTING LANE
- ← U-5825 PROPOSED LANE
- ← RECOMMENDED LANE

LEGEND

- RECOMMENDED TRAFFIC SIGNAL
- XX' STORAGE LENGTH
- FUTURE NO BUILD CONNECTION



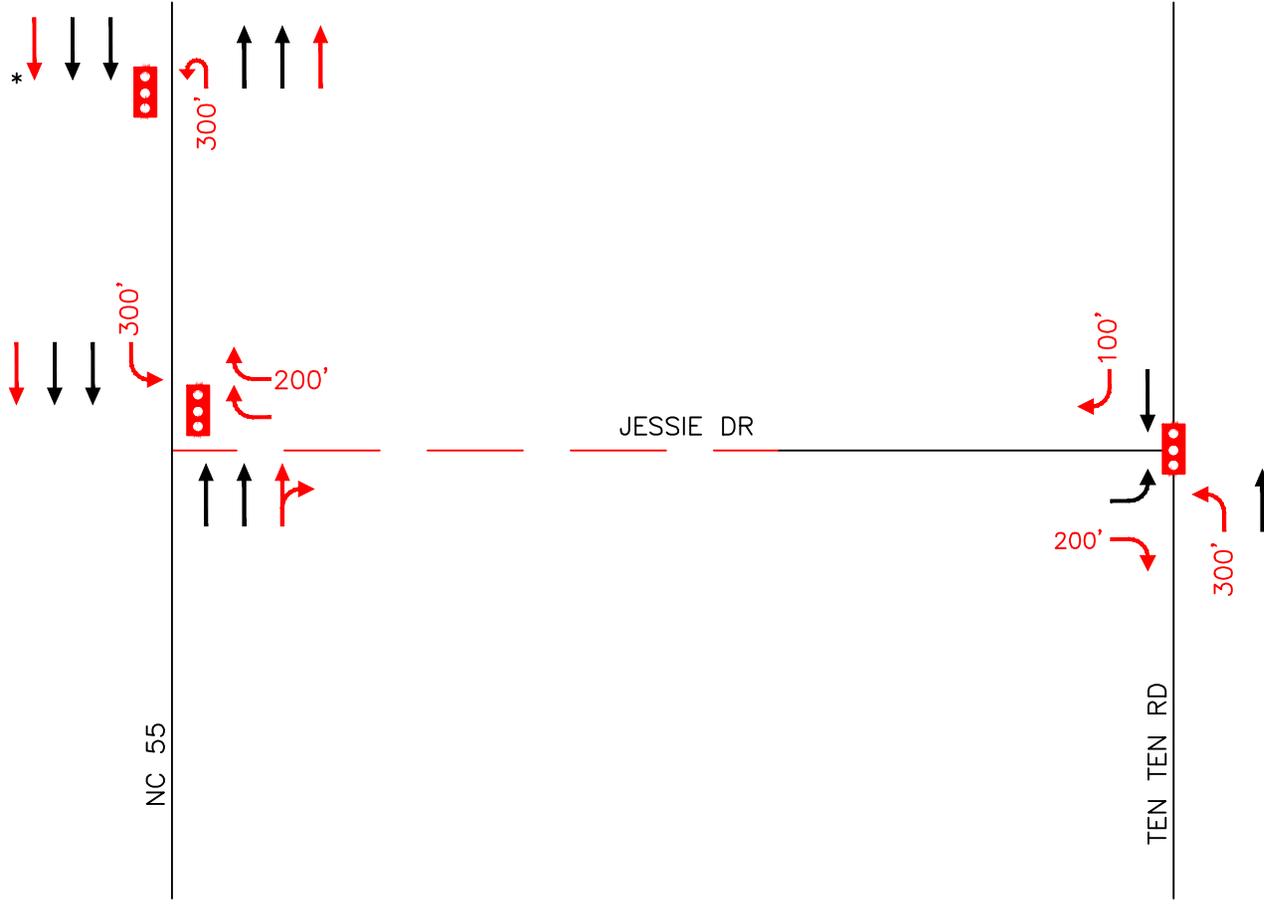
JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

RECOMMENDED
NO BUILD LANEAGE
- FUTURE YEAR (2045)

FIGURE
8

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

NOT TO SCALE



* AN ALTERNATIVE WITH 2 SOUTHBOUND LANES ALONG NC 55 WAS ALSO INCLUDED AS A PART OF THE ANALYSIS.

LEGEND

- ← EXISTING LANE
- ← RECOMMENDED LANE
- RECOMMENDED TRAFFIC SIGNAL
- XX' STORAGE LENGTH
- - - PROPOSED CONNECTION



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

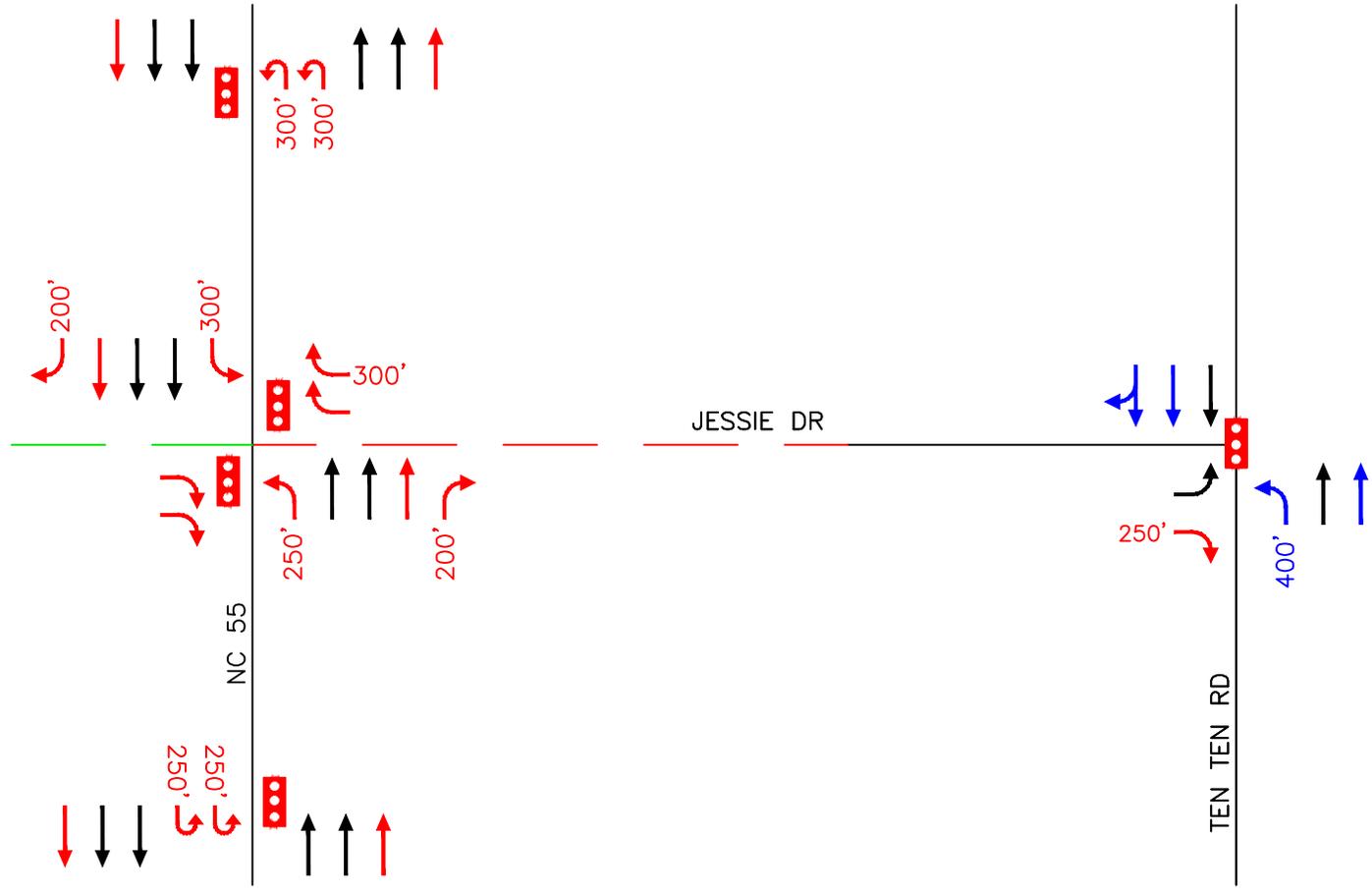
RECOMMENDED BUILD LANEAGE
- OPENING YEAR (2022)

FIGURE
9

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



FUTURE WEST CONNECTION



LEGEND

- ← EXISTING LANE
- ← U-5825 PROPOSED LANE
- ← RECOMMENDED LANE
- RECOMMENDED TRAFFIC SIGNAL
- XX' STORAGE LENGTH
- FUTURE NO BUILD CONNECTION
- PROPOSED CONNECTION



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

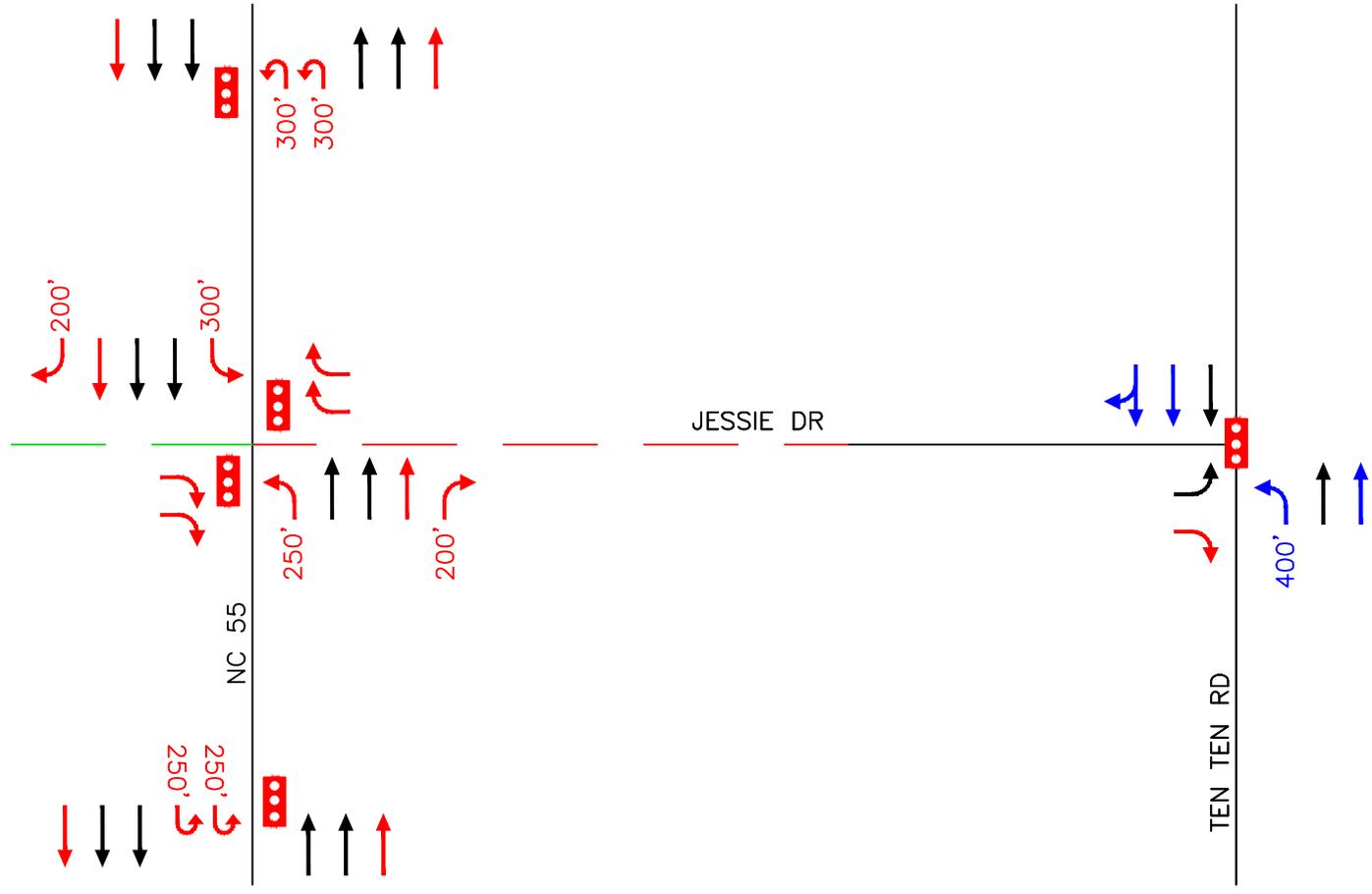
RECOMMENDED BUILD LANEGE
- INTERIM YEAR (2035)

FIGURE
10

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



FUTURE WEST CONNECTION



LEGEND

- ← EXISTING LANE
- ← U-5825 PROPOSED LANE
- ← RECOMMENDED LANE
- ☐ RECOMMENDED TRAFFIC SIGNAL
- XX' STORAGE LENGTH
- FUTURE NO BUILD CONNECTION
- PROPOSED CONNECTION



JESSIE DRIVE
IMPROVEMENTS AND EXTENSION
FEASIBILITY STUDY
APEX, NC

RECOMMENDED BUILD LANEAGE
- FUTURE YEAR (2045)

FIGURE
11

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

Traffic Forecast

March 1, 2019

■
421 Fayetteville St.
Suite 600
Raleigh, North Carolina
27601

Memorandum To: Russell Dalton
Town of Apex

From: Tim Padgett, PE
Kimley-Horn and Associates, Inc.

Subject: Traffic Forecast for Jessie Drive Extension, Apex, Wake County

This forecast has been reviewed and approved by the NCDOT Transportation Planning Division as of **November 28, 2018**.

Please find attached the 2018 traffic estimate and 2045 traffic forecast for the above referenced project. The following scenarios are provided:

- Base Year 2018 No-Build
- Base Year 2018 Build
- Future Year 2045 No-Build
- Future Year 2045 Build

This forecast was requested as part of the project feasibility study.

Project Area. The project area is in Wake County and entails the extension of Jessie Drive from NC 55 to Ten Ten Road.

The traffic forecast was performed for each of the following scenarios:

- Base Year 2018 No-Build
- Base Year 2018 Build
 - Jessie Drive connection from NC 55 to Ten Ten Road
- Future Year 2045 No-Build
 - Contains all projects in LRTP except Jessie Drive extension from NC 55 to Ten Ten Road
- Future Year 2045 Build
 - Jessie Drive connection from NC 55 to Ten Ten Road

Future Conditions and Development Activity. The forecast was developed using output from the Triangle Regional Model (TRMv6) along with growth trend information from historic traffic counts. Assumptions about future development activity and changes in the distribution of population and employment in the forecast study area are implicit in the model.

Forecast Methodology. The Base year 2018 estimates and Horizon Year 2045 forecasts provided were developed using a method under which observed traffic data as well as 2013 and 2045 model output (TRMv6) were considered.

Traffic Forecast Report

**Proposed Extension of Jessie Drive from NC 55 to Ten
Ten Road**

March 2019

Prepared By: Kimley-Horn and Associates, Inc.

Table of Contents

Traffic Forecast Report

1. Project Background
 - Project Request Information
2. Sources of Information and Data
 - Historic AADT
 - Field Data Collection
3. Base Year 2018 No - Build Forecast
 - Methodology
 - Determination of Design Factors
4. General Model Data
 - Model Information
5. Base Year 2018 Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors
6. Future Year 2045 No - Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors
7. Future Year 2045 Build Forecast
 - Assumptions
 - Methodology
 - Determination of Design Factors

Traffic Forecast Report

1. Project Background

Project Request Information

This forecast provides information related to the proposed extension of Jessie Drive between NC 55 and Ten Ten Road in Apex, Wake County, NC. The forecast base year is 2018 and the forecast build year is 2045.

Forecast variations include the following:

- Base Year 2018 No-Build
- Base Year 2018 Build
- Future Year 2045 No-Build
- Future Year 2045 Build

2. Sources of Information and Data

Historic AADT

Historic Average Annual Daily Traffic (AADT) volumes from 2002 through 2017 were used as part of the 2018 forecast process. Historic AADTs were available at the following locations.

- Ten Ten Road north of Jessie Drive
- NC 55 north of the proposed Jessie Drive Extension

Field Data Collection

Turning movement counts were collected in September, 2018 (13-hour TMC) at the Ten Ten Road/Jessie Drive intersection. 24-hour tube counts (camera) were collected at the same time on Ten Ten Road north of Jessie Drive and on NC 55 north of the proposed Jessie Drive extension.

3. Base Year 2015 No-Build Forecast

Methodology

Historic AADT information along with the turning movement counts were used to determine the current AADTs and turning movements on all facilities and at their intersections. The turning movements were balanced using the Traffic Forecast Utility Intersection Analysis tool.

Determination of Design Factors

Design factors for 2018 were calculated from turning movement counts. Factors include TTSTs, duals, D, and Design K Factor.

4. General Model Data

Model Information

The Triangle Regional Model (TRMv6) was used during the development of this forecast. The model has a base year of 2013 and a future year of 2045.

The model was coded and run for each of the following scenarios:

- 2013 (model) No-Build – No changes to existing 2013 model
- 2013 (model) Build – Jessie Drive coded from NC 55 to Ten Ten Road
- 2045 (model) No-Build – Jessie Drive connection between NC 55 and Ten Ten Road removed, all other MTP projects remain.
- 2045 (model) Build – No changes to existing 2045 model, Jessie Drive Extension is already included

Note that Jessie Drive west of NC 55 exists in the 2045 network. It is assumed that this link will be built in both the 2045 No-Build and 2045 Build forecasts.

5. Base Year 2018 Build Forecasts

Assumptions

The 2018 Build scenario includes coding Jessie Drive as a 4-ln median divided section between NC 55 and Ten Ten Road.

Methodology

The 2013 model was run for the build scenario and diversion was calculated. These diversions were then analyzed for logical comparison.

Model diversions were very small on NC 55 and Ten Ten Road with moderate traffic on Jessie Drive extension. The general pattern of movement consisted of NC 55 south traffic turning left on Jessie Drive to get to Ten Ten Road along with the reverse movement of Ten Ten Road north traffic using Jessie Drive to get to NC 55.

Because the NB model did not have Jessie Drive, no diversion could be calculated for this link. Final volumes were chosen based on model diversions, model volumes and engineering judgment.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor and truck percentage) due to the new connection to NC 55. All other design factors are assumed to remain the same as the No-Build condition.

6. Future Year 2045 No-Build Forecast

Assumptions

Within the Metropolitan Planning Organization (MPO) area, future forecasts are based on projects included in the Financial Plan for the 2045 Capital Area Metropolitan Planning

Organization (CAMPO) MTP. This information is included in the official version of the TRM (TRMv6). All development projected in the model is included as input to this forecast.

Known developments adjacent to the proposed Jessie Drive extension include the following:

- Jessie Commons (approved) – Office and Commercial development at future Jessie Drive/NC 55 Intersection
- Elite Waste Services (under construction) – reclamation services and dumpster rental
- Horton Park (approved) - residential

Methodology

For the Future Year 2045 No-Build Forecast, the following factors were considered when developing volumes. First, the historic growth in the area was calculated from AADT data for each link where AADT data was available. Second, the model growth in the area was calculated from model data (2013 to 2045) for each link. This data was factored from AWDT to AADT using the Traffic Survey Unit Average Week Day factors to provide a direct comparison to Historic AADT. In both cases (historic growth and model growth), the Average Annual Rate method was used to calculate growth.

Model growth was calculated by facility throughout the project area. In the case of historic AADTs, weighted averages ranged from 1.1% and 1.8%. In the case of model volumes, weighted averages generally ranged between 0.0% and 2.7%.

Growth percentages were calculated based on the available data. This information was analyzed, and appropriate values were applied to the 2018 No-Build Forecast using engineering judgment and turning movements and mainline volumes were balanced and adjusted as necessary.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor) due to the Horton Park development. All other design factors are assumed to remain the same as the No-Build condition.

7. Future Year 2045 Build Forecasts

Assumptions

The 2045 Build scenario includes coding Jessie Drive as a 4-ln median divided section between NC 55 and Ten Ten Road.

Methodology

Similar to the 2018 Build case, for the 2045 Build forecast, the 2045 model was run, and diversion was calculated.

Model diversions were similar in pattern to 2018. The final chosen diversions were based on these model calculations along with engineering judgment. These diversions were applied to the Future Year No-Build forecast for the Build scenario and each intersection was rebalanced.

Determination of Design Factors

Design factors on Jessie Drive are assumed to change slightly (K-factor and Truck percentage) due to the new connection to NC 55 along with anticipated industrial type development adjacent to the corridor and the addition of the Horton Park development. All other design factors are assumed to remain the same as the No-Build condition.



*Jessie Drive
Improvements and
Extension Feasibility
Study*

**Base Year
2018**

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\frac{PM}{(d,t)}$ → D

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,t) Dual, TT-STs (%)

- Existing Roadway
- Road Widening
- - - Proposed Roadway

EXTENTS

*NC 55 (E Williams Street) between
US Route 1 and NC 540; Ten Ten
Road at Jessie Drive*

Wake County Division 5

PROJECT

*Extension of Jessie Drive in Apex,
NC to NC 55 (E Williams Street) from
Ten Ten Road*

SHEET 1 OF 2

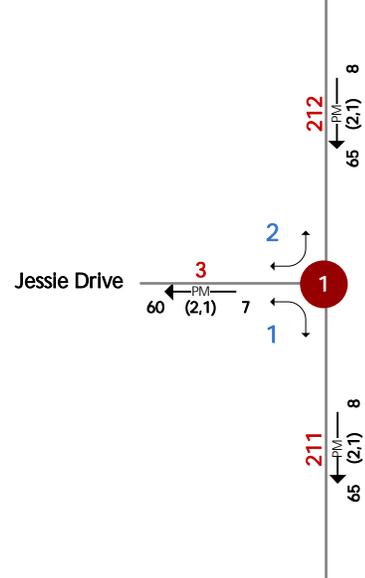
March 1, 2019



NC 55 (East Williams Street)

440
55 (2,1) 10

Ten Ten Road

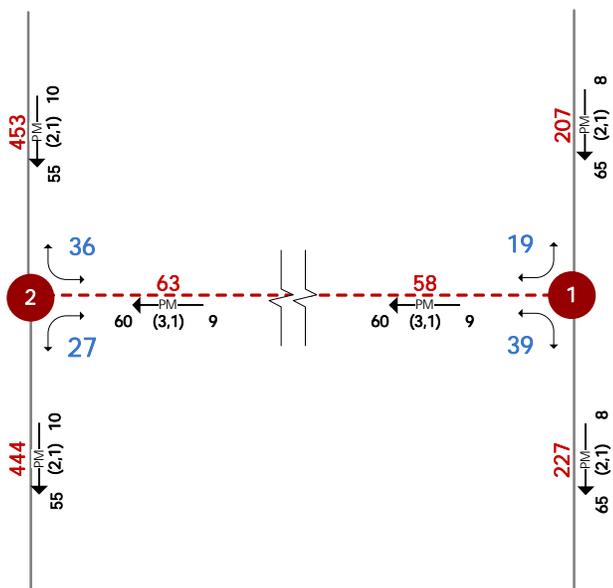


**2018
No-Build**

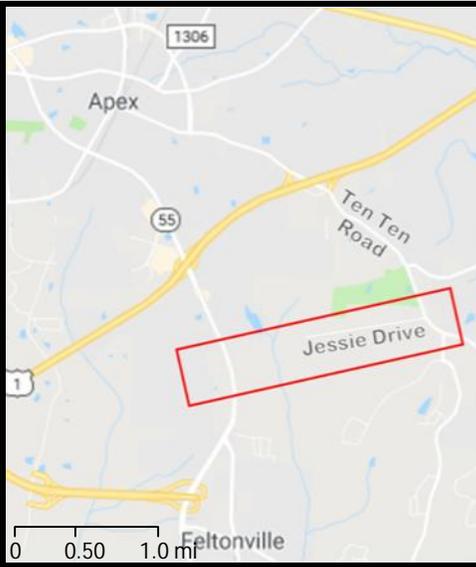
NC 55 (East Williams Street)

453
55 (2,1) 10

Ten Ten Road



**2018
Build**



*Jessie Drive
Improvements and
Extension Feasibility
Study*

Future Year 2045

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\frac{PM}{(d,t)} \rightarrow D$

DHV Design Hourly Volume (%) = K30
 PM PM Peak Period
 D Peak Hour Directional Split (%)
 → Indicates Direction of D
 (d,t) Dual, TT-STs (%)

— Existing Roadway
 — Road Widening
 - - - Proposed Roadway

EXTENTS

*NC 55 (E Williams Street) between
US Route 1 and NC 540; Ten Ten
Road at Jessie Drive*

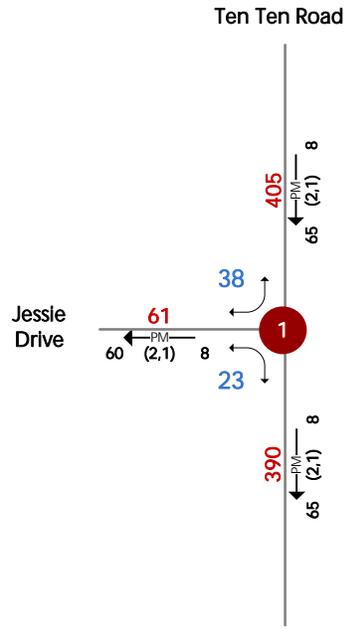
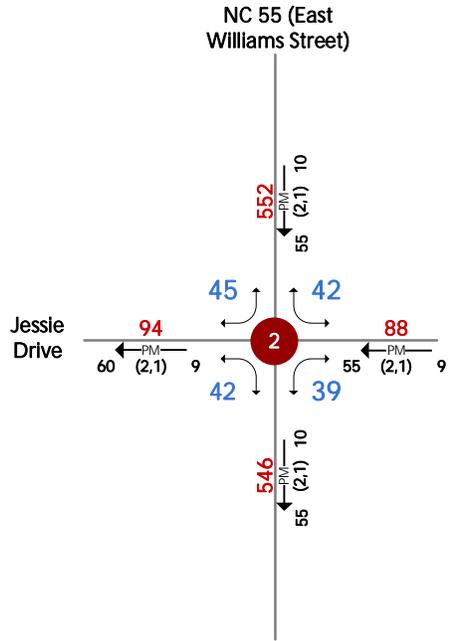
Wake County Division 5

PROJECT

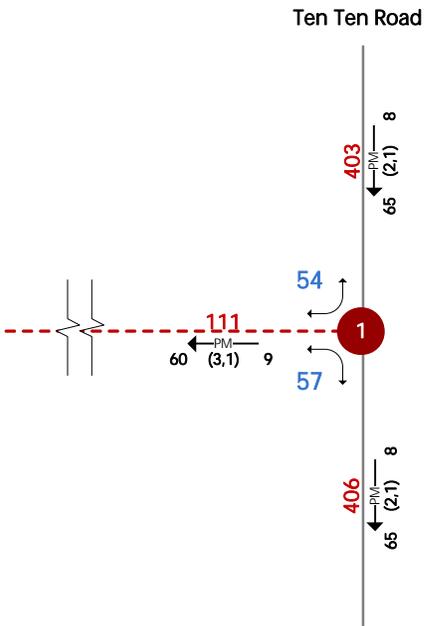
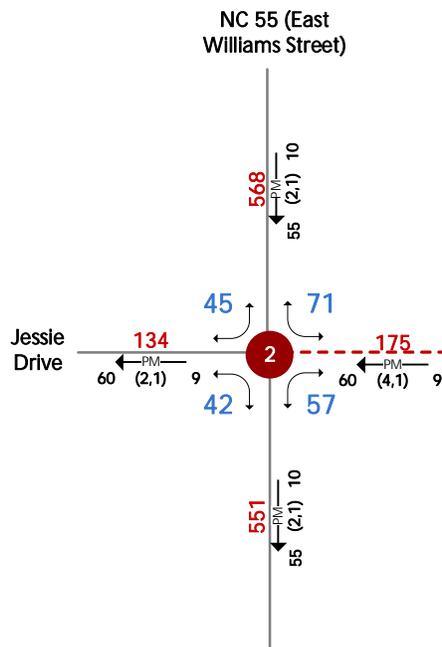
*Extension of Jessie Drive in Apex,
NC to NC 55 (E Williams Street) from
Ten Ten Road*

SHEET 2 OF 2

March 1, 2019



2045
No-Build



2045
Build

Appendix A
Data Tables

Historic AADT Table

Location	NCDOT Historic Traffic Count Data						2018 Project Specific Count Data		2018 NB Forecast Chosen
	2012	2013	2014	2015	2016	2017	TMC	Mainline	
Ten-Ten Road South of Jessie Drive	-	-	-	-	-	-	20100	-	21100
Ten-Ten Road North of Jessie Drive	-	20000	-	19000	-	22000	20100	20300	21200
Jessie Drive West of Ten-Ten Road	-	-	-	-	-	-	300	-	300
E Williams Street South of Jessie Drive	-	-	-	-	-	-	0	45400	44000
E Williams Street North of Jessie Drive	-	42000	-	43000	-	43000	0	45400	44000
* Linear Growth									

Design Data

Location	D – Directional Distribution %			K – Peak Hour Factor %			% Trucks		
	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value	2018 TMC Data	Chosen 2018 No Build Value	Chosen 2018 Build Value
Ten-Ten Road South of Jessie Drive	65%	65%	65%	8%	8%	8%	(2,1)	(2,1)	(2,1)
Ten-Ten Road North of Jessie Drive	65%	65%	65%	8%	8%	8%	(2,1)	(2,1)	(2,1)
Jessie Drive West of Ten-Ten Road	60%	60%	60%	7%	7%	9%	(2,1)	(2,1)	(3,1)
E Williams Street South of Jessie Drive	55%	55%	55%	10%	10%	10%	(2,1)	(2,1)	(2,1)
E Williams Street North of Jessie Drive	55%	55%	55%	10%	10%	10%	(2,1)	(2,1)	(2,1)
Jessie Drive East of E Williams Street	-	-	60%	-	-	9%	-	-	(3,1)

Growth Rate Table

Location	Forecast (2018 No Build)	Historic Growth Rate		Model Growth Rate	Applied Rate	2045 NB Volumes	
	AADT	Approximate 5yr.*	Approximate 20yr.*	2013-2045		Model	Forecast
Ten-Ten Road South of Jessie Drive	21100	18.5%	-	2.7%	2.3%	32981	39000
Ten-Ten Road North of Jessie Drive	21200	-1.3%	0.0%	2.4%	2.4%	30602	40500
Jessie Drive West of Ten-Ten Road	300	-	-	-	11.8%	-	6100
E Williams Street South of Jessie Drive	44000	-	-	0.8%	0.8%	50716	54600
E Williams Street North of Jessie Drive	44000	-0.6%	1.8%	0.1%	0.8%	40915	55200
Jessie Drive West of E Williams Street	-	-	-	-	-	10432	9400
Jessie Drive East of E Williams Street	-	-	-	-	-	-	8800

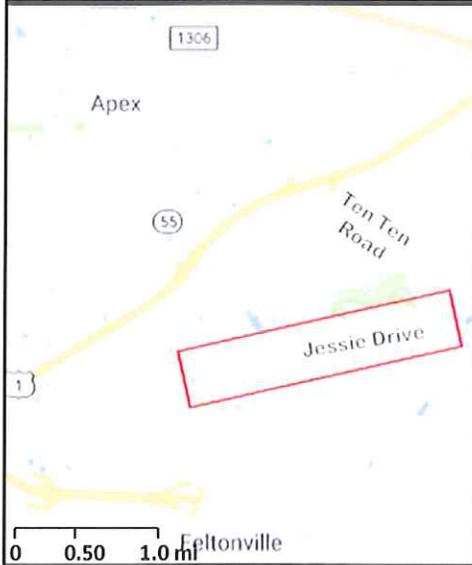
* Linear Growth

Base Year Model Diversion Table (Build)

Location	2018 Forecast No Build	2013 Model No Build	2013 Model Build	Model Diversion	Diversion % Chosen	2018 Forecast Build
Ten-Ten Road South of Jessie Drive	21100	14199	15268	7.5%	7.6%	22700
Ten-Ten Road North of Jessie Drive	21200	14199	13897	-2.1%	-2.4%	20700
Jessie Drive West of Ten-Ten Road	300	-	4396	-	1833.3%	5800
E Williams Street South of Jessie Drive	44000	39780	39751	-0.1%	0.9%	44400
E Williams Street North of Jessie Drive	44000	39780	40507	1.8%	3.0%	45300
Jessie Drive East of E Williams Street	-	-	5646	0.0%	-	6300

2045 Model Diversion Table (Build)

Location	2045 Forecast No Build	2045 Model No Build	2045 Model Build	Model Diversion	Diversion % Chosen	2045 Forecast Build
Ten-Ten Road South of Jessie Drive	39000	32981	33462	1.5%	4.1%	40600
Ten-Ten Road North of Jessie Drive	40500	30602	30468	-0.4%	-0.5%	40300
Jessie Drive West of Ten-Ten Road	6100	-	6844	-	82.0%	11100
E Williams Street South of Jessie Drive	54600	50716	49833	-1.7%	0.9%	55100
E Williams Street North of Jessie Drive	55200	40915	41871	2.3%	2.9%	56800
Jessie Drive West of E Williams Street	9400	10432	14886	42.7%	42.6%	13400
Jessie Drive East of E Williams Street	8800	-	12054	-	98.9%	17500



*Jessie Drive
Improvements and
Extension Feasibility
Study*

~~Base Year~~ Opening Year
~~2018~~ 2022

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\xrightarrow{\text{PM}}$ D
(d,t)

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,t) Dual, TT-STs (%)

- Existing Roadway
- Road Widening
- - - Proposed Roadway

EXTENTS

*NC 55 [E Williams Street] between
US Route 1 and NC 540; Ten Ten
Road at Jessie Drive*

Wake County Division 5

PROJECT

*Extension of Jessie Drive in Apex,
NC to NC 55 [E Williams Street] from
Ten Ten Road*

SHEET 1 OF 2

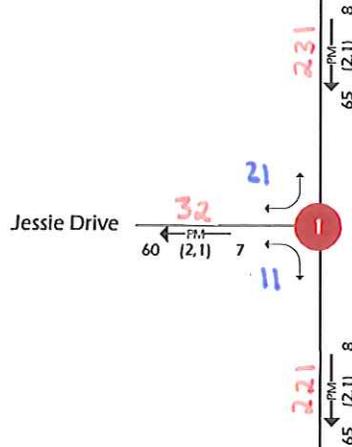
March 1, 2019



NC 55 (East Williams Street)

440
PM
55 (2,1) 10

Ten Ten Road

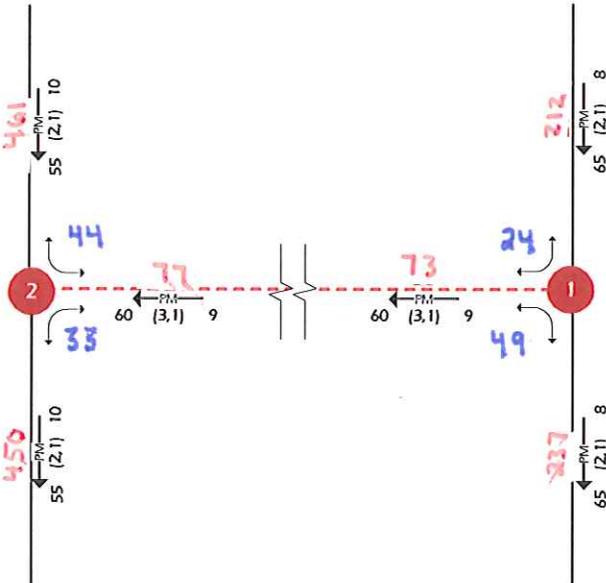


2022
~~2018~~
No-Build

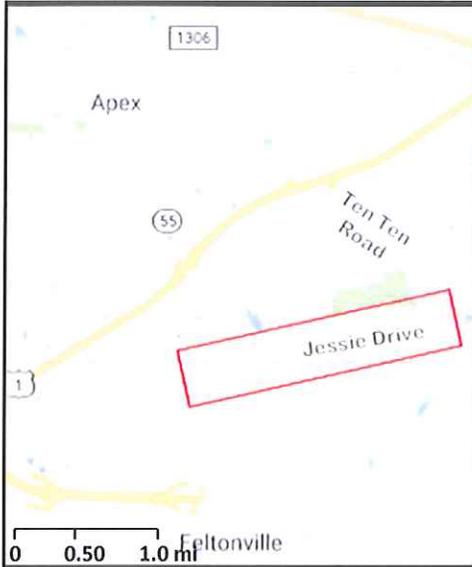
NC 55 (East Williams Street)

461
PM
55 (2,1) 10

Ten Ten Road



2022
~~2018~~
Build



*Jessie Drive
Improvements and
Extension Feasibility
Study*

Future Year
~~2045~~ 2035

Vehicles Per Day in 100s 1- Less than 50 VPD

DHV $\xrightarrow{\text{PM}}$ (d,t) D

- DHV Design Hourly Volume (%) = K30
- PM PM Peak Period
- D Peak Hour Directional Split (%)
- Indicates Direction of D
- (d,t) Dual, TT-STs (%)

- Existing Roadway
- Road Widening
- - - Proposed Roadway

EXTENTS

NC 55 (E Williams Street) between US Route 1 and NC 540; Ten Ten Road at Jessie Drive

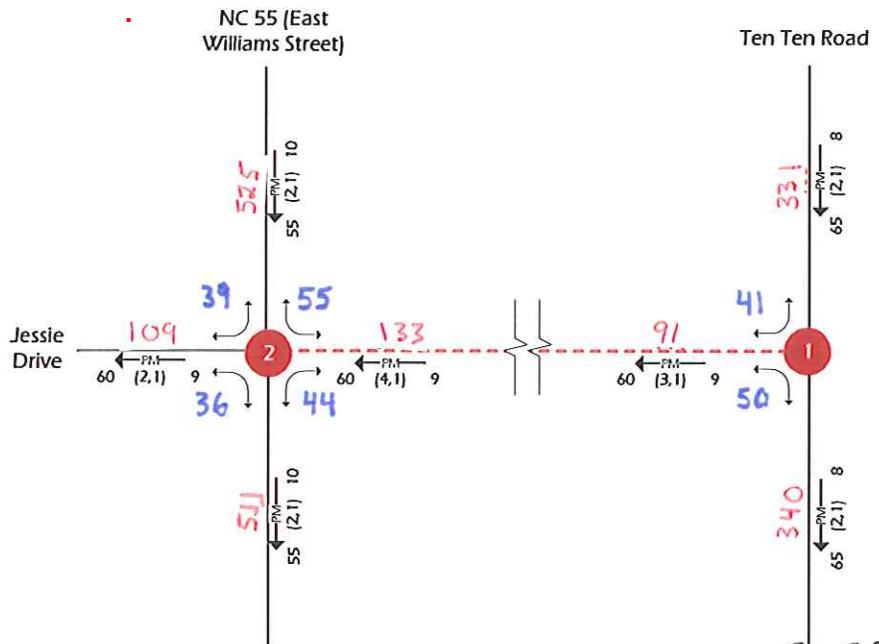
Wake County Division 5

PROJECT

Extension of Jessie Drive in Apex, NC to NC 55 (E Williams Street) from Ten Ten Road

SHEET 2 OF 2

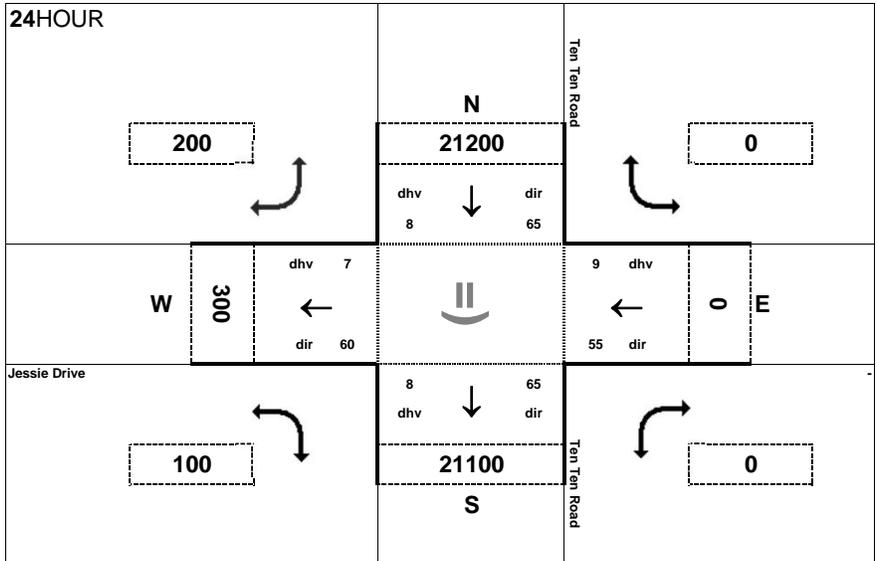
March 1, 2019



2035

**2045
Build**

Peak Hour Volume Breakout Reports

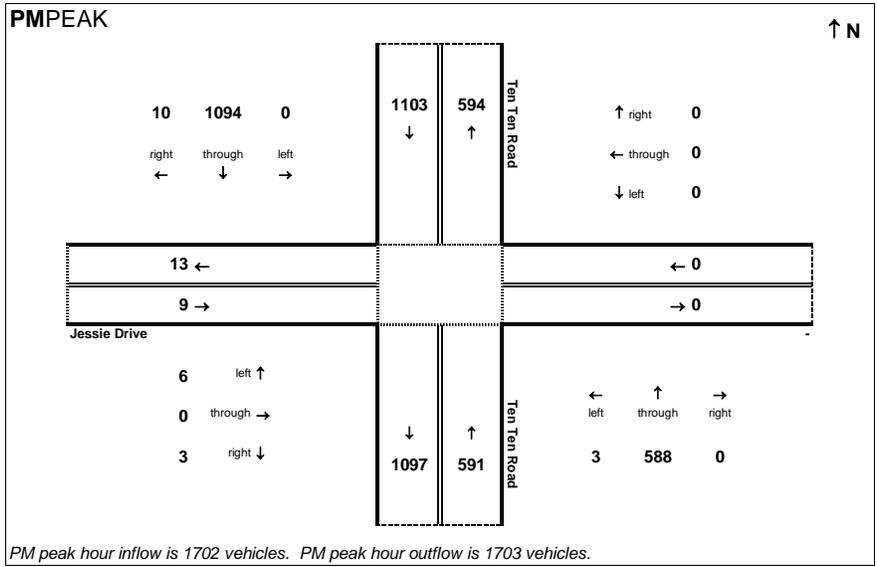
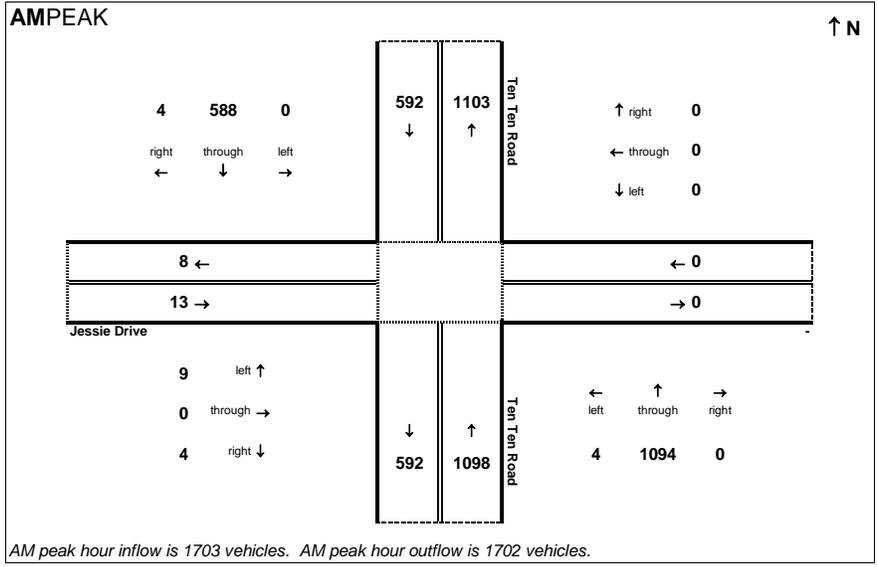


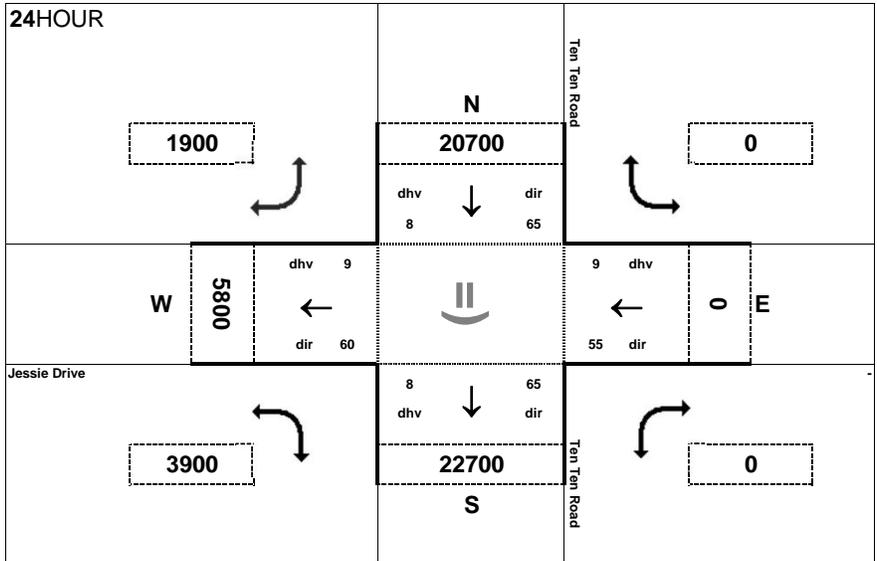
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2018 No Build

Project:
Jessie Drive Extension Feasibility



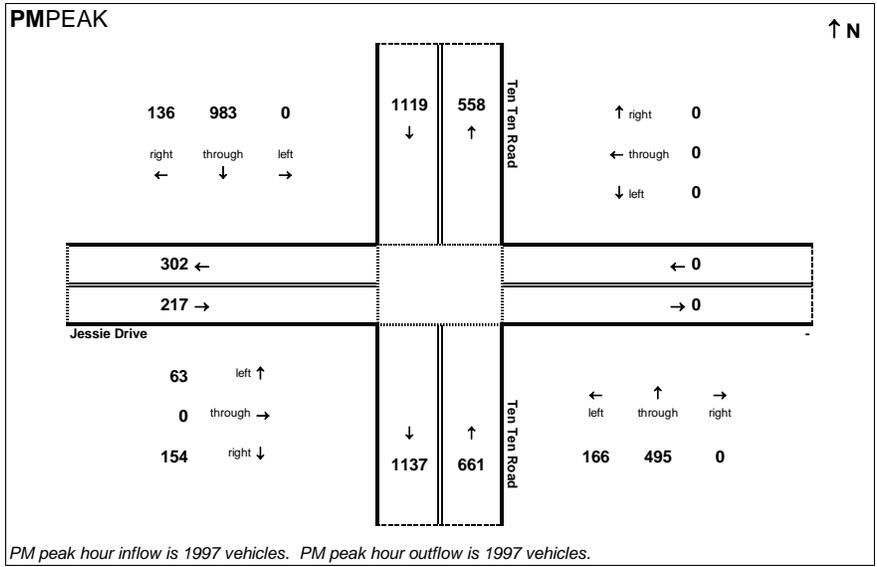
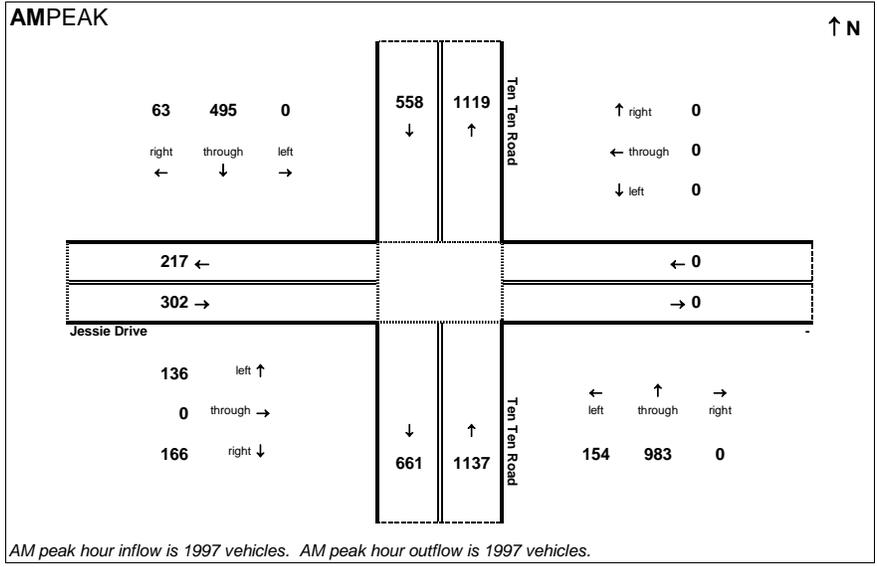


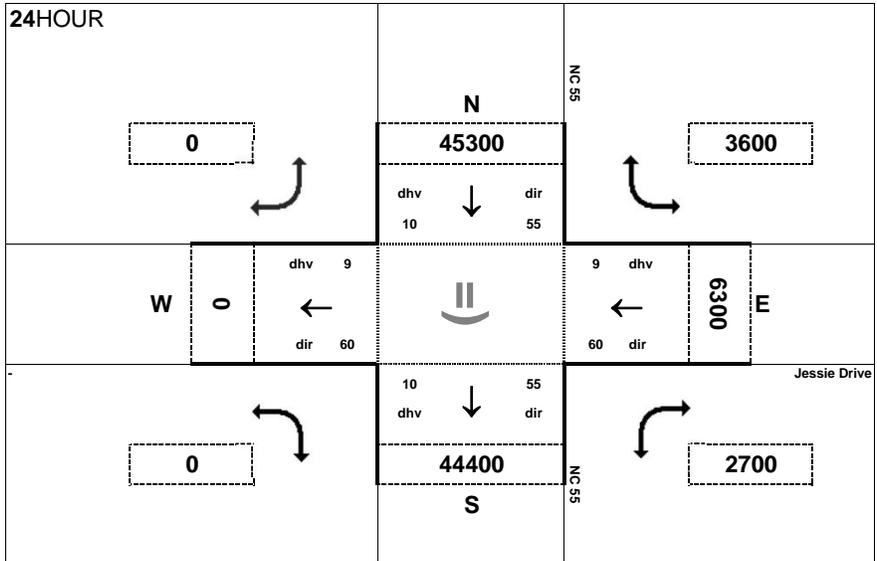
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2018 Build

Project:
Jessie Drive Extension Feasibility



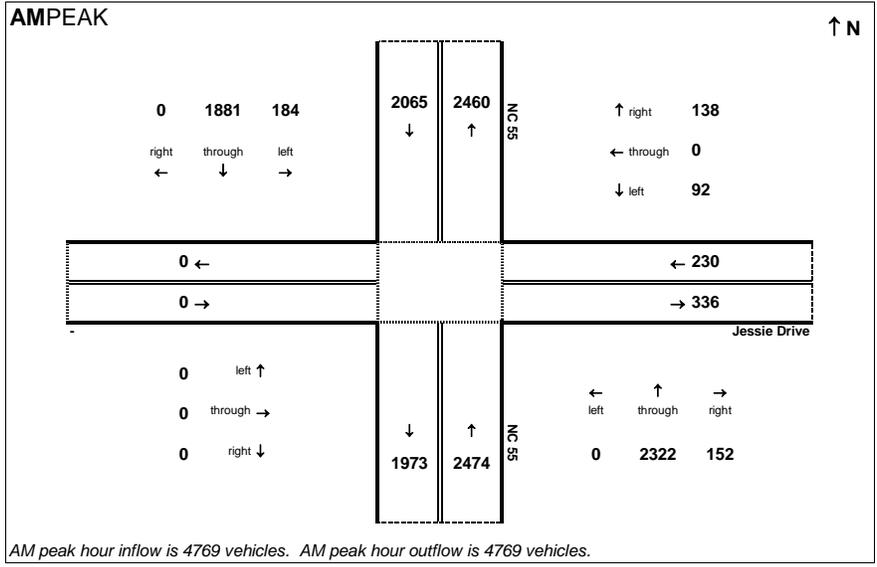


Peak Hour Volume Breakouts Report:
 NC 55 (East Williams Street) and Jessie Drive

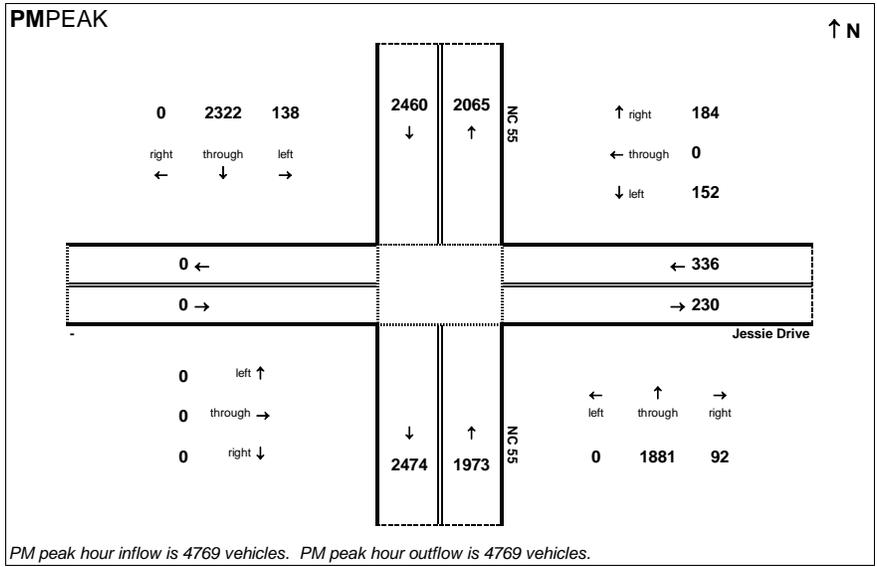
Traffic Forecast Release Date:
 March-19

Traffic Data Year:
 2018 Build

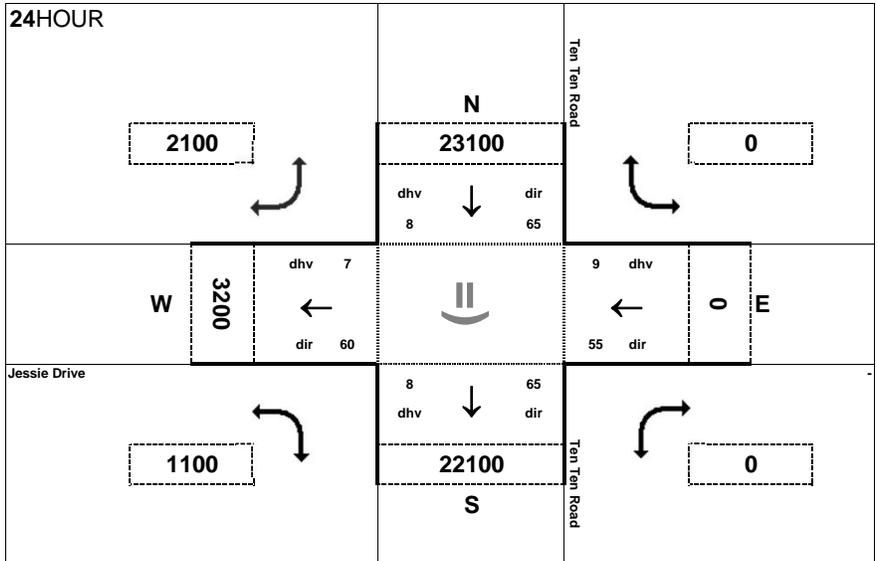
Project:
 Jessie Drive Extension Feasibility



AM peak hour inflow is 4769 vehicles. AM peak hour outflow is 4769 vehicles.



PM peak hour inflow is 4769 vehicles. PM peak hour outflow is 4769 vehicles.

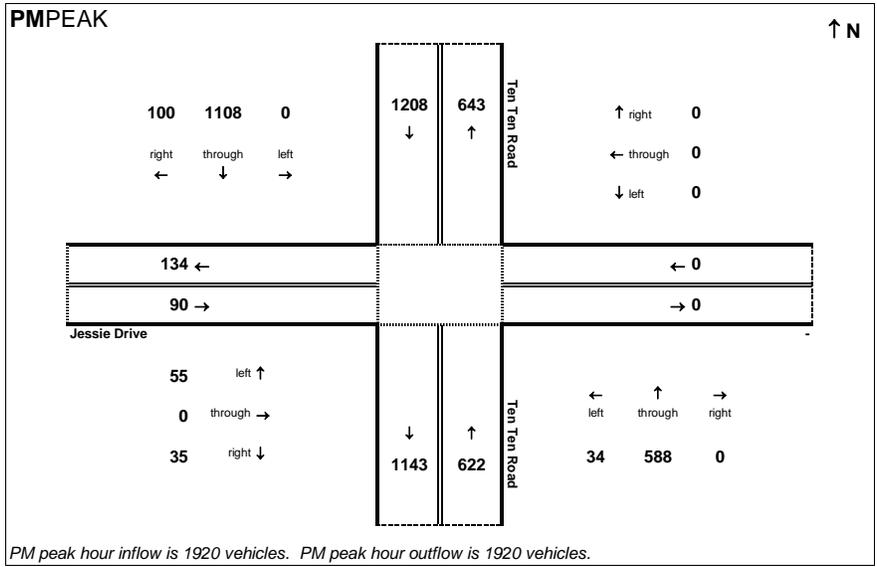
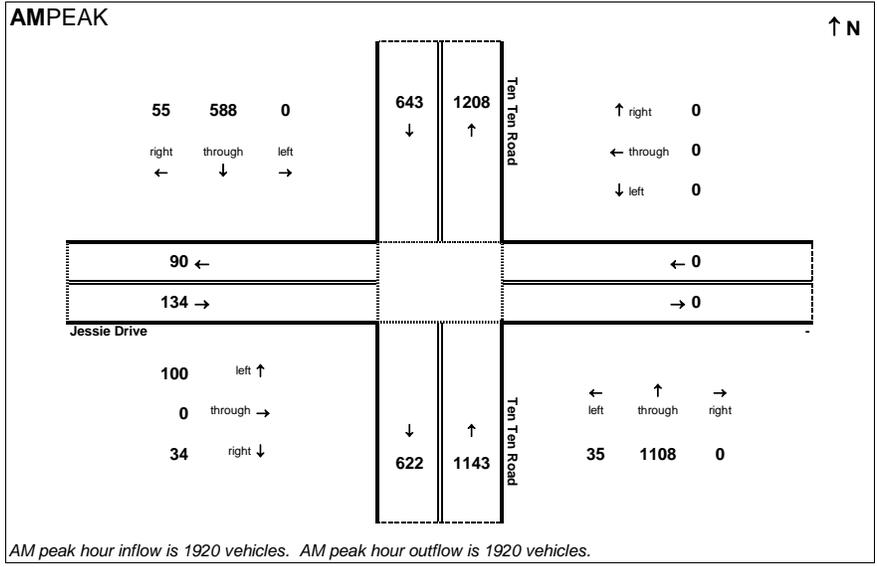


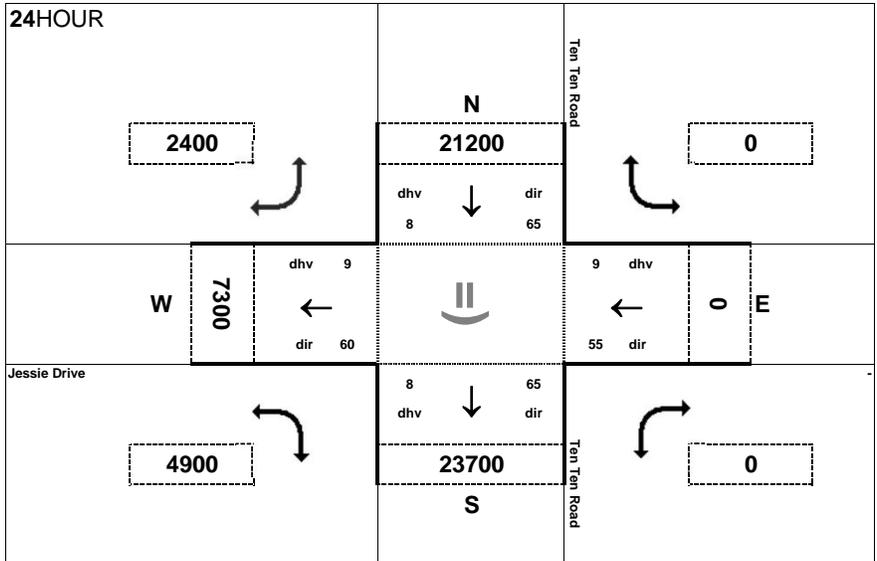
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2022 No Build

Project:
Jessie Drive Extension Feasibility



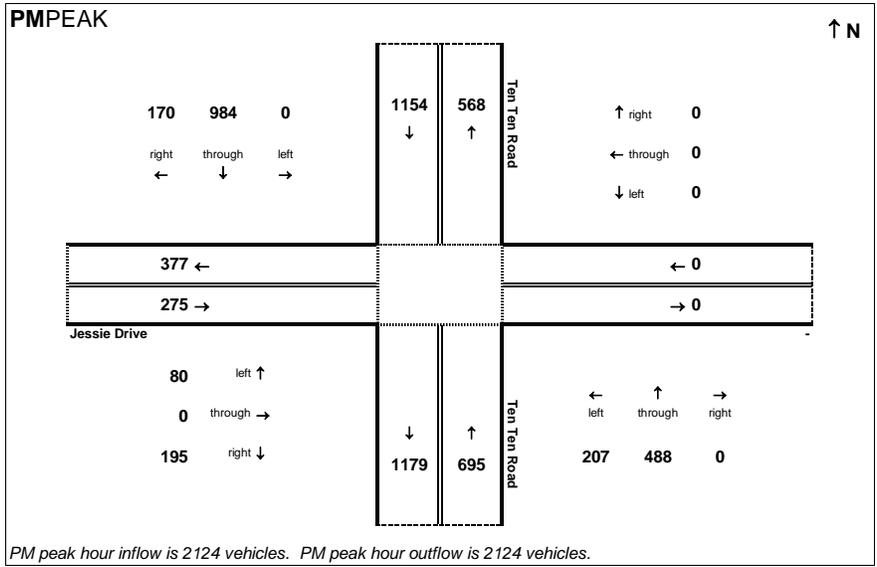
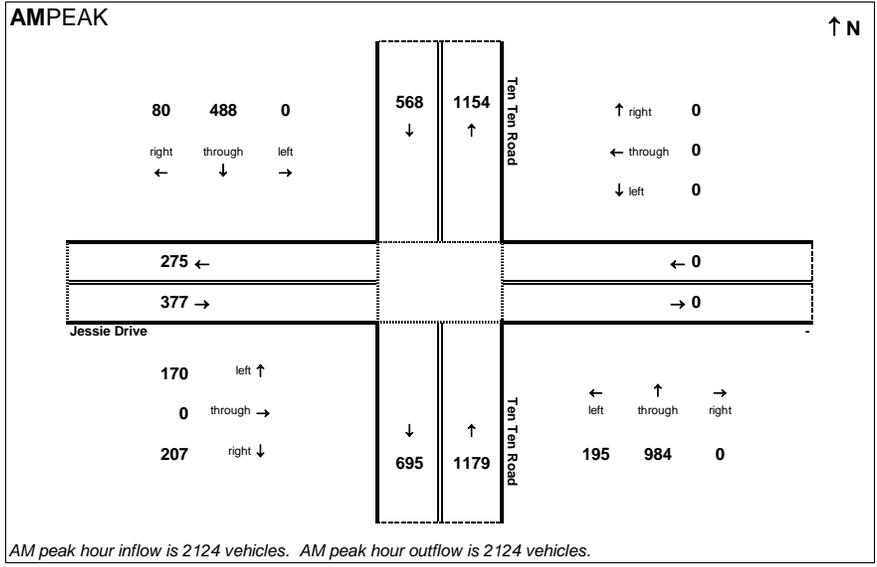


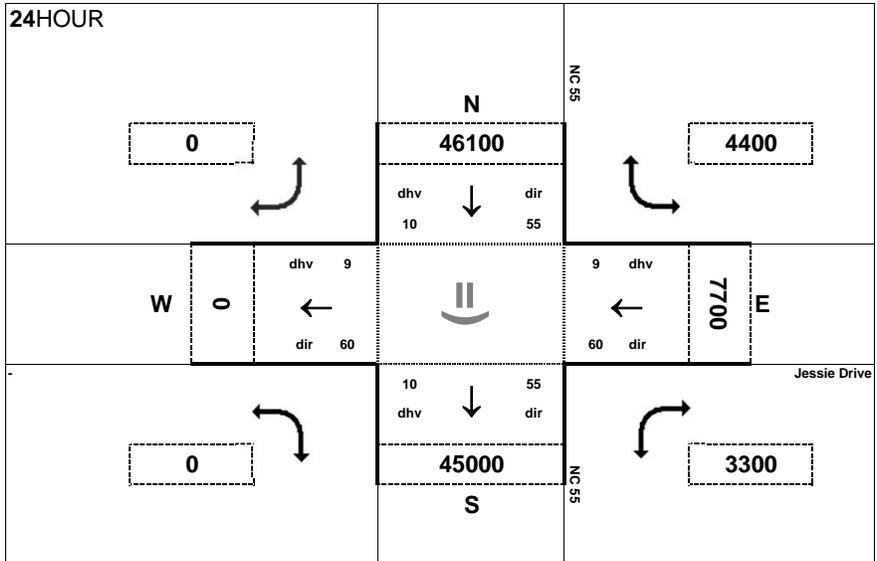
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2022 Build

Project:
Jessie Drive Extension Feasibility



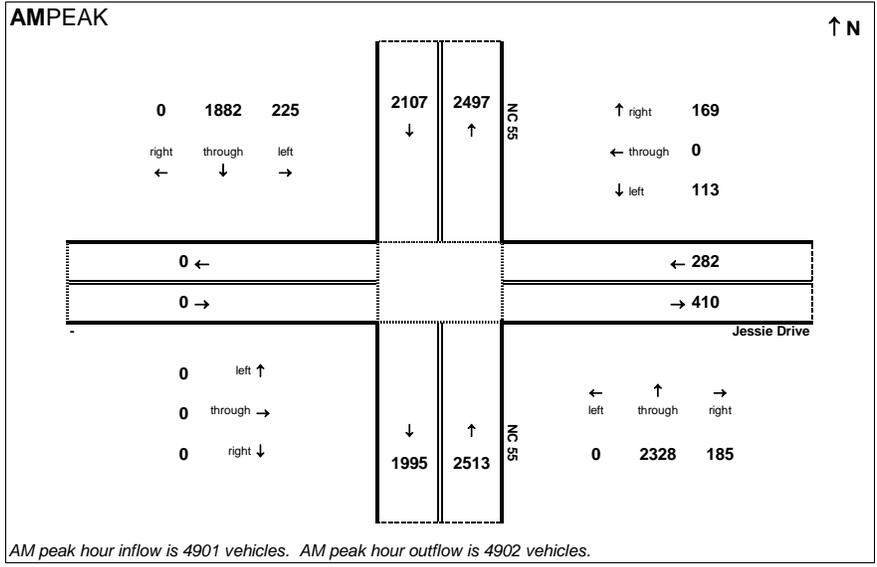


Peak Hour Volume Breakouts Report:
 NC 55 (East Williams Street) and Jessie Drive

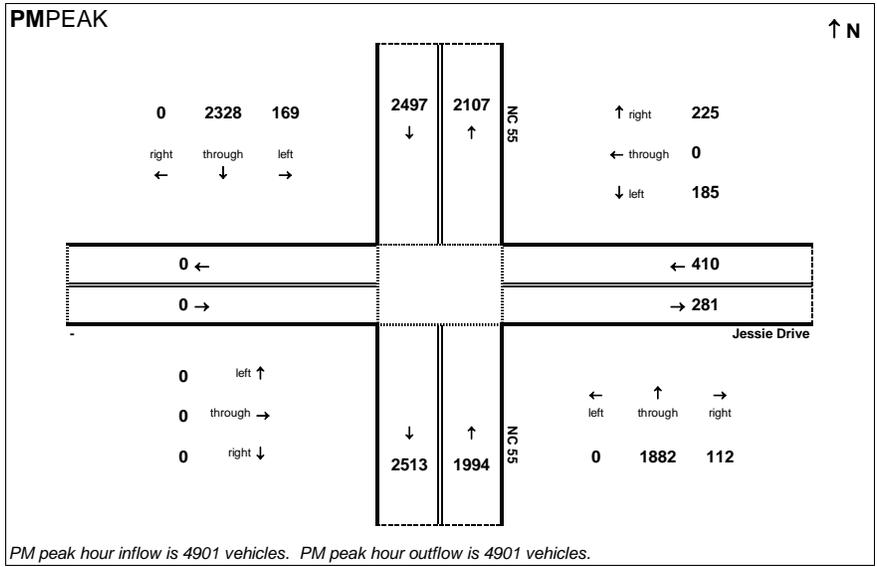
Traffic Forecast Release Date:
 March-19

Traffic Data Year:
 2022 Build

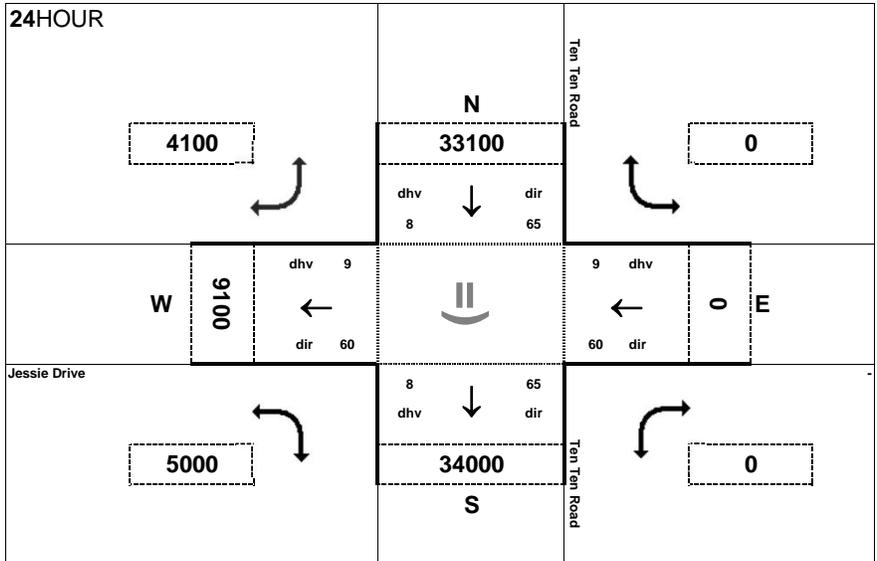
Project:
 Jessie Drive Extension Feasibility



AM peak hour inflow is 4901 vehicles. AM peak hour outflow is 4902 vehicles.



PM peak hour inflow is 4901 vehicles. PM peak hour outflow is 4901 vehicles.

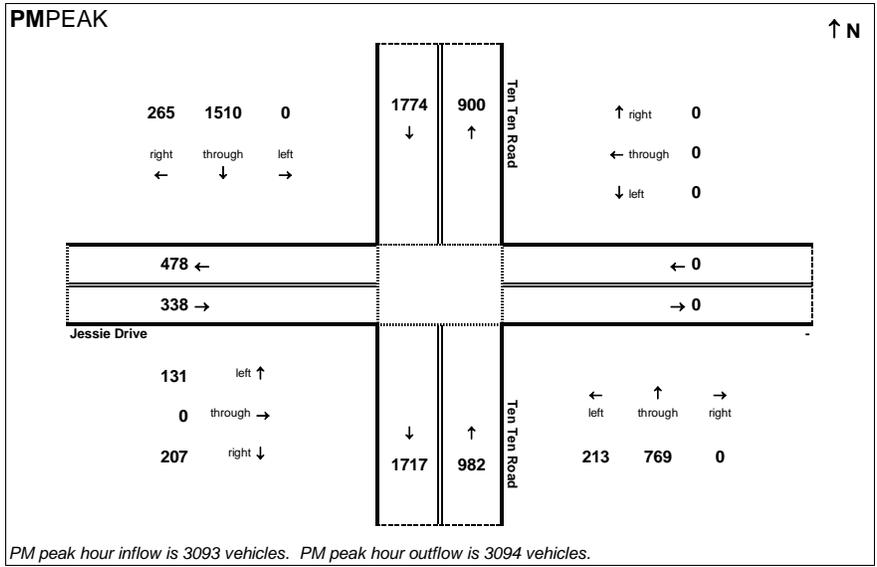
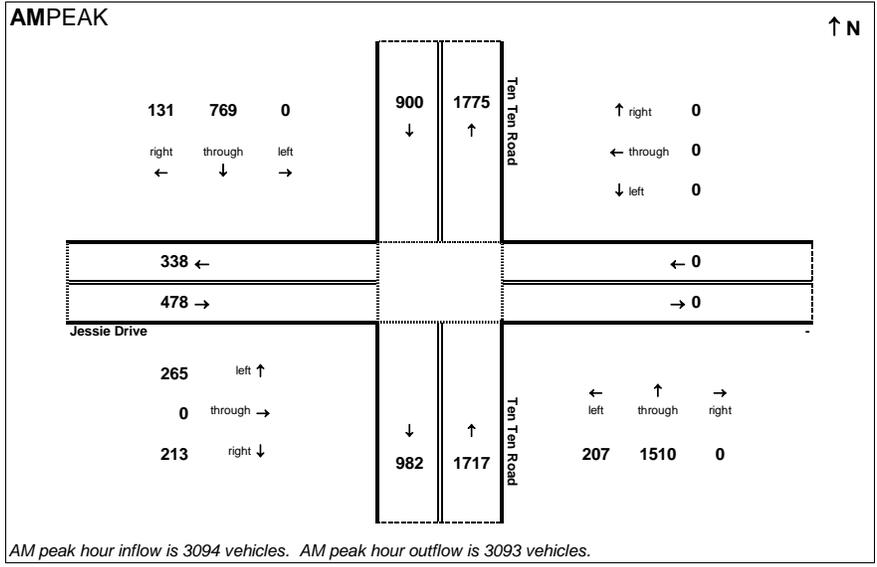


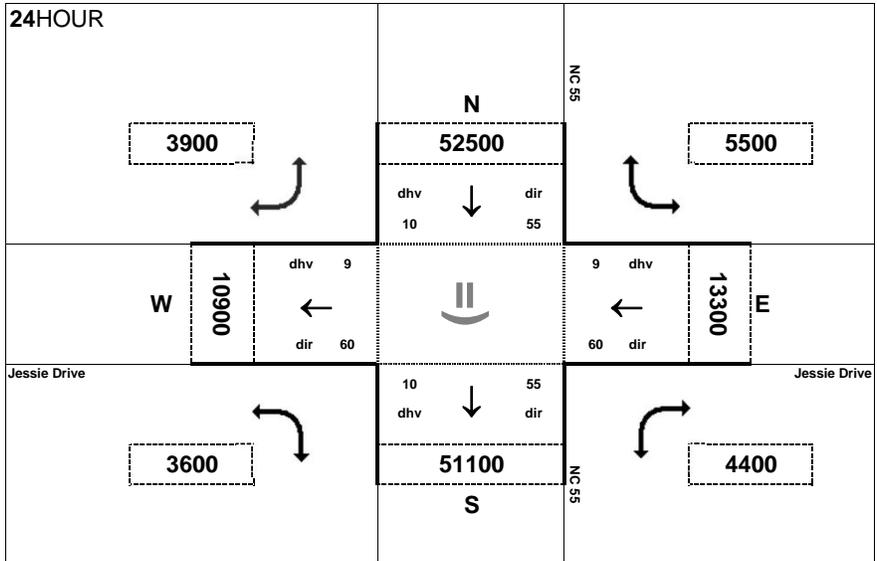
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2035 Build

Project:
Jessie Drive Extension Feasibility



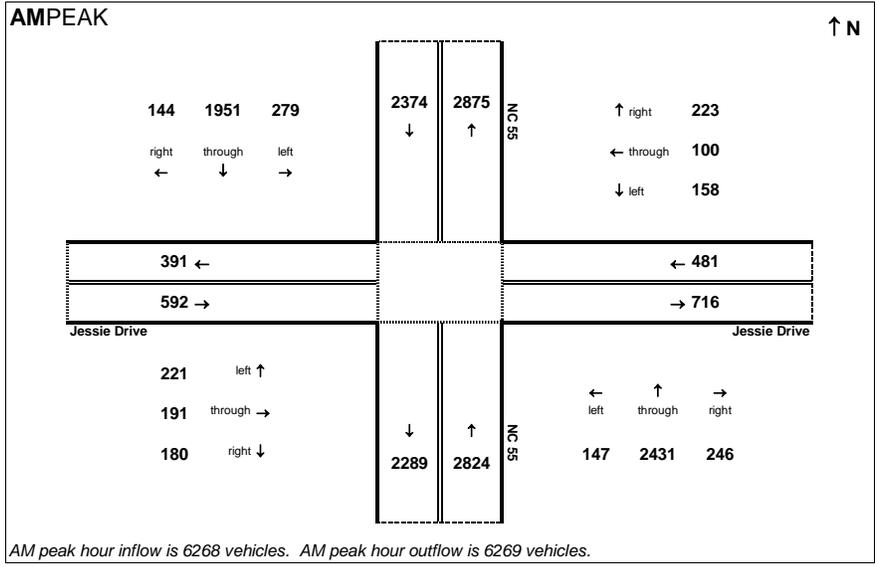


Peak Hour Volume Breakouts Report:
 NC 55 (East Williams Street) and Jessie Drive

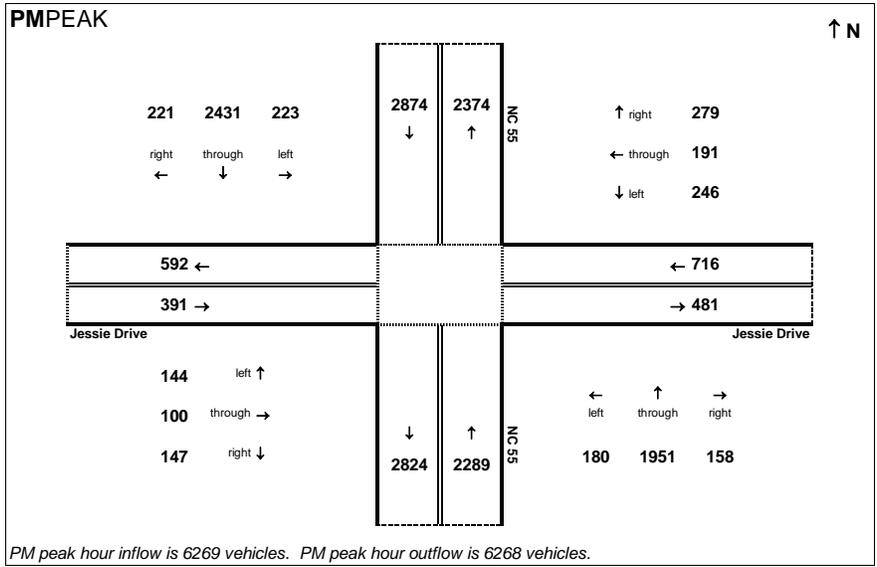
Traffic Forecast Release Date:
 March-19

Traffic Data Year:
 2035 Build

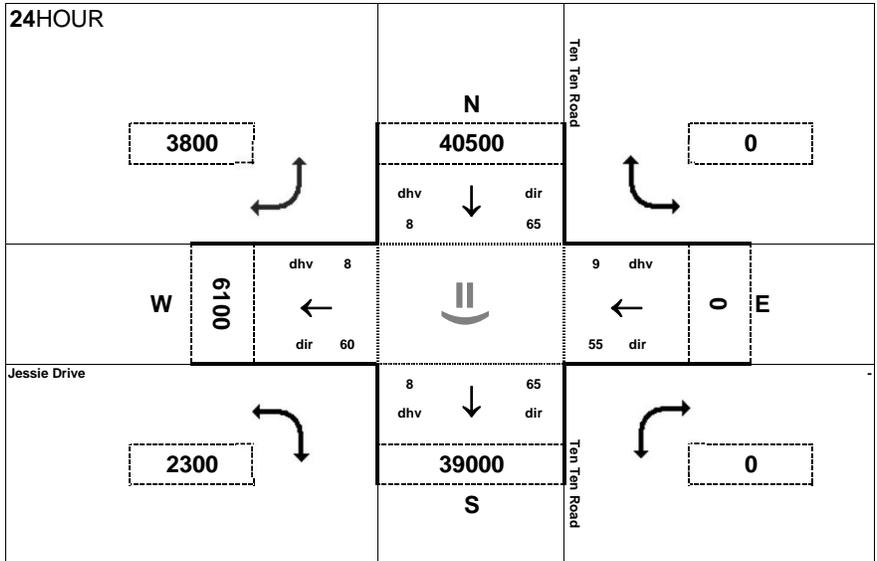
Project:
 Jessie Drive Extension Feasibility



AM peak hour inflow is 6268 vehicles. AM peak hour outflow is 6269 vehicles.



PM peak hour inflow is 6269 vehicles. PM peak hour outflow is 6268 vehicles.

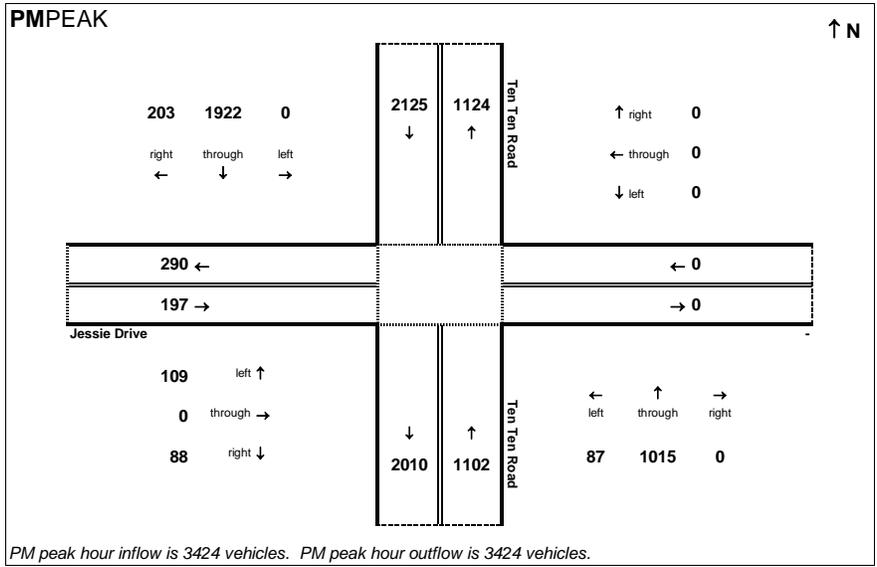
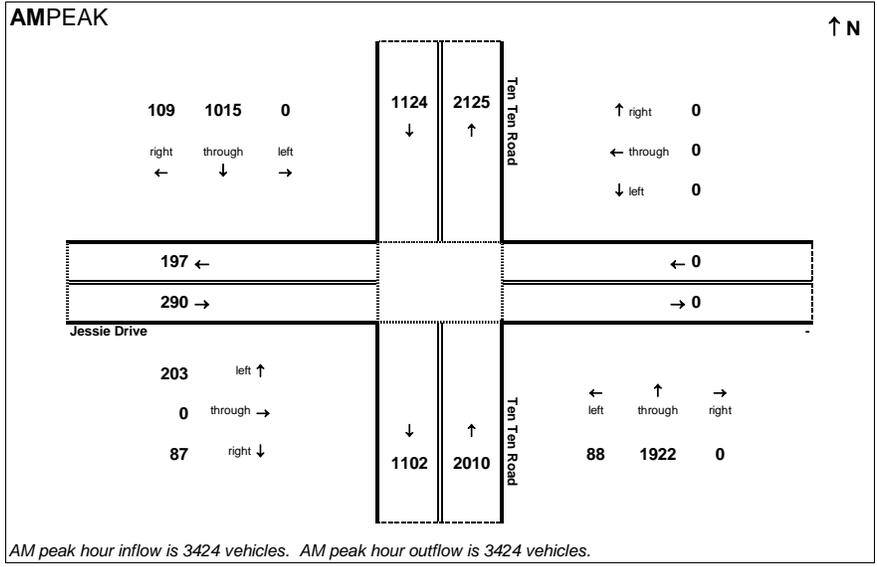


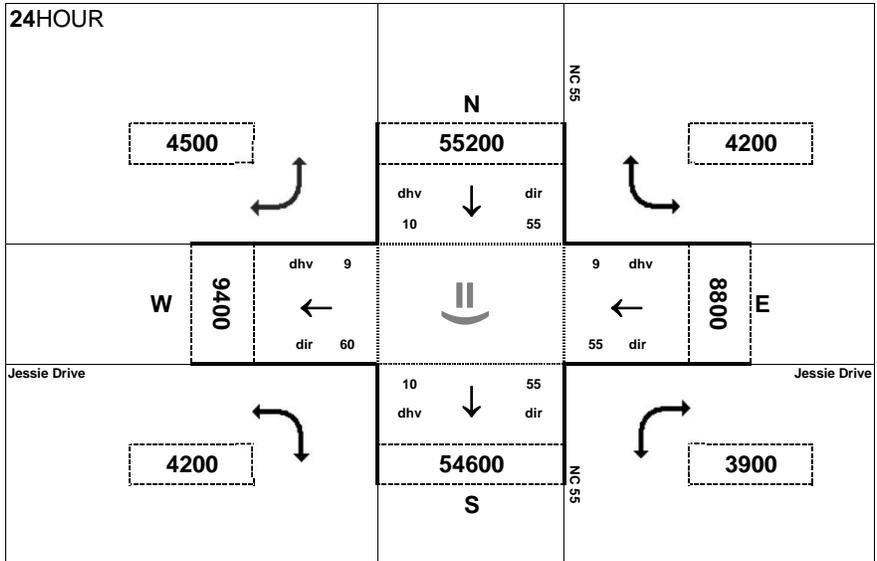
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2045 No Build

Project:
Jessie Drive Extension Feasibility



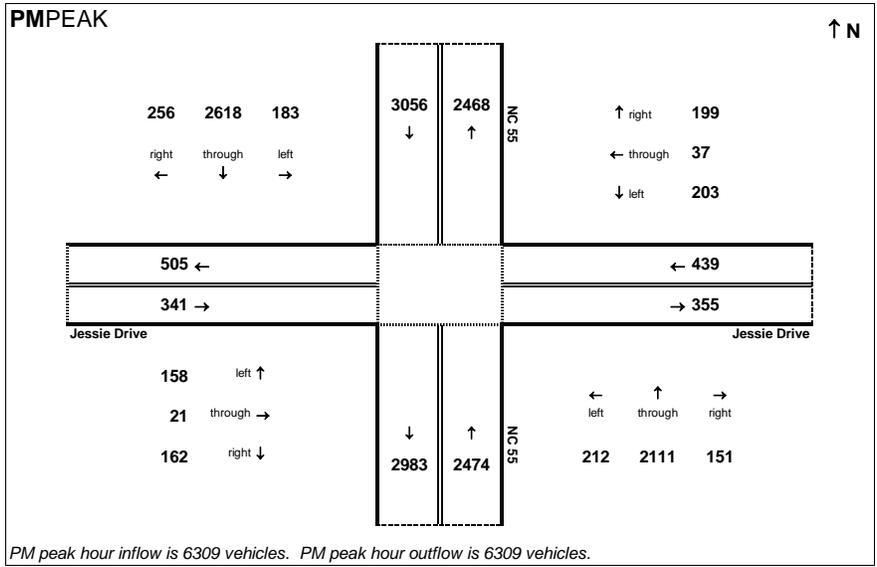
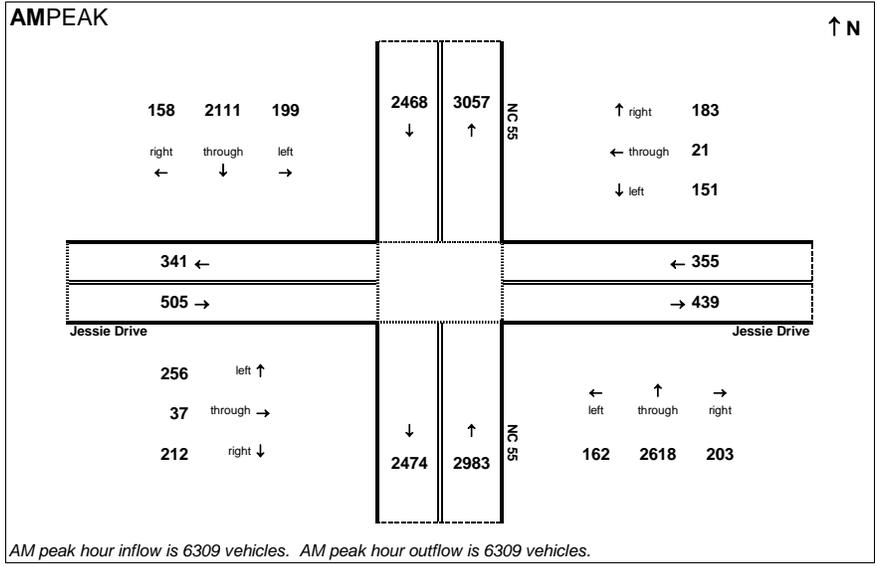


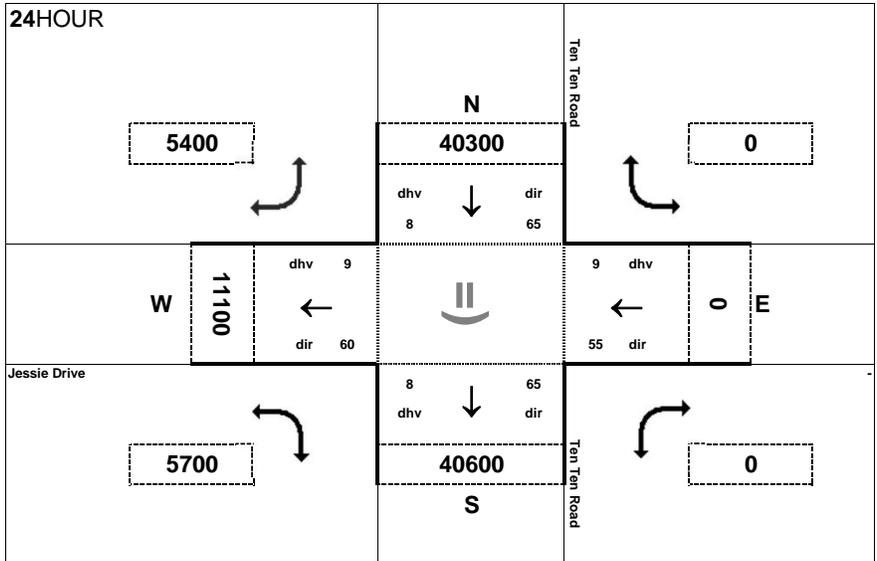
Peak Hour Volume Breakouts Report:
 NC 55 (East Williams Street) and Jessie Drive

Traffic Forecast Release Date:
 March-19

Traffic Data Year:
 2045 No Build

Project:
 Jessie Drive Extension Feasibility



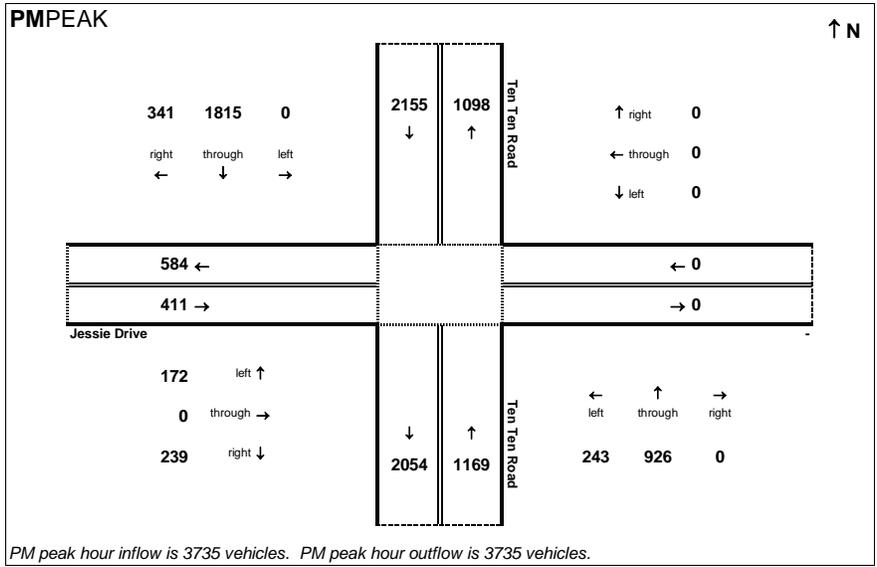
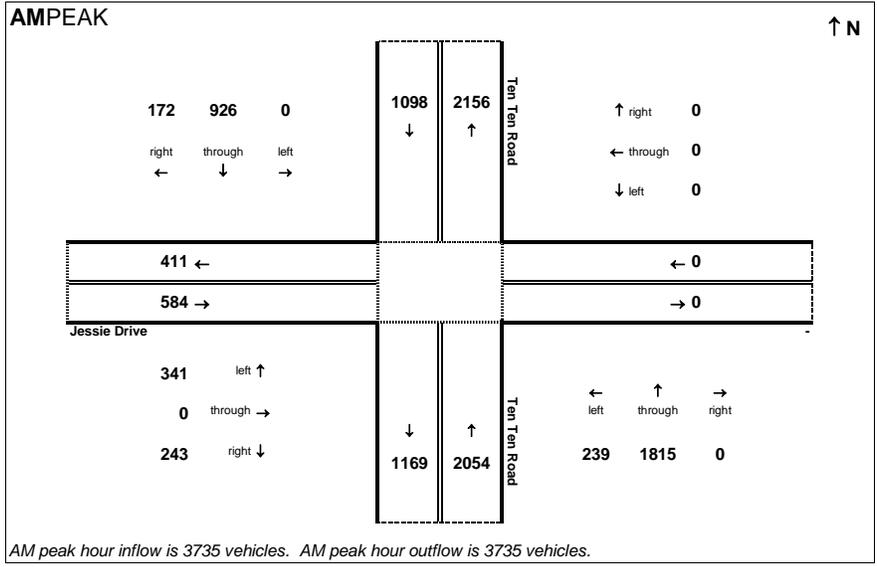


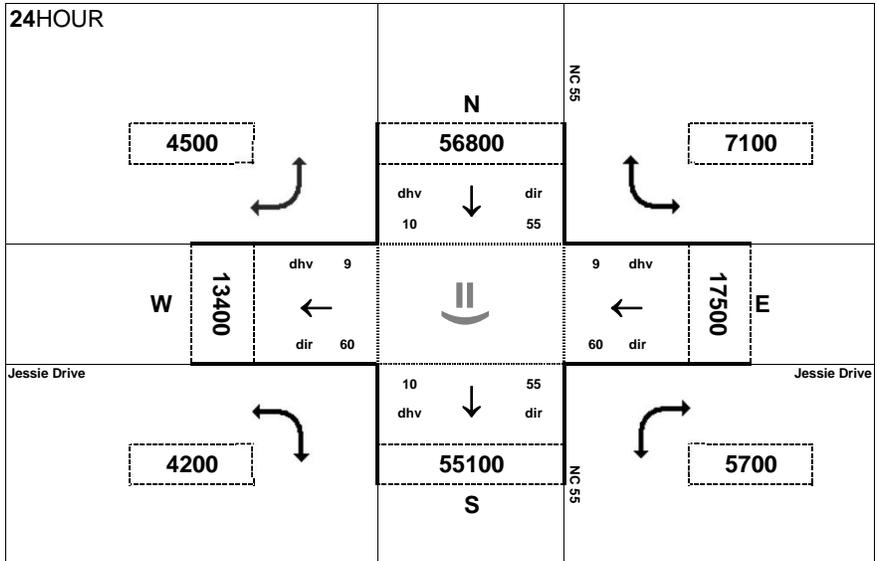
Peak Hour Volume Breakouts Report:
Ten Ten Road and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2045 Build

Project:
Jessie Drive Extension Feasibility



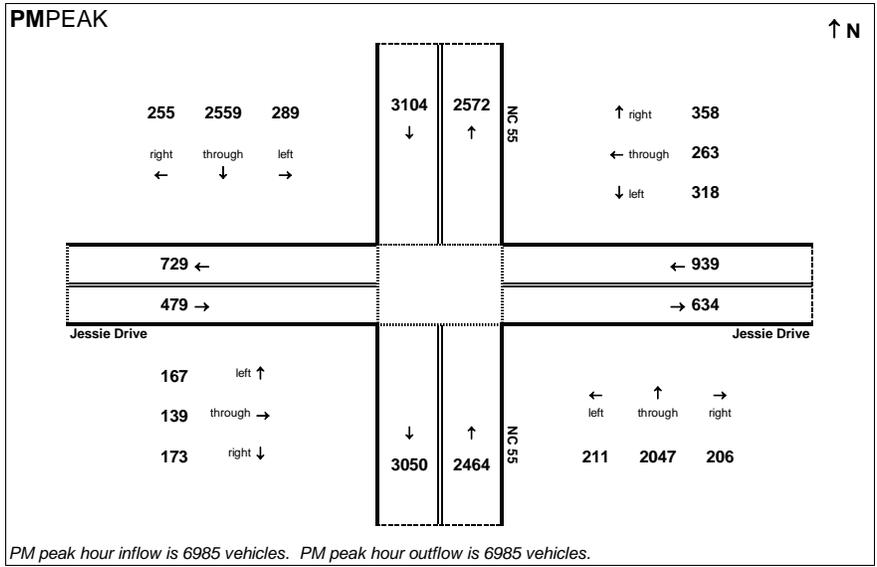
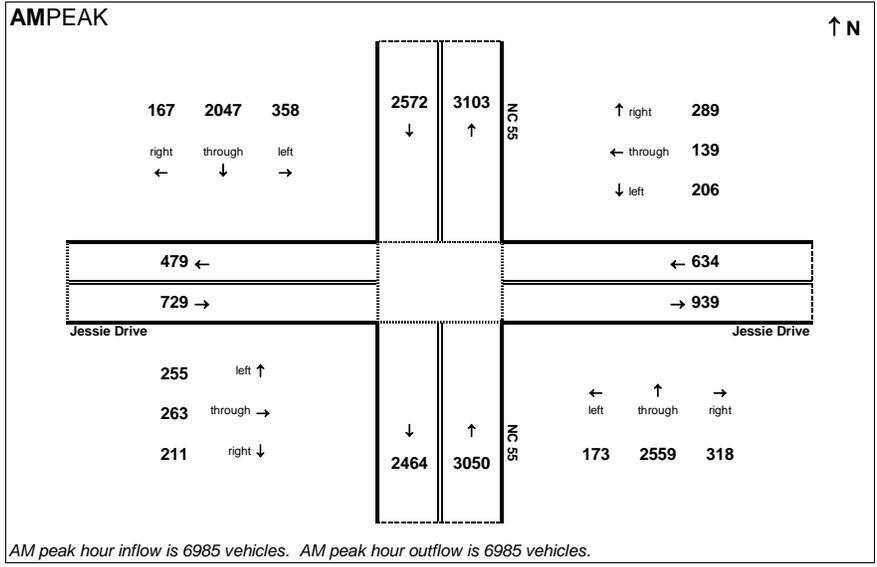


Peak Hour Volume Breakouts Report:
NC 55 (East Williams Street) and Jessie Drive

Traffic Forecast Release Date:
March-19

Traffic Data Year:
2045 Build

Project:
Jessie Drive Extension Feasibility



Synchro Reports

2022 No Build

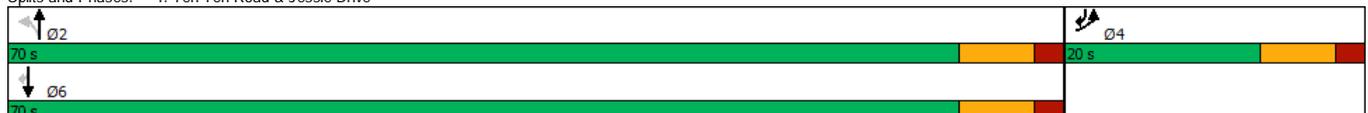


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	100	34	35	1108	588	55
Future Volume (vph)	100	34	35	1108	588	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	50			100
Storage Lanes	1	0	1			1
Taper Length (ft)	25		100			
Satd. Flow (prot)	1718	0	1752	1845	1845	1568
Flt Permitted	0.964		0.361			
Satd. Flow (perm)	1718	0	666	1845	1845	1568
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	16					
Link Speed (mph)	35			45	45	
Link Distance (ft)	932			1079	1353	
Travel Time (s)	18.2			16.3	20.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	149	0	39	1231	653	61
Turn Type	Prot		Perm	NA	NA	pm+ov
Protected Phases	4			2	6	4
Permitted Phases			2			6
Detector Phase	4		2	2	6	4
Switch Phase						
Minimum Initial (s)	7.0		12.0	12.0	12.0	7.0
Minimum Split (s)	14.0		19.0	19.0	19.0	14.0
Total Split (s)	20.0		70.0	70.0	70.0	20.0
Total Split (%)	22.2%		77.8%	77.8%	77.8%	22.2%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		Min	Min	Min	None
Act Effect Green (s)	12.9		60.4	60.4	60.4	83.4
Actuated g/C Ratio	0.15		0.72	0.72	0.72	1.00
v/c Ratio	0.54		0.08	0.92	0.49	0.04
Control Delay	37.6		4.1	23.3	6.5	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	37.6		4.1	23.3	6.5	0.1
LOS	D		A	C	A	A
Approach Delay	37.6			22.7	6.0	
Approach LOS	D			C	A	
Queue Length 50th (ft)	69		5	469	128	0
Queue Length 95th (ft)	129		14	#920	198	0
Internal Link Dist (ft)	852			999	1273	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	325		524	1452	1452	1546
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.46		0.07	0.85	0.45	0.04

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 83.4
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 18.2 Intersection LOS: B
 Intersection Capacity Utilization 74.3% ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive



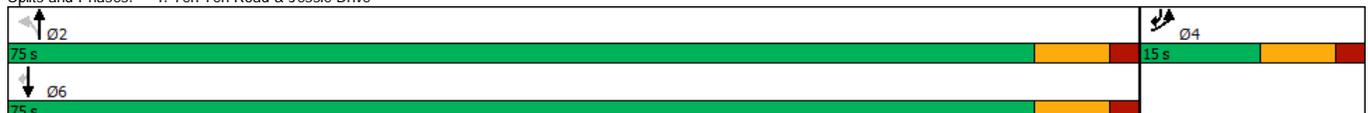


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	35	34	588	1108	100
Future Volume (vph)	55	35	34	588	1108	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	50			100
Storage Lanes	1	0	1			1
Taper Length (ft)	25		100			
Satd. Flow (prot)	1694	0	1752	1845	1845	1568
Flt Permitted	0.970		0.084			
Satd. Flow (perm)	1694	0	155	1845	1845	1568
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	29					
Link Speed (mph)	35			45	45	
Link Distance (ft)	932			1078	1356	
Travel Time (s)	18.2			16.3	20.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	100	0	38	653	1231	111
Turn Type	Prot		Perm	NA	NA	pm+ov
Protected Phases	4			2	6	4
Permitted Phases			2			6
Detector Phase	4		2	2	6	4
Switch Phase						
Minimum Initial (s)	7.0		12.0	12.0	12.0	7.0
Minimum Split (s)	14.0		19.0	19.0	19.0	14.0
Total Split (s)	15.0		75.0	75.0	75.0	15.0
Total Split (%)	16.7%		83.3%	83.3%	83.3%	16.7%
Yellow Time (s)	5.0		5.0	5.0	5.0	5.0
All-Red Time (s)	2.0		2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0		5.0	5.0	5.0	5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None		Min	Min	Min	None
Act Effct Green (s)	9.7		57.6	57.6	57.6	77.6
Actuated g/C Ratio	0.12		0.74	0.74	0.74	1.00
v/c Ratio	0.42		0.33	0.48	0.90	0.07
Control Delay	32.2		11.8	5.1	18.2	0.1
Queue Delay	0.0		0.0	0.0	0.0	0.0
Total Delay	32.2		11.8	5.1	18.2	0.1
LOS	C		B	A	B	A
Approach Delay	32.2			5.5	16.7	
Approach LOS	C			A	B	
Queue Length 50th (ft)	32		5	99	360	0
Queue Length 95th (ft)	88		22	146	#634	0
Internal Link Dist (ft)	852			998	1276	
Turn Bay Length (ft)			50			100
Base Capacity (vph)	248		138	1641	1641	1529
Starvation Cap Reductn	0		0	0	0	0
Spillback Cap Reductn	0		0	0	0	0
Storage Cap Reductn	0		0	0	0	0
Reduced v/c Ratio	0.40		0.28	0.40	0.75	0.07

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 77.6
 Natural Cycle: 70
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 13.8 Intersection LOS: B
 Intersection Capacity Utilization 72.5% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive



2045 No Build

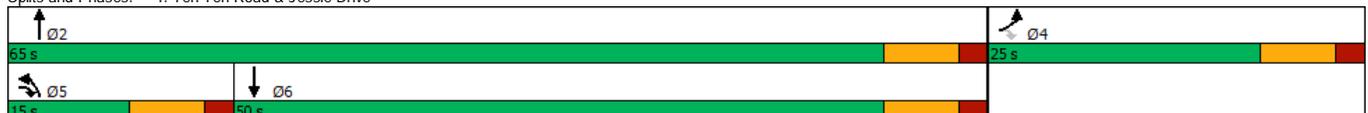


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	203	87	88	1922	1015	109
Future Volume (vph)	203	87	88	1922	1015	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1752	1568	1752	3505	4960	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	4960	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	1901			1026	1457	
Travel Time (s)	37.0			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	226	97	98	2136	1249	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	25.0	15.0	15.0	65.0	50.0	
Total Split (%)	27.8%	16.7%	16.7%	72.2%	55.6%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effect Green (s)	16.9	32.0	10.0	53.8	42.6	
Actuated g/C Ratio	0.21	0.40	0.12	0.66	0.53	
v/c Ratio	0.62	0.16	0.46	0.92	0.48	
Control Delay	38.8	18.6	44.3	19.9	14.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.8	18.6	44.3	19.9	14.2	
LOS	D	B	D	B	B	
Approach Delay	32.8			21.0	14.2	
Approach LOS	C			C	B	
Queue Length 50th (ft)	115	35	52	451	159	
Queue Length 95th (ft)	190	69	104	#645	204	
Internal Link Dist (ft)	1821			946	1377	
Turn Bay Length (ft)		150	400			
Base Capacity (vph)	443	624	221	2650	2828	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.51	0.16	0.44	0.81	0.44	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 81
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 19.7
 Intersection LOS: B
 Intersection Capacity Utilization 72.7%
 ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	199	0	0	0	355	0	2874	240	0	0	0
Future Volume (vph)	0	199	0	0	0	355	0	2874	240	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2760	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2760	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		177			2008			213			626	
Travel Time (s)		3.4			39.1			3.2			9.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	221	0	0	0	394	0	3193	267	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		25.0				25.0		65.0	65.0			
Total Split (%)		27.8%				27.8%		72.2%	72.2%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effct Green (s)		18.5				18.5		61.5	61.5			
Actuated g/C Ratio		0.21				0.21		0.68	0.68			
v/c Ratio		0.58				0.69		0.93	0.25			
Control Delay		36.7				40.0		8.0	3.7			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		36.7				40.0		8.0	3.7			
LOS		D				D		A	A			
Approach Delay		36.7			40.0			7.6				
Approach LOS		D			D			A				
Queue Length 50th (ft)		127				116		142	27			
Queue Length 95th (ft)		m178				169		m154	m31			
Internal Link Dist (ft)		97			1928			133		546		
Turn Bay Length (ft)						200						
Base Capacity (vph)		410				613		3441	1071			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.54				0.64		0.93	0.25			

Intersection Summary
 Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 4 (4%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 12.4
 Intersection LOS: B
 Intersection Capacity Utilization 121.1%
 ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	172	0	0	0	0	2468
Future Volume (vph)	172	0	0	0	0	2468
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		555			1234
Travel Time (s)	1.9		8.4			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	0	0	0	0	2742
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	20.0					70.0
Total Split (%)	22.2%					77.8%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	14.3					65.7
Actuated g/C Ratio	0.16					0.73
v/c Ratio	0.69					0.75
Control Delay	45.5					9.0
Queue Delay	0.0					0.0
Total Delay	45.5					9.0
LOS	D					A
Approach Delay	45.5					9.0
Approach LOS	D					A
Queue Length 50th (ft)	48					291
Queue Length 95th (ft)	m106					346
Internal Link Dist (ft)	20		475			1154
Turn Bay Length (ft)						
Base Capacity (vph)	292					3678
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.65					0.75

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 3 (3%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 11.3 Intersection LOS: B
 Intersection Capacity Utilization 114.3% ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘		↑						↑↑↑	↗
Traffic Volume (vph)	0	0	505	0	162	0	0	0	0	0	2262	179
Future Volume (vph)	0	0	505	0	162	0	0	0	0	0	2262	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	561	0	180	0	0	0	0	0	2513	199
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			30.0		30.0						60.0	60.0
Total Split (%)			33.3%		33.3%						66.7%	66.7%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			23.4		23.4						56.6	56.6
Actuated g/C Ratio			0.26		0.26						0.63	0.63
v/c Ratio			0.78		0.38						0.79	0.20
Control Delay			39.3		27.0						8.8	6.2
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			39.3		27.0						8.8	6.2
LOS			D		C						A	A
Approach Delay		39.3			27.0						8.6	
Approach LOS		D			C						A	
Queue Length 50th (ft)			164		99						173	32
Queue Length 95th (ft)			229		m99						189	m43
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			766		512						3168	986
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.73		0.35						0.79	0.20

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 2 (2%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.79
 Intersection Signal Delay: 14.6
 Intersection LOS: B
 Intersection Capacity Utilization 127.5%
 ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↖			↑↑↑		
Traffic Volume (vph)	293	0	0	2983	0	0
Future Volume (vph)	293	0	0	2983	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	326	0	0	3314	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	25.0			65.0		
Total Split (%)	27.8%			72.2%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effect Green (s)	19.6			60.4		
Actuated g/C Ratio	0.22			0.67		
v/c Ratio	0.86			0.98		
Control Delay	44.2			26.7		
Queue Delay	0.0			0.0		
Total Delay	44.2			26.7		
LOS	D			C		
Approach Delay	44.2			26.7		
Approach LOS	D			C		
Queue Length 50th (ft)	73			593		
Queue Length 95th (ft)	m#250			#806		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	389			3382		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.84			0.98		

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 28.3 Intersection LOS: C
 Intersection Capacity Utilization 82.2% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



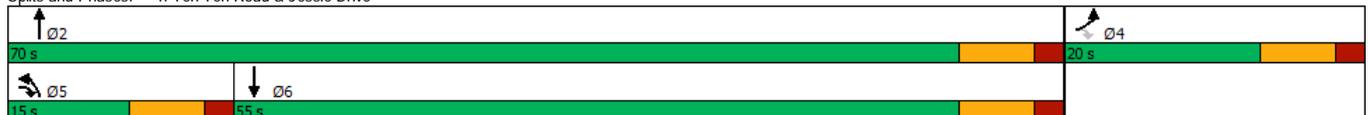


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	109	88	87	1015	1922	203
Future Volume (vph)	109	88	87	1015	1922	203
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	150	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1752	1568	1752	3505	4965	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1752	1568	1752	3505	4965	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	1901			1026	1457	
Travel Time (s)	37.0			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	121	98	97	1128	2362	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	20.0	15.0	15.0	70.0	55.0	
Total Split (%)	22.2%	16.7%	16.7%	77.8%	61.1%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effect Green (s)	12.6	24.1	9.9	65.2	49.1	
Actuated g/C Ratio	0.15	0.29	0.12	0.78	0.59	
v/c Ratio	0.46	0.22	0.47	0.41	0.81	
Control Delay	39.6	22.8	44.9	4.7	17.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	39.6	22.8	44.9	4.7	17.7	
LOS	D	C	D	A	B	
Approach Delay	32.1			7.9	17.7	
Approach LOS	C			A	B	
Queue Length 50th (ft)	62	39	52	105	370	
Queue Length 95th (ft)	116	77	102	148	465	
Internal Link Dist (ft)	1821			946	1377	
Turn Bay Length (ft)		150	400			
Base Capacity (vph)	319	458	212	2767	3015	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.38	0.21	0.46	0.41	0.78	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 83.3
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 15.4
 Intersection LOS: B
 Intersection Capacity Utilization 66.0%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	183	0	0	0	439	0	2269	172	0	0	0
Future Volume (vph)	0	183	0	0	0	439	0	2269	172	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2760	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2760	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45				45
Link Distance (ft)		177			2008			213				626
Travel Time (s)		3.4			39.1			3.2				9.5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	203	0	0	0	488	0	2521	191	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		30.0				30.0		60.0	60.0			
Total Split (%)		33.3%				33.3%		66.7%	66.7%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effct Green (s)		22.3				22.3		57.7	57.7			
Actuated g/C Ratio		0.25				0.25		0.64	0.64			
v/c Ratio		0.44				0.71		0.78	0.19			
Control Delay		25.2				36.9		7.4	5.5			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		25.2				36.9		7.4	5.5			
LOS		C				D		A	A			
Approach Delay		25.2				36.9		7.3				
Approach LOS		C				D		A				
Queue Length 50th (ft)		107				140		134	23			
Queue Length 95th (ft)		m107				196		170	m37			
Internal Link Dist (ft)		97				1928		133			546	
Turn Bay Length (ft)						200						
Base Capacity (vph)		512				766		3226	1004			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.40				0.64		0.78	0.19			

Intersection Summary
 Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 1 (1%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 12.6
 Intersection LOS: B
 Intersection Capacity Utilization 125.4%
 ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	240	0	0	0	0	3057
Future Volume (vph)	240	0	0	0	0	3057
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		555			1234
Travel Time (s)	1.9		8.4			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	267	0	0	0	0	3397
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	21.0					69.0
Total Split (%)	23.3%					76.7%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	16.0					64.0
Actuated g/C Ratio	0.18					0.71
v/c Ratio	0.86					0.95
Control Delay	42.2					19.3
Queue Delay	0.0					0.0
Total Delay	42.2					19.3
LOS	D					B
Approach Delay	42.2					19.3
Approach LOS	D					B
Queue Length 50th (ft)	34					531
Queue Length 95th (ft)	#239					#660
Internal Link Dist (ft)	20		475			1154
Turn Bay Length (ft)						
Base Capacity (vph)	311					3583
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.86					0.95

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.95
 Intersection Signal Delay: 21.0 Intersection LOS: C
 Intersection Capacity Utilization 114.3% ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑		↑						↑↑↑	↑
Traffic Volume (vph)	0	0	341	0	212	0	0	0	0	0	2821	293
Future Volume (vph)	0	0	341	0	212	0	0	0	0	0	2821	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	379	0	236	0	0	0	0	0	3134	326
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			25.0		25.0						65.0	65.0
Total Split (%)			27.8%		27.8%						72.2%	72.2%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			18.3		18.3						61.7	61.7
Actuated g/C Ratio			0.20		0.20						0.69	0.69
v/c Ratio			0.68		0.63						0.91	0.30
Control Delay			39.5		39.4						9.5	5.4
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			39.5		39.4						9.5	5.4
LOS			D		D						A	A
Approach Delay		39.5			39.4						9.1	
Approach LOS		D			D						A	
Queue Length 50th (ft)			111		145						187	44
Queue Length 95th (ft)			163		m188						m255	m57
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			613		410						3454	1075
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.62		0.58						0.91	0.30

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 13.7
 Intersection LOS: B
 Intersection Capacity Utilization 119.6%
 ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations				↑↑↑		
Traffic Volume (vph)	179	0	0	2474	0	0
Future Volume (vph)	179	0	0	2474	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	199	0	0	2749	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	25.0			65.0		
Total Split (%)	27.8%			72.2%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effect Green (s)	16.8			63.2		
Actuated g/C Ratio	0.19			0.70		
v/c Ratio	0.61			0.78		
Control Delay	45.9			11.3		
Queue Delay	0.0			0.0		
Total Delay	45.9			11.3		
LOS	D			B		
Approach Delay	45.9			11.3		
Approach LOS	D			B		
Queue Length 50th (ft)	63			330		
Queue Length 95th (ft)	96			441		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	389			3537		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.51			0.78		

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	90
Offset:	0 (0%), Referenced to phase 2:NBT, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	0.78
Intersection Signal Delay:	13.7
Intersection LOS:	B
Intersection Capacity Utilization:	66.1%
ICU Level of Service:	C
Analysis Period (min):	15

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



2022 Build – 2 Southbound NC 55 Lanes

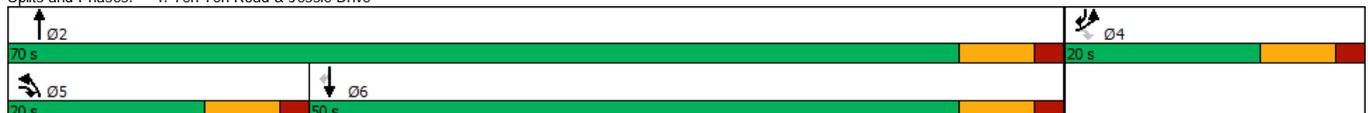


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	170	207	195	984	488	80
Future Volume (vph)	170	207	195	984	488	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	300			100
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	1845	1845	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	1845	1845	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8276			1026	1457	
Travel Time (s)	161.2			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	230	217	1093	542	89
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	20.0	20.0	70.0	50.0	20.0
Total Split (%)	22.2%	22.2%	22.2%	77.8%	55.6%	22.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effect Green (s)	13.3	32.4	13.9	52.1	32.9	51.5
Actuated g/C Ratio	0.18	0.43	0.18	0.69	0.43	0.68
v/c Ratio	0.62	0.35	0.68	0.86	0.68	0.08
Control Delay	42.4	19.1	44.8	17.7	21.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	19.1	44.8	17.7	21.6	4.1
LOS	D	B	D	B	C	A
Approach Delay	29.7			22.2	19.1	
Approach LOS	C			C	B	
Queue Length 50th (ft)	91	78	106	354	208	12
Queue Length 95th (ft)	#185	153	#224	572	310	25
Internal Link Dist (ft)	8196			946	1377	
Turn Bay Length (ft)		200	300			100
Base Capacity (vph)	361	703	364	1550	1151	1115
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.33	0.60	0.71	0.47	0.08

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 75.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 22.7 Intersection LOS: C
 Intersection Capacity Utilization 69.5% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑				
Traffic Volume (vph)	0	225	0	0	0	282	0	2328	185	0	0	0
Future Volume (vph)	0	225	0	0	0	282	0	2328	185	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2733	0	4981	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2733	0	4981	0	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		129			8276			1327			639	
Travel Time (s)		2.5			161.2			20.1			9.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	250	0	0	0	313	0	2793	0	0	0	0
Turn Type		NA				Prot		NA				
Protected Phases		4				4		2				
Permitted Phases												
Detector Phase		4				4		2				
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0				
Minimum Split (s)		14.0				14.0		19.0				
Total Split (s)		25.0				25.0		65.0				
Total Split (%)		27.8%				27.8%		72.2%				
Yellow Time (s)		5.0				5.0		5.0				
All-Red Time (s)		2.0				2.0		2.0				
Lost Time Adjust (s)		-2.0				-2.0		-2.0				
Total Lost Time (s)		5.0				5.0		5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		Min				
Act Effct Green (s)		17.1				17.1		53.4				
Actuated g/C Ratio		0.21				0.21		0.66				
v/c Ratio		0.64				0.54		0.85				
Control Delay		38.8				33.4		14.0				
Queue Delay		0.0				0.0		0.0				
Total Delay		38.8				33.4		14.0				
LOS		D				C		B				
Approach Delay		38.8				33.4		14.0				
Approach LOS		D				C		B				
Queue Length 50th (ft)		129				89		374				
Queue Length 95th (ft)		208				134		464				
Internal Link Dist (ft)		49				8196		1247			559	
Turn Bay Length (ft)						200						
Base Capacity (vph)		469				694		3790				
Starvation Cap Reductn		0				0		0				
Spillback Cap Reductn		0				0		0				
Storage Cap Reductn		0				0		0				
Reduced v/c Ratio		0.53				0.45		0.74				

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 80.8

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 17.6 Intersection LOS: B

Intersection Capacity Utilization 121.6% ICU Level of Service H

Analysis Period (min) 15

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙		↑	↘		↕
Traffic Volume (vph)	113	0	0	0	0	2107
Future Volume (vph)	113	0	0	0	0	2107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	3505
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	3505
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		603			1429
Travel Time (s)	1.9		9.1			21.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	0	0	0	0	2341
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	20.0					70.0
Total Split (%)	22.2%					77.8%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					Min
Act Effect Green (s)	12.9					63.8
Actuated g/C Ratio	0.15					0.74
v/c Ratio	0.48					0.91
Control Delay	41.0					16.5
Queue Delay	0.0					0.0
Total Delay	41.0					16.5
LOS	D					B
Approach Delay	41.0					16.5
Approach LOS	D					B
Queue Length 50th (ft)	65					454
Queue Length 95th (ft)	120					#690
Internal Link Dist (ft)	20		523			1349
Turn Bay Length (ft)						
Base Capacity (vph)	304					2650
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.41					0.88

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 86.7
 Natural Cycle: 65
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.91
 Intersection Signal Delay: 17.7 Intersection LOS: B
 Intersection Capacity Utilization 114.0% ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: NC 55 & Jessie Drive North U-Turn



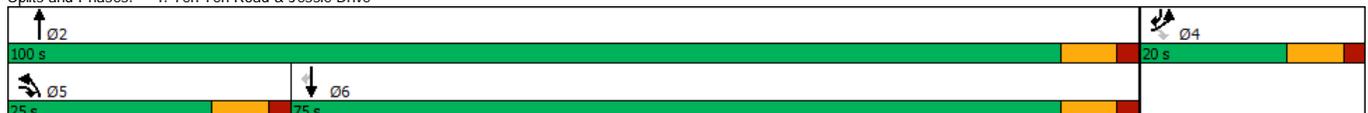


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	195	207	488	984	170
Future Volume (vph)	80	195	207	488	984	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	300			100
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	1845	1845	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	1845	1845	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8276			1026	1457	
Travel Time (s)	161.2			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	217	230	542	1093	189
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	25.0	25.0	100.0	75.0	20.0
Total Split (%)	16.7%	20.8%	20.8%	83.3%	62.5%	16.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effect Green (s)	12.2	35.9	18.7	93.8	70.1	87.2
Actuated g/C Ratio	0.11	0.31	0.16	0.81	0.60	0.75
v/c Ratio	0.49	0.45	0.81	0.36	0.98	0.16
Control Delay	58.7	35.3	69.8	3.9	46.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	35.3	69.8	3.9	46.7	4.6
LOS	E	D	E	A	D	A
Approach Delay	42.2			23.6	40.5	
Approach LOS	D			C	D	
Queue Length 50th (ft)	65	130	168	88	771	36
Queue Length 95th (ft)	119	203	#297	141	#1151	57
Internal Link Dist (ft)	8196			946	1377	
Turn Bay Length (ft)		200	300			100
Base Capacity (vph)	224	497	302	1512	1114	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.44	0.76	0.36	0.98	0.16

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 116
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 35.2
 Intersection LOS: D
 Intersection Capacity Utilization 81.6%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑				
Traffic Volume (vph)	0	169	0	0	0	410	0	1882	112	0	0	0
Future Volume (vph)	0	169	0	0	0	410	0	1882	112	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2733	0	4996	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2733	0	4996	0	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		129			8276			1327			639	
Travel Time (s)		2.5			161.2			20.1			9.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	0	0	0	456	0	2215	0	0	0	0
Turn Type		NA				Prot		NA				
Protected Phases		4				4		2				
Permitted Phases												
Detector Phase		4				4		2				
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0				
Minimum Split (s)		14.0				14.0		19.0				
Total Split (s)		30.0				30.0		60.0				
Total Split (%)		33.3%				33.3%		66.7%				
Yellow Time (s)		5.0				5.0		5.0				
All-Red Time (s)		2.0				2.0		2.0				
Lost Time Adjust (s)		-2.0				-2.0		-2.0				
Total Lost Time (s)		5.0				5.0		5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		Min				
Act Effct Green (s)		19.2				19.2		40.5				
Actuated g/C Ratio		0.27				0.27		0.58				
v/c Ratio		0.37				0.61		0.77				
Control Delay		25.2				27.7		13.5				
Queue Delay		0.0				0.0		0.0				
Total Delay		25.2				27.7		13.5				
LOS		C				C		B				
Approach Delay		25.2				27.7		13.5				
Approach LOS		C				C		B				
Queue Length 50th (ft)		64				94		232				
Queue Length 95th (ft)		146				182		350				
Internal Link Dist (ft)		49				8196		1247			559	
Turn Bay Length (ft)						200						
Base Capacity (vph)		688				1020		3992				
Starvation Cap Reductn		0				0		0				
Spillback Cap Reductn		0				0		0				
Storage Cap Reductn		0				0		0				
Reduced v/c Ratio		0.27				0.45		0.55				

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	70.1
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	16.5
Intersection LOS:	B
Intersection Capacity Utilization:	130.2%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘		↑	↙		↕
Traffic Volume (vph)	185	0	0	0	0	2497
Future Volume (vph)	185	0	0	0	0	2497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	3505
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	3505
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		603			1429
Travel Time (s)	1.9		9.1			21.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	206	0	0	0	0	2774
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	23.0					97.0
Total Split (%)	19.2%					80.8%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					Min
Act Effect Green (s)	17.4					92.6
Actuated g/C Ratio	0.14					0.77
v/c Ratio	0.81					1.03
Control Delay	74.0					39.4
Queue Delay	0.0					0.0
Total Delay	74.0					39.4
LOS	E					D
Approach Delay	74.0					39.4
Approach LOS	E					D
Queue Length 50th (ft)	156					~1213
Queue Length 95th (ft)	#275					#1340
Internal Link Dist (ft)	20		523			1349
Turn Bay Length (ft)						
Base Capacity (vph)	262					2703
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.79					1.03

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 120
 Natural Cycle: 100
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.03
 Intersection Signal Delay: 41.8 Intersection LOS: D
 Intersection Capacity Utilization 117.2% ICU Level of Service H
 Analysis Period (min) 15
 - Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: NC 55 & Jessie Drive North U-Turn



2022 Build – 3 Southbound NC 55 Lanes

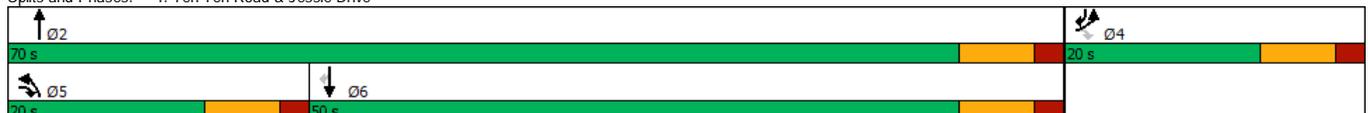


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	170	207	195	984	488	80
Future Volume (vph)	170	207	195	984	488	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	300			100
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	1845	1845	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	1845	1845	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8276			1026	1457	
Travel Time (s)	161.2			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	189	230	217	1093	542	89
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	20.0	20.0	70.0	50.0	20.0
Total Split (%)	22.2%	22.2%	22.2%	77.8%	55.6%	22.2%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effect Green (s)	13.3	32.4	13.9	52.1	32.9	51.5
Actuated g/C Ratio	0.18	0.43	0.18	0.69	0.43	0.68
v/c Ratio	0.62	0.35	0.68	0.86	0.68	0.08
Control Delay	42.4	19.1	44.8	17.7	21.6	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.4	19.1	44.8	17.7	21.6	4.1
LOS	D	B	D	B	C	A
Approach Delay	29.7			22.2	19.1	
Approach LOS	C			C	B	
Queue Length 50th (ft)	91	78	106	354	208	12
Queue Length 95th (ft)	#185	153	#224	572	310	25
Internal Link Dist (ft)	8196			946	1377	
Turn Bay Length (ft)		200	300			100
Base Capacity (vph)	361	703	364	1550	1151	1115
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.33	0.60	0.71	0.47	0.08

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 75.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.86
 Intersection Signal Delay: 22.7 Intersection LOS: C
 Intersection Capacity Utilization 69.5% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑				
Traffic Volume (vph)	0	225	0	0	0	282	0	2328	185	0	0	0
Future Volume (vph)	0	225	0	0	0	282	0	2328	185	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2733	0	4981	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2733	0	4981	0	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		129			8276			1327			639	
Travel Time (s)		2.5			161.2			20.1			9.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	250	0	0	0	313	0	2793	0	0	0	0
Turn Type		NA				Prot		NA				
Protected Phases		4				4		2				
Permitted Phases												
Detector Phase		4				4		2				
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0				
Minimum Split (s)		14.0				14.0		19.0				
Total Split (s)		25.0				25.0		65.0				
Total Split (%)		27.8%				27.8%		72.2%				
Yellow Time (s)		5.0				5.0		5.0				
All-Red Time (s)		2.0				2.0		2.0				
Lost Time Adjust (s)		-2.0				-2.0		-2.0				
Total Lost Time (s)		5.0				5.0		5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		Min				
Act Effct Green (s)		17.1				17.1		53.4				
Actuated g/C Ratio		0.21				0.21		0.66				
v/c Ratio		0.64				0.54		0.85				
Control Delay		38.8				33.4		14.0				
Queue Delay		0.0				0.0		0.0				
Total Delay		38.8				33.4		14.0				
LOS		D				C		B				
Approach Delay		38.8			33.4			14.0				
Approach LOS		D			C			B				
Queue Length 50th (ft)		129				89		374				
Queue Length 95th (ft)		208				134		464				
Internal Link Dist (ft)		49			8196			1247		559		
Turn Bay Length (ft)						200						
Base Capacity (vph)		469				694		3790				
Starvation Cap Reductn		0				0		0				
Spillback Cap Reductn		0				0		0				
Storage Cap Reductn		0				0		0				
Reduced v/c Ratio		0.53				0.45		0.74				

Intersection Summary
 Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 80.8
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 17.6 Intersection LOS: B
 Intersection Capacity Utilization 105.0% ICU Level of Service G
 Analysis Period (min) 15

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	113	0	0	0	0	2107
Future Volume (vph)	113	0	0	0	0	2107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		603			1429
Travel Time (s)	1.9		9.1			21.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	126	0	0	0	0	2341
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	20.0					70.0
Total Split (%)	22.2%					77.8%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					Min
Act Effect Green (s)	11.9					44.2
Actuated g/C Ratio	0.19					0.72
v/c Ratio	0.37					0.64
Control Delay	27.5					7.5
Queue Delay	0.0					0.0
Total Delay	27.5					7.5
LOS	C					A
Approach Delay	27.5					7.5
Approach LOS	C					A
Queue Length 50th (ft)	38					172
Queue Length 95th (ft)	101					260
Internal Link Dist (ft)	20		523			1349
Turn Bay Length (ft)						
Base Capacity (vph)	443					4857
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.28					0.48

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	61.2
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.64
Intersection Signal Delay:	8.5
Intersection Capacity Utilization:	96.5%
Analysis Period (min):	15
Intersection LOS:	A
ICU Level of Service:	F

Splits and Phases: 3: NC 55 & Jessie Drive North U-Turn



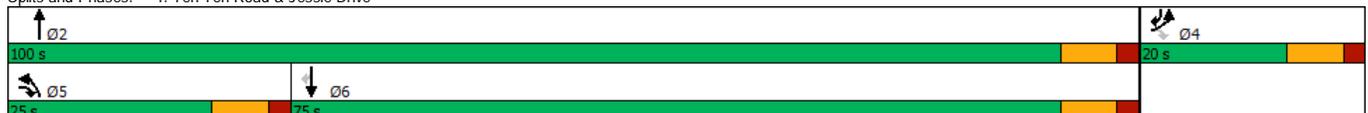


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	80	195	207	488	984	170
Future Volume (vph)	80	195	207	488	984	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	200	300			100
Storage Lanes	1	1	1			1
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	1845	1845	1568
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	1845	1845	1568
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8276			1026	1457	
Travel Time (s)	161.2			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	89	217	230	542	1093	189
Turn Type	Prot	pm+ov	Prot	NA	NA	pm+ov
Protected Phases	4	5	5	2	6	4
Permitted Phases		4				6
Detector Phase	4	5	5	2	6	4
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	7.0
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	14.0
Total Split (s)	20.0	25.0	25.0	100.0	75.0	20.0
Total Split (%)	16.7%	20.8%	20.8%	83.3%	62.5%	16.7%
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	-2.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	None
Act Effect Green (s)	12.2	35.9	18.7	93.8	70.1	87.2
Actuated g/C Ratio	0.11	0.31	0.16	0.81	0.60	0.75
v/c Ratio	0.49	0.45	0.81	0.36	0.98	0.16
Control Delay	58.7	35.3	69.8	3.9	46.7	4.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.7	35.3	69.8	3.9	46.7	4.6
LOS	E	D	E	A	D	A
Approach Delay	42.2			23.6	40.5	
Approach LOS	D			C	D	
Queue Length 50th (ft)	65	130	168	88	771	36
Queue Length 95th (ft)	119	203	#297	141	#1151	57
Internal Link Dist (ft)	8196			946	1377	
Turn Bay Length (ft)		200	300			100
Base Capacity (vph)	224	497	302	1512	1114	1217
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.44	0.76	0.36	0.98	0.16

Intersection Summary

Area Type: Other
 Cycle Length: 120
 Actuated Cycle Length: 116
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.98
 Intersection Signal Delay: 35.2
 Intersection LOS: D
 Intersection Capacity Utilization 81.6%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑				
Traffic Volume (vph)	0	169	0	0	0	410	0	1882	112	0	0	0
Future Volume (vph)	0	169	0	0	0	410	0	1882	112	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		200	0		0	0		0
Storage Lanes	0		0	0		1	0		0	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2733	0	4996	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2733	0	4996	0	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		129			8276			1327			639	
Travel Time (s)		2.5			161.2			20.1			9.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	4%	4%	4%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	188	0	0	0	456	0	2215	0	0	0	0
Turn Type		NA				Prot		NA				
Protected Phases		4				4		2				
Permitted Phases												
Detector Phase		4				4		2				
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0				
Minimum Split (s)		14.0				14.0		19.0				
Total Split (s)		30.0				30.0		60.0				
Total Split (%)		33.3%				33.3%		66.7%				
Yellow Time (s)		5.0				5.0		5.0				
All-Red Time (s)		2.0				2.0		2.0				
Lost Time Adjust (s)		-2.0				-2.0		-2.0				
Total Lost Time (s)		5.0				5.0		5.0				
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		Min				
Act Effct Green (s)		19.2				19.2		40.5				
Actuated g/C Ratio		0.27				0.27		0.58				
v/c Ratio		0.37				0.61		0.77				
Control Delay		25.2				27.7		13.5				
Queue Delay		0.0				0.0		0.0				
Total Delay		25.2				27.7		13.5				
LOS		C				C		B				
Approach Delay		25.2				27.7		13.5				
Approach LOS		C				C		B				
Queue Length 50th (ft)		64				94		232				
Queue Length 95th (ft)		146				182		350				
Internal Link Dist (ft)		49				8196		1247			559	
Turn Bay Length (ft)						200						
Base Capacity (vph)		688				1020		3992				
Starvation Cap Reductn		0				0		0				
Spillback Cap Reductn		0				0		0				
Storage Cap Reductn		0				0		0				
Reduced v/c Ratio		0.27				0.45		0.55				

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	70.1
Natural Cycle:	45
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.77
Intersection Signal Delay:	16.5
Intersection LOS:	B
Intersection Capacity Utilization:	109.3%
ICU Level of Service:	H
Analysis Period (min):	15

Splits and Phases: 2: NC 55 & Jessie Drive

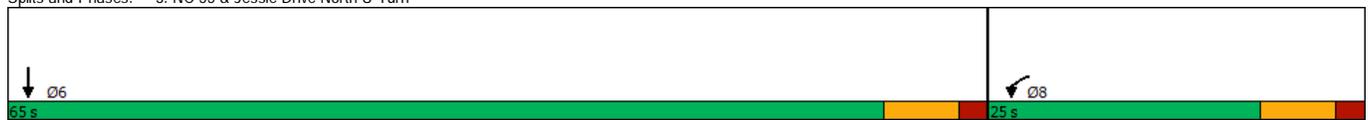




Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	185	0	0	0	0	2497
Future Volume (vph)	185	0	0	0	0	2497
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	1752	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	1752	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		603			1429
Travel Time (s)	1.9		9.1			21.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	206	0	0	0	0	2774
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	25.0					65.0
Total Split (%)	27.8%					72.2%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					Min
Act Effect Green (s)	16.3					53.2
Actuated g/C Ratio	0.20					0.67
v/c Ratio	0.58					0.83
Control Delay	36.8					12.8
Queue Delay	0.0					0.0
Total Delay	36.8					12.8
LOS	D					B
Approach Delay	36.8					12.8
Approach LOS	D					B
Queue Length 50th (ft)	98					334
Queue Length 95th (ft)	174					449
Internal Link Dist (ft)	20		523			1349
Turn Bay Length (ft)						
Base Capacity (vph)	448					3866
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.46					0.72

Intersection Summary	
Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	79.7
Natural Cycle:	60
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.83
Intersection Signal Delay:	14.5
Intersection Capacity Utilization:	96.5%
Analysis Period (min):	15
Intersection LOS:	B
ICU Level of Service:	F

Splits and Phases: 3: NC 55 & Jessie Drive North U-Turn



2035 Build

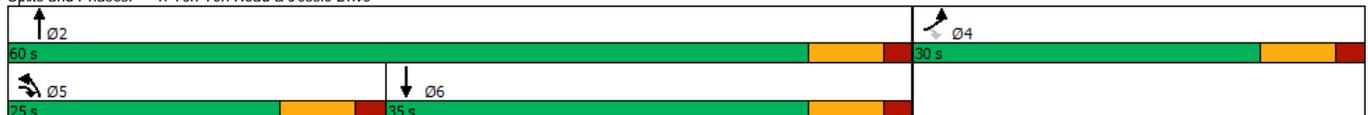


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	265	213	207	1510	769	131
Future Volume (vph)	265	213	207	1510	769	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	3505	4925	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	3505	4925	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8210			1026	1457	
Travel Time (s)	159.9			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	294	237	230	1678	1000	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	30.0	25.0	25.0	60.0	35.0	
Total Split (%)	33.3%	27.8%	27.8%	66.7%	38.9%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effect Green (s)	19.6	41.0	16.3	50.5	29.0	
Actuated g/C Ratio	0.24	0.51	0.20	0.63	0.36	
v/c Ratio	0.70	0.30	0.65	0.76	0.56	
Control Delay	38.1	12.5	40.0	14.1	23.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	38.1	12.5	40.0	14.1	23.0	
LOS	D	B	D	B	C	
Approach Delay	26.7			17.2	23.0	
Approach LOS	C			B	C	
Queue Length 50th (ft)	145	71	114	290	150	
Queue Length 95th (ft)	231	110	194	437	217	
Internal Link Dist (ft)	8130			946	1377	
Turn Bay Length (ft)		250	300			
Base Capacity (vph)	554	874	447	2463	1934	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.53	0.27	0.51	0.68	0.52	

Intersection Summary

Area Type:	Other
Cycle Length:	90
Actuated Cycle Length:	80.3
Natural Cycle:	50
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.76
Intersection Signal Delay:	20.3
Intersection LOS:	C
Intersection Capacity Utilization:	64.8%
ICU Level of Service:	C
Analysis Period (min):	15

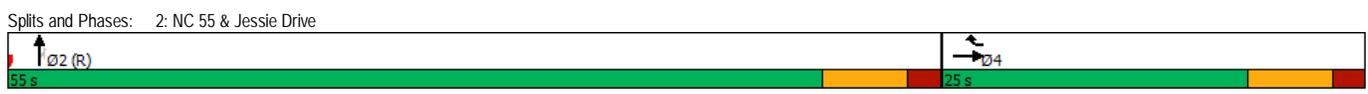
Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	279	0	0	0	481	0	2652	437	0	0	0
Future Volume (vph)	0	279	0	0	0	481	0	2652	437	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		300	0		0	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		177			8210			213			626	
Travel Time (s)		3.4			159.9			3.2			9.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	310	0	0	0	534	0	2947	486	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		25.0				25.0		55.0	55.0			
Total Split (%)		31.3%				31.3%		68.8%	68.8%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effct Green (s)		19.5				19.5		50.5	50.5			
Actuated g/C Ratio		0.24				0.24		0.63	0.63			
v/c Ratio		0.69				0.81		0.93	0.49			
Control Delay		32.2				39.6		12.3	7.0			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		32.2				39.6		12.3	7.0			
LOS		C				D		B	A			
Approach Delay		32.2				39.6		11.5				
Approach LOS		C				D		B				
Queue Length 50th (ft)		158				141		176	72			
Queue Length 95th (ft)		m230				#223		#429	m111			
Internal Link Dist (ft)		97				8130		133			546	
Turn Bay Length (ft)						300						
Base Capacity (vph)		461				676		3178	990			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.67				0.79		0.93	0.49			

Intersection Summary
 Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.93
 Intersection Signal Delay: 16.5
 Intersection LOS: B
 Intersection Capacity Utilization 119.5%
 ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↑	↔↔		↑↑↑
Traffic Volume (vph)	258	0	0	0	0	2374
Future Volume (vph)	258	0	0	0	0	2374
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		555			1234
Travel Time (s)	1.9		8.4			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	287	0	0	0	0	2638
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	20.0					60.0
Total Split (%)	25.0%					75.0%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	13.5					56.5
Actuated g/C Ratio	0.17					0.71
v/c Ratio	0.50					0.74
Control Delay	32.4					9.1
Queue Delay	0.0					0.0
Total Delay	32.4					9.1
LOS	C					A
Approach Delay	32.4					9.1
Approach LOS	C					A
Queue Length 50th (ft)	36					253
Queue Length 95th (ft)	m52					327
Internal Link Dist (ft)	20		475			1154
Turn Bay Length (ft)						
Base Capacity (vph)	637					3559
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.45					0.74

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 1 (1%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.74
 Intersection Signal Delay: 11.4 Intersection LOS: B
 Intersection Capacity Utilization 108.9% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn



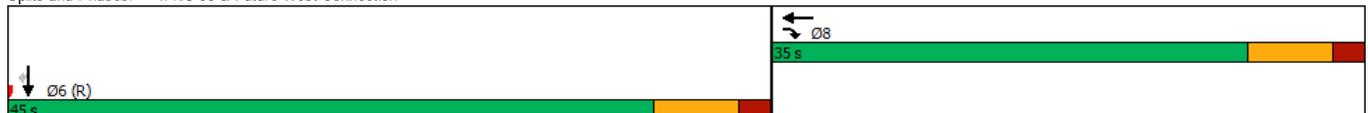


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑		↑						↑↑↑	↑
Traffic Volume (vph)	0	0	592	0	147	0	0	0	0	0	2109	244
Future Volume (vph)	0	0	592	0	147	0	0	0	0	0	2109	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	658	0	163	0	0	0	0	0	2343	271
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			35.0		35.0						45.0	45.0
Total Split (%)			43.8%		43.8%						56.3%	56.3%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			26.2		26.2						43.8	43.8
Actuated g/C Ratio			0.33		0.33						0.55	0.55
v/c Ratio			0.73		0.27						0.85	0.32
Control Delay			28.5		21.3						14.2	8.9
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			28.5		21.3						14.2	8.9
LOS			C		C						B	A
Approach Delay		28.5			21.3						13.7	
Approach LOS		C			C						B	
Queue Length 50th (ft)			160		76						160	46
Queue Length 95th (ft)			212		m77						#401	m76
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			1035		691						2754	857
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.64		0.24						0.85	0.32

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 7 (9%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.85
 Intersection Signal Delay: 16.9
 Intersection LOS: B
 Intersection Capacity Utilization 127.1%
 ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔			↑↑↑		
Traffic Volume (vph)	412	0	0	2824	0	0
Future Volume (vph)	412	0	0	2824	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	458	0	0	3138	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	20.0			60.0		
Total Split (%)	25.0%			75.0%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effect Green (s)	14.7			55.3		
Actuated g/C Ratio	0.18			0.69		
v/c Ratio	0.73			0.90		
Control Delay	37.8			15.2		
Queue Delay	0.0			0.0		
Total Delay	37.8			15.2		
LOS	D			B		
Approach Delay	37.8			15.2		
Approach LOS	D			B		
Queue Length 50th (ft)	62			403		
Queue Length 95th (ft)	103			497		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	637			3478		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.72			0.90		

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 78 (98%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.90
 Intersection Signal Delay: 18.1 Intersection LOS: B
 Intersection Capacity Utilization 74.7% ICU Level of Service D
 Analysis Period (min) 15

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



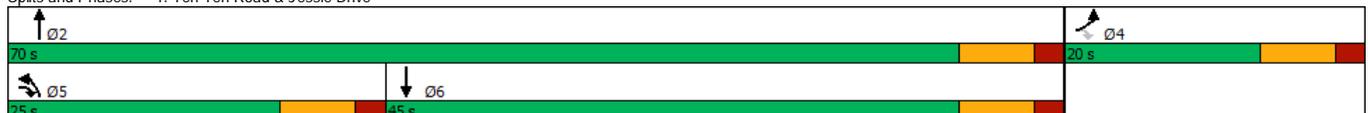


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	131	207	213	769	1510	265
Future Volume (vph)	131	207	213	769	1510	265
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	250	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	3505	4925	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	3505	4925	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8210			1026	1457	
Travel Time (s)	159.9			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	146	230	237	854	1972	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	20.0	25.0	25.0	70.0	45.0	
Total Split (%)	22.2%	27.8%	27.8%	77.8%	50.0%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effct Green (s)	12.7	34.3	16.6	61.9	40.2	
Actuated g/C Ratio	0.15	0.41	0.20	0.73	0.48	
v/c Ratio	0.56	0.37	0.69	0.33	0.84	
Control Delay	42.9	19.0	43.0	4.6	24.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.9	19.0	43.0	4.6	24.8	
LOS	D	B	D	A	C	
Approach Delay	28.3			12.9	24.8	
Approach LOS	C			B	C	
Queue Length 50th (ft)	74	83	119	72	338	
Queue Length 95th (ft)	137	138	200	103	#443	
Internal Link Dist (ft)	8130			946	1377	
Turn Bay Length (ft)		250	300			
Base Capacity (vph)	309	694	416	2707	2340	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.47	0.33	0.57	0.32	0.84	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 84.6
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.84
 Intersection Signal Delay: 21.4 Intersection LOS: C
 Intersection Capacity Utilization 66.6% ICU Level of Service C
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive



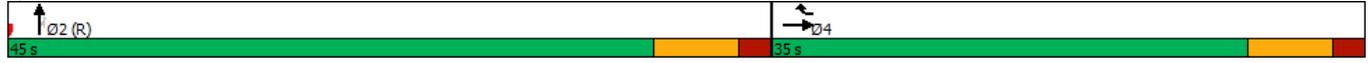


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	223	0	0	0	716	0	2095	258	0	0	0
Future Volume (vph)	0	223	0	0	0	716	0	2095	258	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		300	0		0	0		0
Storage Lanes	0		0	0		1	0		1	0		0
Taper Length (ft)	25			25			25			25		
Satd. Flow (prot)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		177			8210			213			626	
Travel Time (s)		3.4			159.9			3.2			9.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	248	0	0	0	796	0	2328	287	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		35.0				35.0		45.0	45.0			
Total Split (%)		43.8%				43.8%		56.3%	56.3%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effct Green (s)		28.6				28.6		41.4	41.4			
Actuated g/C Ratio		0.36				0.36		0.52	0.52			
v/c Ratio		0.38				0.82		0.89	0.35			
Control Delay		14.6				31.6		17.2	9.9			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		14.6				31.6		17.2	9.9			
LOS		B				C		B	A			
Approach Delay		14.6			31.6			16.4				
Approach LOS		B			C			B				
Queue Length 50th (ft)		94				196		266	55			
Queue Length 95th (ft)		m94				273		#356	m82			
Internal Link Dist (ft)		97			8130			133		546		
Turn Bay Length (ft)						300						
Base Capacity (vph)		691				1015		2607	812			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.36				0.78		0.89	0.35			

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.89
 Intersection Signal Delay: 19.6
 Intersection LOS: B
 Intersection Capacity Utilization 131.2%
 ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↑		↔↔↔	
Traffic Volume (vph)	437	0	0	0	0	2875
Future Volume (vph)	437	0	0	0	0	2875
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	0	0	5036
Right Turn on Red	No	No	No			
Satd. Flow (RTOR)						
Link Speed (mph)	35		45		45	
Link Distance (ft)	100		555		1234	
Travel Time (s)	1.9		8.4		18.7	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	486	0	0	0	0	3194
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	20.0					60.0
Total Split (%)	25.0%					75.0%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	14.9					55.1
Actuated g/C Ratio	0.19					0.69
v/c Ratio	0.77					0.92
Control Delay	23.1					16.6
Queue Delay	0.0					0.0
Total Delay	23.1					16.6
LOS	C					B
Approach Delay	23.1					16.6
Approach LOS	C					B
Queue Length 50th (ft)	28					423
Queue Length 95th (ft)	m96					523
Internal Link Dist (ft)	20		475		1154	
Turn Bay Length (ft)						
Base Capacity (vph)	637					3470
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.76					0.92

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 17.5 Intersection LOS: B
 Intersection Capacity Utilization 108.9% ICU Level of Service G
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↗		↑						↑↑↑	↖
Traffic Volume (vph)	0	0	391	0	180	0	0	0	0	0	2677	412
Future Volume (vph)	0	0	391	0	180	0	0	0	0	0	2677	412
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	434	0	200	0	0	0	0	0	2974	458
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			25.0		25.0						55.0	55.0
Total Split (%)			31.3%		31.3%						68.8%	68.8%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			18.4		18.4						51.6	51.6
Actuated g/C Ratio			0.23		0.23						0.64	0.64
v/c Ratio			0.69		0.47						0.92	0.45
Control Delay			34.1		40.3						11.0	5.8
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			34.1		40.3						11.0	5.8
LOS			C		D						B	A
Approach Delay		34.1			40.3						10.3	
Approach LOS		C			D						B	
Queue Length 50th (ft)			110		111						183	61
Queue Length 95th (ft)			162		m155						#484	m82
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			690		461						3250	1012
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.63		0.43						0.92	0.45

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 7 (9%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 14.3 Intersection LOS: B
 Intersection Capacity Utilization 116.9% ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔			↑↑↑		
Traffic Volume (vph)	244	0	0	2289	0	0
Future Volume (vph)	244	0	0	2289	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	271	0	0	2543	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	20.0			60.0		
Total Split (%)	25.0%			75.0%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effct Green (s)	13.2			56.8		
Actuated g/C Ratio	0.16			0.71		
v/c Ratio	0.48			0.71		
Control Delay	60.4			8.5		
Queue Delay	0.0			0.0		
Total Delay	60.4			8.5		
LOS	E			A		
Approach Delay	60.4			8.5		
Approach LOS	E			A		
Queue Length 50th (ft)	75			230		
Queue Length 95th (ft)	110			303		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	637			3573		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.43			0.71		

Intersection Summary

Area Type: Other
 Cycle Length: 80
 Actuated Cycle Length: 80
 Offset: 75 (94%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 50
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.71
 Intersection Signal Delay: 13.5 Intersection LOS: B
 Intersection Capacity Utilization 62.1% ICU Level of Service B
 Analysis Period (min) 15

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



2045 Build

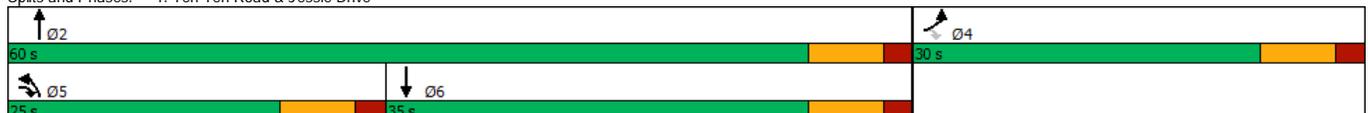


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	341	243	239	1815	926	172
Future Volume (vph)	341	243	239	1815	926	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	3505	4920	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	3505	4920	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8210			1026	1457	
Travel Time (s)	159.9			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	379	270	266	2017	1220	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	30.0	25.0	25.0	60.0	35.0	
Total Split (%)	33.3%	27.8%	27.8%	66.7%	38.9%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effct Green (s)	22.9	45.8	17.8	55.1	32.2	
Actuated g/C Ratio	0.26	0.52	0.20	0.63	0.37	
v/c Ratio	0.84	0.33	0.75	0.92	0.68	
Control Delay	48.4	13.0	47.0	23.8	26.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	48.4	13.0	47.0	23.8	26.8	
LOS	D	B	D	C	C	
Approach Delay	33.7			26.5	26.8	
Approach LOS	C			C	C	
Queue Length 50th (ft)	199	77	140	504	222	
Queue Length 95th (ft)	#338	126	#227	#732	275	
Internal Link Dist (ft)	8130			946	1377	
Turn Bay Length (ft)			300			
Base Capacity (vph)	493	846	398	2192	1801	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.77	0.32	0.67	0.92	0.68	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 88
 Natural Cycle: 75
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.92
 Intersection Signal Delay: 27.7
 Intersection LOS: C
 Intersection Capacity Utilization 77.4%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	358	0	0	0	634	0	2814	581	0	0	0
Future Volume (vph)	0	358	0	0	0	634	0	2814	581	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		177			8210			213			626	
Travel Time (s)		3.4			159.9			3.2			9.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	398	0	0	0	704	0	3127	646	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		30.0				30.0		60.0	60.0			
Total Split (%)		33.3%				33.3%		66.7%	66.7%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effect Green (s)		25.0				25.0		55.0	55.0			
Actuated g/C Ratio		0.28				0.28		0.61	0.61			
v/c Ratio		0.78				0.94		1.02	0.67			
Control Delay		36.9				53.7		28.2	10.8			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		36.9				53.7		28.2	10.8			
LOS		D				D		C	B			
Approach Delay		36.9				53.7		25.2				
Approach LOS		D				D		C				
Queue Length 50th (ft)		244				221		-542	146			
Queue Length 95th (ft)		m307				#343		m#753	m164			
Internal Link Dist (ft)		97				8130		133			546	
Turn Bay Length (ft)												
Base Capacity (vph)		512				751		3077	958			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.78				0.94		1.02	0.67			

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 89 (99%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 30.3
 Intersection LOS: C
 Intersection Capacity Utilization 132.0%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↑	↔↔		↑↑↑
Traffic Volume (vph)	345	0	0	0	0	2572
Future Volume (vph)	345	0	0	0	0	2572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		555			1234
Travel Time (s)	1.9		8.4			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	383	0	0	0	0	2858
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	25.0					65.0
Total Split (%)	27.8%					72.2%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	17.0					63.0
Actuated g/C Ratio	0.19					0.70
v/c Ratio	0.60					0.81
Control Delay	28.0					12.3
Queue Delay	0.0					0.0
Total Delay	28.0					12.3
LOS	C					B
Approach Delay	28.0					12.3
Approach LOS	C					B
Queue Length 50th (ft)	49					358
Queue Length 95th (ft)	m43					482
Internal Link Dist (ft)	20		475			1154
Turn Bay Length (ft)						
Base Capacity (vph)	755					3525
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.51					0.81

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 2 (2%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 60
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.81
 Intersection Signal Delay: 14.1 Intersection LOS: B
 Intersection Capacity Utilization 117.1% ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn



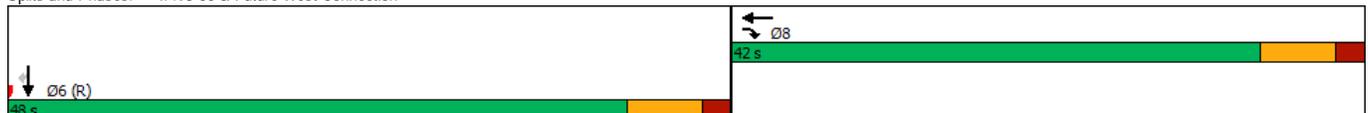


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗↘		↕						↕↕↕	↗↘
Traffic Volume (vph)	0	0	729	0	173	0	0	0	0	0	2253	306
Future Volume (vph)	0	0	729	0	173	0	0	0	0	0	2253	306
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	810	0	192	0	0	0	0	0	2503	340
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			42.0		42.0						48.0	48.0
Total Split (%)			46.7%		46.7%						53.3%	53.3%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			33.5		33.5						46.5	46.5
Actuated g/C Ratio			0.37		0.37						0.52	0.52
v/c Ratio			0.79		0.28						0.96	0.42
Control Delay			31.0		15.9						26.9	15.0
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			31.0		15.9						26.9	15.0
LOS			C		B						C	B
Approach Delay		31.0			15.9						25.5	
Approach LOS		C			B						C	
Queue Length 50th (ft)			222		78						321	89
Queue Length 95th (ft)			288		m77						#659	m150
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			1134		758						2600	809
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.71		0.25						0.96	0.42

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 65
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 26.2
 Intersection LOS: C
 Intersection Capacity Utilization 140.6%
 ICU Level of Service H
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔			↑↑↑		
Traffic Volume (vph)	518	0	0	3050	0	0
Future Volume (vph)	518	0	0	3050	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	576	0	0	3389	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	22.0			68.0		
Total Split (%)	24.4%			75.6%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effect Green (s)	17.0			63.0		
Actuated g/C Ratio	0.19			0.70		
v/c Ratio	0.90			0.96		
Control Delay	31.2			21.8		
Queue Delay	0.0			0.0		
Total Delay	31.2			21.8		
LOS	C			C		
Approach Delay	31.2			21.8		
Approach LOS	C			C		
Queue Length 50th (ft)	52			555		
Queue Length 95th (ft)	#211			#722		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	642			3525		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.90			0.96		

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 87 (97%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 23.1 Intersection LOS: C
 Intersection Capacity Utilization 82.0% ICU Level of Service E
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



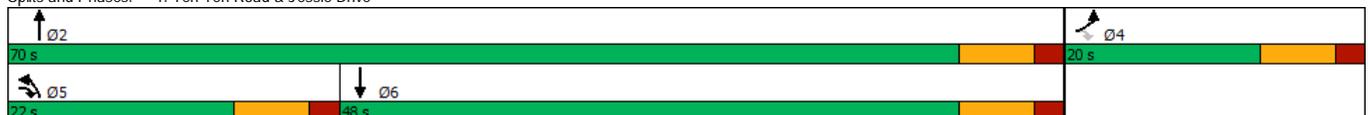


Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	172	239	243	926	1815	341
Future Volume (vph)	172	239	243	926	1815	341
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0	0	400			0
Storage Lanes	1	1	1			0
Taper Length (ft)	100		100			
Satd. Flow (prot)	1736	1553	1752	3505	4915	0
Flt Permitted	0.950		0.950			
Satd. Flow (perm)	1736	1553	1752	3505	4915	0
Right Turn on Red		No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	8210			1026	1457	
Travel Time (s)	159.9			15.5	22.1	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	4%	4%	3%	3%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	191	266	270	1029	2396	0
Turn Type	Prot	pm+ov	Prot	NA	NA	
Protected Phases	4	5	5	2	6	
Permitted Phases		4				
Detector Phase	4	5	5	2	6	
Switch Phase						
Minimum Initial (s)	7.0	7.0	7.0	12.0	12.0	
Minimum Split (s)	14.0	14.0	14.0	19.0	19.0	
Total Split (s)	20.0	22.0	22.0	70.0	48.0	
Total Split (%)	22.2%	24.4%	24.4%	77.8%	53.3%	
Yellow Time (s)	5.0	5.0	5.0	5.0	5.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	
Lead/Lag		Lead	Lead		Lag	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	Min	Min	
Act Effect Green (s)	13.8	35.1	16.4	64.4	43.0	
Actuated g/C Ratio	0.16	0.40	0.19	0.73	0.49	
v/c Ratio	0.70	0.43	0.83	0.40	1.00	
Control Delay	50.5	21.7	57.8	5.2	42.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	50.5	21.7	57.8	5.2	42.1	
LOS	D	C	E	A	D	
Approach Delay	33.8			16.2	42.1	
Approach LOS	C			B	D	
Queue Length 50th (ft)	103	105	148	101	~507	
Queue Length 95th (ft)	#188	171	#277	131	#630	
Internal Link Dist (ft)	8130			946	1377	
Turn Bay Length (ft)			300			
Base Capacity (vph)	295	630	337	2585	2398	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.65	0.42	0.80	0.40	1.00	

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 88.2
 Natural Cycle: 90
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 33.1 Intersection LOS: C
 Intersection Capacity Utilization 78.2% ICU Level of Service D
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Ten Ten Road & Jessie Drive





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑				↑↑		↑↑↑	↑			
Traffic Volume (vph)	0	289	0	0	0	939	0	2214	345	0	0	0
Future Volume (vph)	0	289	0	0	0	939	0	2214	345	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1845	0	0	0	2707	0	5036	1568	0	0	0
Right Turn on Red	No		No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		177			8210			213			626	
Travel Time (s)		3.4			159.9			3.2			9.5	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	5%	5%	5%	3%	3%	3%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	321	0	0	0	1043	0	2460	383	0	0	0
Turn Type		NA				Prot		NA	Perm			
Protected Phases		4				4		2				
Permitted Phases									2			
Detector Phase		4				4		2	2			
Switch Phase												
Minimum Initial (s)		7.0				7.0		12.0	12.0			
Minimum Split (s)		14.0				14.0		19.0	19.0			
Total Split (s)		41.0				41.0		49.0	49.0			
Total Split (%)		45.6%				45.6%		54.4%	54.4%			
Yellow Time (s)		5.0				5.0		5.0	5.0			
All-Red Time (s)		2.0				2.0		2.0	2.0			
Lost Time Adjust (s)		-2.0				-2.0		-2.0	-2.0			
Total Lost Time (s)		5.0				5.0		5.0	5.0			
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode		None				None		C-Max	C-Max			
Act Effect Green (s)		36.0				36.0		44.0	44.0			
Actuated g/C Ratio		0.40				0.40		0.49	0.49			
v/c Ratio		0.43				0.96		1.00	0.50			
Control Delay		21.9				47.6		33.6	13.5			
Queue Delay		0.0				0.0		0.0	0.0			
Total Delay		21.9				47.6		33.6	13.5			
LOS		C				D		C	B			
Approach Delay		21.9				47.6		30.9				
Approach LOS		C				D		C				
Queue Length 50th (ft)		130				321		-475	91			
Queue Length 95th (ft)		202				#475		#626	m133			
Internal Link Dist (ft)		97				8130		133			546	
Turn Bay Length (ft)												
Base Capacity (vph)		738				1082		2462	766			
Starvation Cap Reductn		0				0		0	0			
Spillback Cap Reductn		0				0		0	0			
Storage Cap Reductn		0				0		0	0			
Reduced v/c Ratio		0.43				0.96		1.00	0.50			

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 34.4 Intersection LOS: C
 Intersection Capacity Utilization 147.2% ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: NC 55 & Jessie Drive





Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↙↘		↑	↘	↙	↑↑↑
Traffic Volume (vph)	581	0	0	0	0	3103
Future Volume (vph)	581	0	0	0	0	3103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	0	0	5036
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	0	0	5036
Right Turn on Red	No	No		No		
Satd. Flow (RTOR)						
Link Speed (mph)	35		45			45
Link Distance (ft)	100		555			1234
Travel Time (s)	1.9		8.4			18.7
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	2%	2%	3%	3%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	646	0	0	0	0	3448
Turn Type	Prot					NA
Protected Phases	8					6
Permitted Phases						
Detector Phase	8					6
Switch Phase						
Minimum Initial (s)	7.0					12.0
Minimum Split (s)	14.0					19.0
Total Split (s)	27.0					73.0
Total Split (%)	27.0%					73.0%
Yellow Time (s)	5.0					5.0
All-Red Time (s)	2.0					2.0
Lost Time Adjust (s)	-2.0					-2.0
Total Lost Time (s)	5.0					5.0
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None					C-Max
Act Effect Green (s)	21.8					68.2
Actuated g/C Ratio	0.22					0.68
v/c Ratio	0.87					1.00
Control Delay	51.7					33.1
Queue Delay	0.0					0.0
Total Delay	51.7					33.1
LOS	D					C
Approach Delay	51.7					33.1
Approach LOS	D					C
Queue Length 50th (ft)	205					~741
Queue Length 95th (ft)	#297					#934
Internal Link Dist (ft)	20		475			1154
Turn Bay Length (ft)						
Base Capacity (vph)	748					3434
Starvation Cap Reductn	0					0
Spillback Cap Reductn	0					0
Storage Cap Reductn	0					0
Reduced v/c Ratio	0.86					1.00

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 1.00
 Intersection Signal Delay: 36.0
 Intersection LOS: D
 Intersection Capacity Utilization 117.1%
 ICU Level of Service H
 Analysis Period (min) 15
 ~ Volume exceeds capacity, queue is theoretically infinite.
 Queue shown is maximum after two cycles.
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: NC 55 & Jessie Dr North U-Turn





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↑↑		↑						↑↑↑	↑
Traffic Volume (vph)	0	0	479	0	211	0	0	0	0	0	2877	518
Future Volume (vph)	0	0	479	0	211	0	0	0	0	0	2877	518
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Flt Permitted												
Satd. Flow (perm)	0	0	2760	0	1845	0	0	0	0	0	5036	1568
Right Turn on Red			No	No		No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		35			35			45			45	
Link Distance (ft)		819			172			545			197	
Travel Time (s)		16.0			3.4			8.3			3.0	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	0	532	0	234	0	0	0	0	0	3197	576
Turn Type			Prot		NA						NA	Perm
Protected Phases			8		8						6	
Permitted Phases												6
Detector Phase			8		8						6	6
Switch Phase												
Minimum Initial (s)			7.0		7.0						12.0	12.0
Minimum Split (s)			14.0		14.0						19.0	19.0
Total Split (s)			30.0		30.0						70.0	70.0
Total Split (%)			30.0%		30.0%						70.0%	70.0%
Yellow Time (s)			5.0		5.0						5.0	5.0
All-Red Time (s)			2.0		2.0						2.0	2.0
Lost Time Adjust (s)			-2.0		-2.0						-2.0	-2.0
Total Lost Time (s)			5.0		5.0						5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode			None		None						C-Max	C-Max
Act Effect Green (s)			23.8		23.8						66.2	66.2
Actuated g/C Ratio			0.24		0.24						0.66	0.66
v/c Ratio			0.81		0.53						0.96	0.55
Control Delay			46.6		38.0						15.3	8.2
Queue Delay			0.0		0.0						0.0	0.0
Total Delay			46.6		38.0						15.3	8.2
LOS			D		D						B	A
Approach Delay		46.6			38.0						14.2	
Approach LOS		D			D						B	
Queue Length 50th (ft)			179		128						486	139
Queue Length 95th (ft)			247		205						m500	m142
Internal Link Dist (ft)		739			92			465			117	
Turn Bay Length (ft)												
Base Capacity (vph)			690		461						3333	1038
Starvation Cap Reductn			0		0						0	0
Spillback Cap Reductn			0		0						0	0
Storage Cap Reductn			0		0						0	0
Reduced v/c Ratio			0.77		0.51						0.96	0.55

Intersection Summary

Area Type: Other
 Cycle Length: 100
 Actuated Cycle Length: 100
 Offset: 0 (0%), Referenced to phase 6:SBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.96
 Intersection Signal Delay: 19.2
 Intersection LOS: B
 Intersection Capacity Utilization 127.8%
 ICU Level of Service H
 Analysis Period (min) 15
 m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 4: NC 55 & Future West Connection





Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔↔			↑↑↑		
Traffic Volume (vph)	306	0	0	2464	0	0
Future Volume (vph)	306	0	0	2464	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Satd. Flow (prot)	3400	0	0	5036	0	0
Flt Permitted	0.950					
Satd. Flow (perm)	3400	0	0	5036	0	0
Right Turn on Red	No	No				No
Satd. Flow (RTOR)						
Link Speed (mph)	35			45	45	
Link Distance (ft)	161			936	544	
Travel Time (s)	3.1			14.2	8.2	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles (%)	3%	3%	3%	3%	2%	2%
Shared Lane Traffic (%)						
Lane Group Flow (vph)	340	0	0	2738	0	0
Turn Type	Prot			NA		
Protected Phases	4			2		
Permitted Phases						
Detector Phase	4			2		
Switch Phase						
Minimum Initial (s)	7.0			12.0		
Minimum Split (s)	14.0			19.0		
Total Split (s)	20.0			70.0		
Total Split (%)	22.2%			77.8%		
Yellow Time (s)	5.0			5.0		
All-Red Time (s)	2.0			2.0		
Lost Time Adjust (s)	-2.0			-2.0		
Total Lost Time (s)	5.0			5.0		
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	None			C-Max		
Act Effct Green (s)	14.4			65.6		
Actuated g/C Ratio	0.16			0.73		
v/c Ratio	0.63			0.75		
Control Delay	40.8			9.0		
Queue Delay	0.0			0.0		
Total Delay	40.8			9.0		
LOS	D			A		
Approach Delay	40.8			9.0		
Approach LOS	D			A		
Queue Length 50th (ft)	93			290		
Queue Length 95th (ft)	137			346		
Internal Link Dist (ft)	81			856	464	
Turn Bay Length (ft)						
Base Capacity (vph)	566			3672		
Starvation Cap Reductn	0			0		
Spillback Cap Reductn	0			0		
Storage Cap Reductn	0			0		
Reduced v/c Ratio	0.60			0.75		

Intersection Summary

Area Type: Other
 Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 84 (93%), Referenced to phase 2:NBT, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 12.5 Intersection LOS: B
 Intersection Capacity Utilization 65.4% ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 5: NC 55 & Future West Connection South U-Turn



SimTraffic Queuing and Blocking Reports

2022 No Build

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	96	97	404	153	22
Average Queue (ft)	53	37	269	90	7
95th Queue (ft)	102	110	522	161	28
Link Distance (ft)	870		1063	1302	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		50		100	
Storage Blk Time (%)		4	25	4	
Queuing Penalty (veh)		41	9	2	

Network Summary

Network wide Queuing Penalty: 52

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	NB	NB	SB	SB
Directions Served	LR	L	T	T	R
Maximum Queue (ft)	78	65	120	348	92
Average Queue (ft)	42	35	73	236	33
95th Queue (ft)	90	79	136	441	146
Link Distance (ft)	870		1062	1305	
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		50		100	
Storage Blk Time (%)		13	9	18	
Queuing Penalty (veh)		76	3	18	

Network Summary

Network wide Queuing Penalty: 97

2045 No Build

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	221	127	150	400	394	252	221	176
Average Queue (ft)	99	25	53	202	184	145	115	71
95th Queue (ft)	184	75	115	339	323	215	192	139
Link Distance (ft)	1822			1004	1004	1397	1397	1397
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		150	400					
Storage Blk Time (%)	3			0				
Queuing Penalty (veh)	3			0				

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	142	250	213	217	223	214	121
Average Queue (ft)	89	135	75	155	169	157	42
95th Queue (ft)	146	211	166	230	238	234	95
Link Distance (ft)	70	1938		149	149	149	149
Upstream Blk Time (%)	15			10	14	12	0
Queuing Penalty (veh)	30			84	114	98	1
Storage Bay Dist (ft)			200				
Storage Blk Time (%)		2	0				
Queuing Penalty (veh)		3	0				

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	122	233	220	195
Average Queue (ft)	97	149	124	90
95th Queue (ft)	125	213	195	164
Link Distance (ft)	51	1203	1203	1203
Upstream Blk Time (%)	70			
Queuing Penalty (veh)	121			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	394	324	119	196	204	192	107
Average Queue (ft)	236	154	65	143	155	131	44
95th Queue (ft)	351	290	122	197	204	184	91
Link Distance (ft)	742	742	60	126	126	126	126
Upstream Blk Time (%)			11	11	14	7	0
Queuing Penalty (veh)			17	71	90	47	0
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	183	610	572	472
Average Queue (ft)	157	312	282	221
95th Queue (ft)	192	510	475	392
Link Distance (ft)	107	904	904	904
Upstream Blk Time (%)	60			
Queuing Penalty (veh)	175			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	89	95	116	99
Average Queue (ft)	11	10	18	10
95th Queue (ft)	52	52	71	58
Link Distance (ft)		511	511	511
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: NC 55 & Jessie Dr North U-Turn

Movement	NB	NB	NB
Directions Served	L	T	T
Maximum Queue (ft)	109	62	10
Average Queue (ft)	32	2	0
95th Queue (ft)	90	62	7
Link Distance (ft)		572	572
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	2		

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	40	221	358	267
Average Queue (ft)	3	18	35	27
95th Queue (ft)	20	113	170	134
Link Distance (ft)		500	500	500
Upstream Blk Time (%)		0	0	0
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	150			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 15: NC 55 & Future West Connection South U-Turn

Movement	SB
Directions Served	L
Maximum Queue (ft)	83
Average Queue (ft)	28
95th Queue (ft)	72
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 857

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	143	83	110	147	118	342	319	285
Average Queue (ft)	54	27	50	75	49	211	189	159
95th Queue (ft)	108	64	94	135	101	312	293	262
Link Distance (ft)	1822			1004	1004	1397	1397	1397
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		150	400					
Storage Blk Time (%)	0							
Queuing Penalty (veh)	0							

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	133	314	263	192	204	192	79
Average Queue (ft)	75	166	102	126	141	118	27
95th Queue (ft)	132	260	213	185	204	188	64
Link Distance (ft)	70	1938		149	149	149	149
Upstream Blk Time (%)	8			3	6	3	
Queuing Penalty (veh)	15			22	37	19	
Storage Bay Dist (ft)			200				
Storage Blk Time (%)		5	0				
Queuing Penalty (veh)		11	0				

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	124	426	419	382
Average Queue (ft)	106	225	205	171
95th Queue (ft)	123	357	339	303
Link Distance (ft)	51	1203	1203	1203
Upstream Blk Time (%)	80			
Queuing Penalty (veh)	192			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	281	246	133	203	201	189	148
Average Queue (ft)	174	91	95	165	170	156	66
95th Queue (ft)	262	214	142	210	211	203	125
Link Distance (ft)	742	742	60	126	126	126	126
Upstream Blk Time (%)			26	19	20	16	1
Queuing Penalty (veh)			55	148	158	127	6
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	168	298	270	208
Average Queue (ft)	119	176	135	95
95th Queue (ft)	172	264	232	183
Link Distance (ft)	107	904	904	904
Upstream Blk Time (%)	34			
Queuing Penalty (veh)	61			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	60	136	156	247
Average Queue (ft)	4	33	48	47
95th Queue (ft)	28	104	131	161
Link Distance (ft)		511	511	511
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: NC 55 & Jessie Dr North U-Turn

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	229	107	112	112
Average Queue (ft)	99	12	12	11
95th Queue (ft)	222	138	138	134
Link Distance (ft)		572	572	572
Upstream Blk Time (%)		0	0	0
Queuing Penalty (veh)		1	0	0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)	9			
Queuing Penalty (veh)	75			

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	102	45	46	54
Average Queue (ft)	20	2	3	3
95th Queue (ft)	71	25	25	26
Link Distance (ft)		500	500	500
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150			
Storage Blk Time (%)	0	0		
Queuing Penalty (veh)	0	0		

Intersection: 15: NC 55 & Future West Connection South U-Turn

Movement	SB	SB
Directions Served	L	T
Maximum Queue (ft)	31	89
Average Queue (ft)	2	1
95th Queue (ft)	15	42
Link Distance (ft)		494
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	200	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 927

2022 Build – 2 Southbound NC 55 Lanes

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	192	184	232	357	295	199
Average Queue (ft)	90	73	110	162	149	32
95th Queue (ft)	162	145	190	312	253	113
Link Distance (ft)	8156		989		1400	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		300		100	
Storage Blk Time (%)	0	0	0	1	18	0
Queuing Penalty (veh)	0	0	1	1	14	0

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB
Directions Served	T	R	R	T	T	TR
Maximum Queue (ft)	109	155	140	314	285	278
Average Queue (ft)	73	81	75	195	178	147
95th Queue (ft)	109	137	129	283	270	247
Link Distance (ft)	27	8156		1287	1287	1287
Upstream Blk Time (%)	39					
Queuing Penalty (veh)	89					
Storage Bay Dist (ft)			200			
Storage Blk Time (%)	0					
Queuing Penalty (veh)	0					

Intersection: 3: NC 55 & Jessie Drive North U-Turn

Movement	WB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	104	353	335
Average Queue (ft)	56	173	151
95th Queue (ft)	97	305	279
Link Distance (ft)	51	1398	1398
Upstream Blk Time (%)	13		
Queuing Penalty (veh)	14		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: NC 55 & Jessie Drive

Movement	SB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	146	18	4
Average Queue (ft)	33	0	0
95th Queue (ft)	106	0	4
Link Distance (ft)		559	559
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	200		
Storage Blk Time (%)	0		
Queuing Penalty (veh)	0		

Intersection: 11: NC 55 & Jessie Drive North U-Turn

Movement	NB
Directions Served	L
Maximum Queue (ft)	30
Average Queue (ft)	2
95th Queue (ft)	16
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 121

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	132	156	192	125	770	198
Average Queue (ft)	72	89	140	56	456	109
95th Queue (ft)	157	179	209	143	986	250
Link Distance (ft)	8156		989		1400	
Upstream Blk Time (%)						0
Queuing Penalty (veh)						0
Storage Bay Dist (ft)	200		300		100	
Storage Blk Time (%)	0	1			29	0
Queuing Penalty (veh)	0	1			49	5

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB
Directions Served	T	R	R	T	T	TR
Maximum Queue (ft)	78	130	128	234	219	174
Average Queue (ft)	52	88	82	178	154	113
95th Queue (ft)	89	149	150	258	244	207
Link Distance (ft)	27	8156		1287	1287	1287
Upstream Blk Time (%)	19					
Queuing Penalty (veh)	33					
Storage Bay Dist (ft)				200		
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: NC 55 & Jessie Drive North U-Turn

Movement	WB	SB	SB
Directions Served	L	T	T
Maximum Queue (ft)	104	389	378
Average Queue (ft)	77	254	229
95th Queue (ft)	132	459	437
Link Distance (ft)	51	1398	1398
Upstream Blk Time (%)	37		
Queuing Penalty (veh)	69		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: NC 55 & Jessie Drive

Movement	SB
Directions Served	L
Maximum Queue (ft)	24
Average Queue (ft)	6
95th Queue (ft)	30
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NC 55 & Jessie Drive North U-Turn

Movement	NB
Directions Served	L
Maximum Queue (ft)	68
Average Queue (ft)	28
95th Queue (ft)	91
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 157

2022 Build – 3 Southbound NC 55 Lanes

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	175	176	281	458	328	185
Average Queue (ft)	89	67	114	184	157	36
95th Queue (ft)	152	141	221	386	264	122
Link Distance (ft)	8156		989		1400	
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			0			
Storage Bay Dist (ft)	200		300		100	
Storage Blk Time (%)	0	0	2	19	0	
Queuing Penalty (veh)	0	0	3	15	0	

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB
Directions Served	T	R	R	T	T	TR
Maximum Queue (ft)	105	155	144	332	298	271
Average Queue (ft)	69	79	71	201	178	151
95th Queue (ft)	110	134	125	292	271	247
Link Distance (ft)	27	8156		1287	1287	1287
Upstream Blk Time (%)	34					
Queuing Penalty (veh)	77					
Storage Bay Dist (ft)			200			
Storage Blk Time (%)			0			
Queuing Penalty (veh)			0			

Intersection: 3: NC 55 & Jessie Drive North U-Turn

Movement	WB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	97	209	188	145
Average Queue (ft)	52	120	95	57
95th Queue (ft)	90	192	167	121
Link Distance (ft)	51	1398	1398	1398
Upstream Blk Time (%)	8			
Queuing Penalty (veh)	9			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: NC 55 & Jessie Drive

Movement	SB
Directions Served	L
Maximum Queue (ft)	130
Average Queue (ft)	28
95th Queue (ft)	94
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NC 55 & Jessie Drive North U-Turn

Movement	NB	NB
Directions Served	L	T
Maximum Queue (ft)	8	5
Average Queue (ft)	0	0
95th Queue (ft)	5	5
Link Distance (ft)	581	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 105

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	102	153	216	85	775	200
Average Queue (ft)	52	80	145	48	466	93
95th Queue (ft)	120	163	243	98	890	237
Link Distance (ft)	8156		989		1400	
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	200		300		100	
Storage Blk Time (%)	0				31	
Queuing Penalty (veh)	0				53	

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB
Directions Served	T	R	R	T	T	TR
Maximum Queue (ft)	81	122	115	217	199	148
Average Queue (ft)	52	82	74	167	145	94
95th Queue (ft)	96	136	129	245	224	182
Link Distance (ft)	27	8156		1287	1287	1287
Upstream Blk Time (%)	18					
Queuing Penalty (veh)	30					
Storage Bay Dist (ft)			200			
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: NC 55 & Jessie Drive North U-Turn

Movement	WB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	102	188	156	143
Average Queue (ft)	67	135	114	85
95th Queue (ft)	116	201	176	155
Link Distance (ft)	51	1398	1398	1398
Upstream Blk Time (%)	21			
Queuing Penalty (veh)	39			
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 5: NC 55 & Jessie Drive

Movement	SB
Directions Served	L
Maximum Queue (ft)	28
Average Queue (ft)	7
95th Queue (ft)	37
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	200
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 11: NC 55 & Jessie Drive North U-Turn

Movement	NB
Directions Served	L
Maximum Queue (ft)	31
Average Queue (ft)	7
95th Queue (ft)	40
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	250
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 122

2035 Build

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	158	96	204	157	204	138	137	92
Average Queue (ft)	85	79	117	110	126	106	73	57
95th Queue (ft)	151	106	200	179	193	157	148	102
Link Distance (ft)	8071		985		985	1423	1423	1423
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)	250		400					
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	136	153	132	181	201	186	157
Average Queue (ft)	91	111	83	154	185	149	110
95th Queue (ft)	144	161	133	186	217	192	162
Link Distance (ft)	77	8071		144	144	144	144
Upstream Blk Time (%)	11			9	10	2	4
Queuing Penalty (veh)	31			69	78	16	29
Storage Bay Dist (ft)			300				
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	74	86	158	117	96
Average Queue (ft)	45	59	95	80	50
95th Queue (ft)	86	97	180	147	105
Link Distance (ft)	39	39	1196	1196	1196
Upstream Blk Time (%)	42	53			
Queuing Penalty (veh)	55	68			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	336	234	57	174	174	150	83
Average Queue (ft)	259	116	39	138	157	128	42
95th Queue (ft)	401	241	64	201	183	149	88
Link Distance (ft)	738	738	60	119	119	119	119
Upstream Blk Time (%)			2	15	20	8	
Queuing Penalty (veh)			4	85	120	48	
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	EB	NB	NB	NB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	131	129	220	208	135
Average Queue (ft)	100	119	182	161	116
95th Queue (ft)	135	146	230	203	138
Link Distance (ft)	89	89	896	896	896
Upstream Blk Time (%)	37	61			
Queuing Penalty (veh)	75	125			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	91	34	56	38
Average Queue (ft)	18	7	17	8
95th Queue (ft)	78	30	53	32
Link Distance (ft)		504	504	504
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: NC 55 & Jessie Dr North U-Turn

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

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB
Directions Served	T	T
Maximum Queue (ft)	30	38
Average Queue (ft)	9	8
95th Queue (ft)	29	33
Link Distance (ft)	491	491
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 15: NC 55 & Future West Connection South U-Turn

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

Network Summary

Network wide Queuing Penalty: 804

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	118	137	157	89	67	248	237	216
Average Queue (ft)	68	82	110	51	36	191	172	150
95th Queue (ft)	132	154	172	102	76	274	267	241
Link Distance (ft)	8071			985	985	1423	1423	1423
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)		250	400					
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	116	244	161	193	198	169	125
Average Queue (ft)	74	185	118	156	163	135	59
95th Queue (ft)	133	267	186	213	222	189	133
Link Distance (ft)	77	8071		144	144	144	144
Upstream Blk Time (%)	6			11	14	4	1
Queuing Penalty (veh)	13			64	84	26	7
Storage Bay Dist (ft)			300				
Storage Blk Time (%)		0					
Queuing Penalty (veh)		1					

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	99	114	227	210	202
Average Queue (ft)	76	93	178	158	142
95th Queue (ft)	118	139	274	251	239
Link Distance (ft)	39	39	1196	1196	1196
Upstream Blk Time (%)	61	71			
Queuing Penalty (veh)	134	156			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	262	200	114	174	176	169	110
Average Queue (ft)	188	103	71	136	149	127	76
95th Queue (ft)	305	244	121	192	200	192	130
Link Distance (ft)	738	738	60	119	119	119	119
Upstream Blk Time (%)			17	12	16	10	1
Queuing Penalty (veh)			30	92	121	76	11
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	EB	NB	NB	NB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	81	90	184	144	133
Average Queue (ft)	62	73	144	99	81
95th Queue (ft)	90	104	216	178	146
Link Distance (ft)	89	89	896	896	896
Upstream Blk Time (%)	4	14			
Queuing Penalty (veh)	5	17			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	16	39	51	59
Average Queue (ft)	4	10	17	16
95th Queue (ft)	30	45	54	63
Link Distance (ft)		504	504	504
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	200			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 11: NC 55 & Jessie Dr North U-Turn

Movement	NB	NB
Directions Served	L	L
Maximum Queue (ft)	28	37
Average Queue (ft)	7	17
95th Queue (ft)	29	52
Link Distance (ft)		
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)	250	250
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	21	36	47	16
Average Queue (ft)	4	9	13	5
95th Queue (ft)	25	45	59	34
Link Distance (ft)		491	491	491
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	150			
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 15: NC 55 & Future West Connection South U-Turn

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

Network Summary

Network wide Queuing Penalty: 835

2045 Build

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	340	178	307	437	428	287	253	219
Average Queue (ft)	188	86	145	224	213	181	153	115
95th Queue (ft)	302	158	236	363	351	253	231	196
Link Distance (ft)	8075	8075		985	985	1411	1411	1411
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			400					
Storage Blk Time (%)				1				
Queuing Penalty (veh)				2				

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	156	499	328	239	230	216	213
Average Queue (ft)	119	268	158	205	205	186	160
95th Queue (ft)	166	470	272	226	220	224	232
Link Distance (ft)	77	8075	8075	145	145	145	145
Upstream Blk Time (%)	21			32	34	23	16
Queuing Penalty (veh)	74			276	291	193	134
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	111	122	698	662	580
Average Queue (ft)	86	101	370	330	273
95th Queue (ft)	112	125	835	792	676
Link Distance (ft)	39	39	1196	1196	1196
Upstream Blk Time (%)	68	75	1	0	0
Queuing Penalty (veh)	117	130	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	620	520	116	204	204	192	172
Average Queue (ft)	355	219	37	177	177	168	88
95th Queue (ft)	571	460	86	193	191	194	155
Link Distance (ft)	738	738	60	119	119	119	119
Upstream Blk Time (%)	1		3	47	48	41	7
Queuing Penalty (veh)	0		5	299	307	260	44
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	EB	NB	NB	NB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	145	171	802	792	803
Average Queue (ft)	103	130	413	386	371
95th Queue (ft)	136	168	802	772	772
Link Distance (ft)	89	89	896	896	896
Upstream Blk Time (%)	46	63	3	2	5
Queuing Penalty (veh)	120	164	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	269	483	490	482
Average Queue (ft)	118	262	278	282
95th Queue (ft)	320	549	550	567
Link Distance (ft)		504	504	504
Upstream Blk Time (%)		0	1	1
Queuing Penalty (veh)		4	7	9
Storage Bay Dist (ft)	200			
Storage Blk Time (%)	0	20		
Queuing Penalty (veh)	0	72		

Intersection: 11: NC 55 & Jessie Dr North U-Turn

Movement	NB	NB	NB
Directions Served	L	L	T
Maximum Queue (ft)	51	58	60
Average Queue (ft)	8	12	2
95th Queue (ft)	34	41	60
Link Distance (ft)			566
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)	250	250	
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	206	431	492	447
Average Queue (ft)	15	189	213	228
95th Queue (ft)	108	345	403	429
Link Distance (ft)		491	491	491
Upstream Blk Time (%)		0	0	
Queuing Penalty (veh)		0	1	
Storage Bay Dist (ft)	150			
Storage Blk Time (%)		16		
Queuing Penalty (veh)		29		

Intersection: 15: NC 55 & Future West Connection South U-Turn

Movement	SB	SB	SB	SB
Directions Served	L	L	T	T
Maximum Queue (ft)	5	23	100	52
Average Queue (ft)	0	2	3	2
95th Queue (ft)	3	14	72	52
Link Distance (ft)			495	495
Upstream Blk Time (%)			0	0
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)	150	150		
Storage Blk Time (%)				
Queuing Penalty (veh)				

Network Summary

Network wide Queuing Penalty: 2536

Intersection: 1: Ten Ten Road & Jessie Drive

Movement	EB	EB	NB	NB	NB	SB	SB	SB
Directions Served	L	R	L	T	T	T	T	TR
Maximum Queue (ft)	206	228	277	162	145	561	557	525
Average Queue (ft)	112	112	146	72	58	305	286	270
95th Queue (ft)	187	195	237	132	118	492	478	468
Link Distance (ft)	8075	8075		985	985	1411	1411	1411
Upstream Blk Time (%)								
Queuing Penalty (veh)								
Storage Bay Dist (ft)			400					
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: NC 55 & Jessie Drive

Movement	EB	WB	WB	NB	NB	NB	NB
Directions Served	T	R	R	T	T	T	R
Maximum Queue (ft)	149	870	663	230	233	220	209
Average Queue (ft)	88	531	202	200	203	186	113
95th Queue (ft)	158	1012	453	227	223	226	194
Link Distance (ft)	77	8075	8075	145	145	145	145
Upstream Blk Time (%)	15			37	40	27	7
Queuing Penalty (veh)	44			240	257	175	45
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 3: NC 55 & Jessie Dr North U-Turn

Movement	WB	WB	SB	SB	SB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	123	144	965	920	885
Average Queue (ft)	99	112	494	459	423
95th Queue (ft)	116	126	948	908	870
Link Distance (ft)	39	39	1196	1196	1196
Upstream Blk Time (%)	53	61	2	1	2
Queuing Penalty (veh)	154	176	0	0	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 4: NC 55 & Future West Connection

Movement	EB	EB	WB	SB	SB	SB	SB
Directions Served	R	R	T	T	T	T	R
Maximum Queue (ft)	549	469	131	205	206	186	176
Average Queue (ft)	338	243	86	175	177	160	110
95th Queue (ft)	588	498	142	200	191	197	181
Link Distance (ft)	738	738	60	119	119	119	119
Upstream Blk Time (%)	3	0	29	28	30	21	9
Queuing Penalty (veh)	0	0	61	235	251	182	78
Storage Bay Dist (ft)							
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 5: NC 55 & Future West Connection South U-Turn

Movement	EB	EB	NB	NB	NB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	117	142	396	349	280
Average Queue (ft)	79	101	188	148	117
95th Queue (ft)	120	146	355	315	255
Link Distance (ft)	89	89	896	896	896
Upstream Blk Time (%)	17	29			
Queuing Penalty (veh)	25	44			
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 7: NC 55 & Jessie Drive

Movement	SB	SB	SB	SB
Directions Served	L	T	T	T
Maximum Queue (ft)	181	348	368	356
Average Queue (ft)	19	143	165	172
95th Queue (ft)	92	287	299	326
Link Distance (ft)		504	504	504
Upstream Blk Time (%)		0	0	0
Queuing Penalty (veh)		0	0	0
Storage Bay Dist (ft)	200			
Storage Blk Time (%)		3		
Queuing Penalty (veh)		8		

Intersection: 11: NC 55 & Jessie Dr North U-Turn

Movement	NB	NB	NB	NB	NB
Directions Served	L	L	T	T	T
Maximum Queue (ft)	100	120	56	123	2
Average Queue (ft)	56	73	2	4	0
95th Queue (ft)	101	118	57	88	2
Link Distance (ft)			566	566	566
Upstream Blk Time (%)				0	
Queuing Penalty (veh)				0	
Storage Bay Dist (ft)	250	250			
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 13: NC 55 & Future West Connection

Movement	NB	NB	NB	NB
Directions Served	L	T	T	T
Maximum Queue (ft)	233	418	447	447
Average Queue (ft)	55	165	177	168
95th Queue (ft)	204	428	442	446
Link Distance (ft)		491	491	491
Upstream Blk Time (%)		0	0	0
Queuing Penalty (veh)		2	4	3
Storage Bay Dist (ft)	150			
Storage Blk Time (%)	0	14		
Queuing Penalty (veh)	0	29		

Intersection: 15: NC 55 & Future West Connection South U-Turn

Movement	SB	SB	SB
Directions Served	T	T	T
Maximum Queue (ft)	49	99	6
Average Queue (ft)	2	3	0
95th Queue (ft)	49	71	8
Link Distance (ft)	495	495	495
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Network Summary

Network wide Queuing Penalty: 2015

U-5825 Roadway Concept Exhibits



Appendix E: Public Meeting Maps

DESIGN DATA

-L- SR 1304 (JESSIE DRIVE)
FUNCTIONAL CLASS = THOROUGHFARE
DESIGN SPEED = 50 MPH
MAX SUPERELEVATION = 0.04

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DESIGN DATA

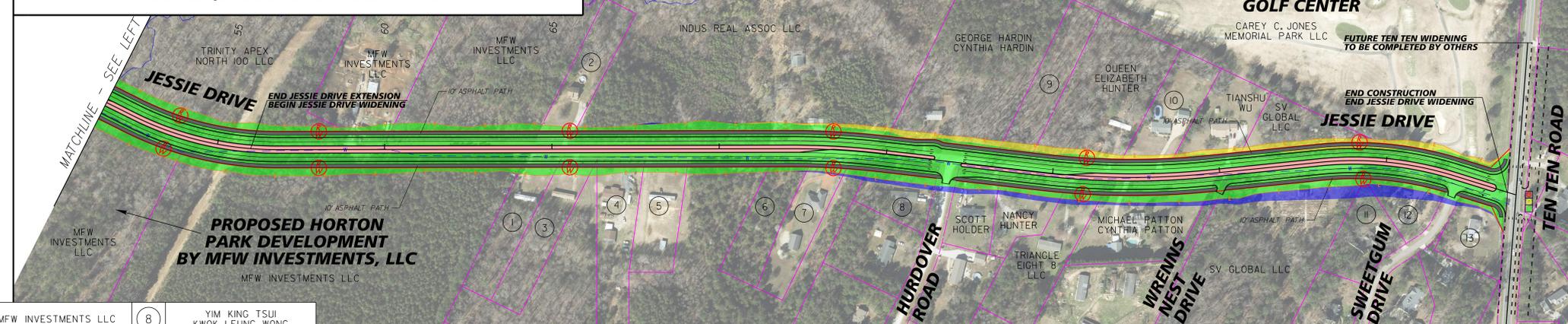
-L- SR 1304 (JESSIE DRIVE)
FUNCTIONAL CLASS = THOROUGHFARE
DESIGN SPEED = 50 MPH
MAX SUPERELEVATION = 0.04

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

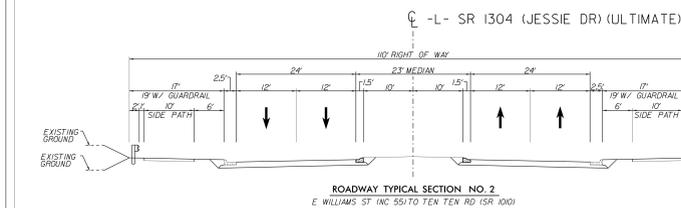
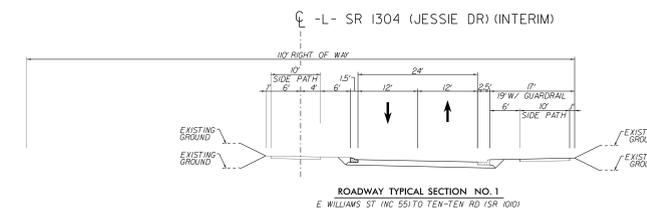
ALTERNATIVE 1 - WIDENING TO THE SOUTH



ALTERNATIVE 2 - BEST FIT



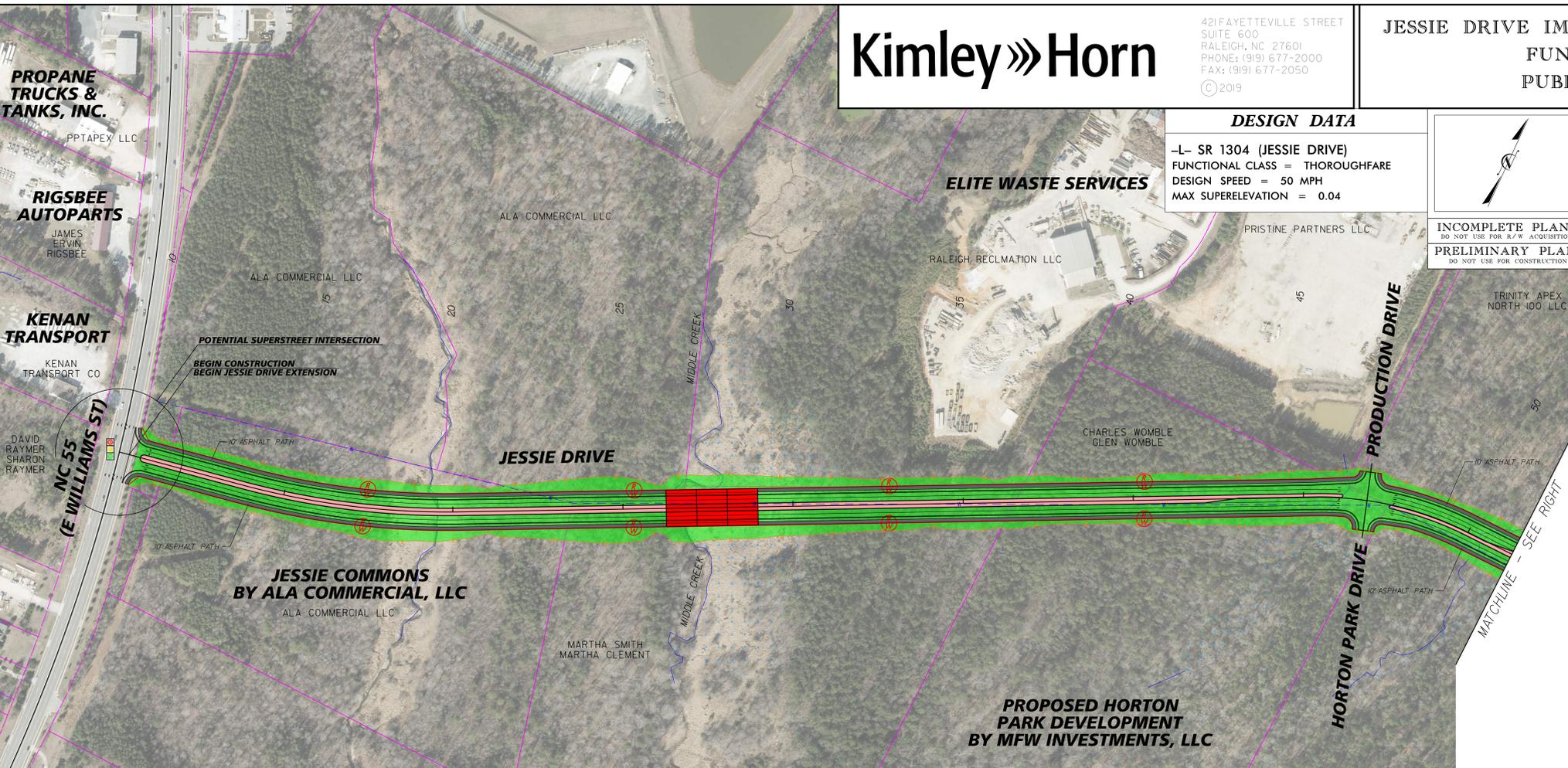
1	MFW INVESTMENTS LLC	8	YIM KING TSUI KWOK LEUNG WONG
2	BLANCHE HINTON	9	ANANTHA SRINIVASA RAO VANI PADMAJJA YALAMANCHI
3	MELVIN HUNTER NICOLE HUNTER	10	DAVID WHITE KENNETH WHITE
4	JOE ELLIS TOOMER FANNIR TOOMER	11	BRENT EMORY CADD LESLIE CADD
5	BLANCHE HINTON	12	JESS HYDE RENEE LYNN HYDE
6	JOSEPH GRIFFIN	13	ROBERT LEON UNDERWOOD
7	BLANCHE HINTON	14	MATTHEWS FAMILY CEMETERY



NOTE: THE INTERIM TYPICAL SECTION IS HALF OF THE ULTIMATE TYPICAL SECTION BUILT ON FULL WIDTH RIGHT-OF-WAY.

LEGEND

	PROPOSED PLANTED/ CONCRETE MEDIAN		POTENTIAL PROPOSED TRAFFIC SIGNAL
	PROPOSED ASPHALT MULTI-USE PATH		PROPOSED RIGHT-OF-WAY
	PROPOSED BRIDGE		TEMPORARY CONSTRUCTION EASEMENT
	ALTERNATIVE 1 POTENTIAL IMPACT AREA		EXIST WATER LINE
	ALTERNATIVE 2 POTENTIAL IMPACT AREA		EXIST PROPERTY LINES
	ALTERNATIVE 1 & 2 POTENTIAL IMPACT AREA		STREAMS
	WETLANDS		



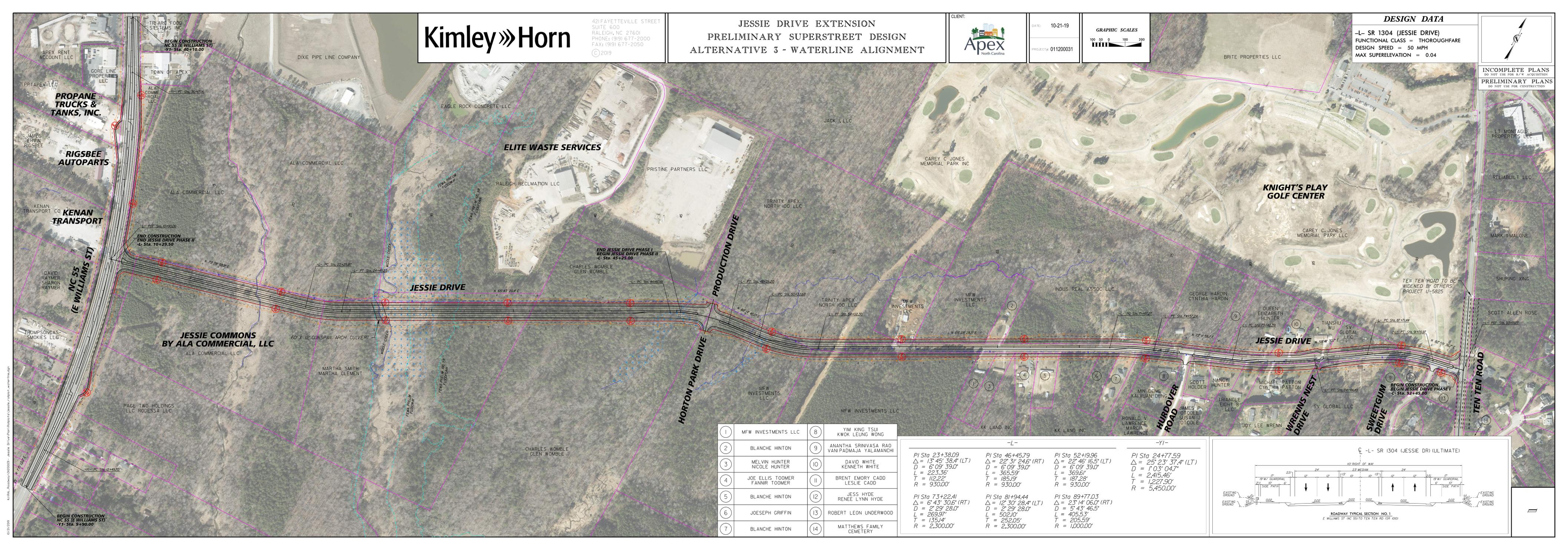


Appendix F: Functional Designs



-L- SR 1304 (JESSIE DRIVE)
FUNCTIONAL CLASS = THOROUGHFARE
DESIGN SPEED = 50 MPH
MAX SUPERELEVATION = 0.04

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



1	MFW INVESTMENTS LLC	8	YIM KING TSUI KWOK LEUNG WONG
2	BLANCHE HINTON	9	ANANTHA SRINIVASA RAO VANI PADMAJA YALAMANCHI
3	MELVIN HUNTER NICOLE HUNTER	10	DAVID WHITE KENNETH WHITE
4	JOE ELLIS TOOMER FANNIR TOOMER	11	BRENT EMORY CADD LESLIE CADD
5	BLANCHE HINTON	12	JESS HYDE RENEE LYNN HYDE
6	JOSEPH GRIFFIN	13	ROBERT LEON UNDERWOOD
7	BLANCHE HINTON	14	MATTHEWS FAMILY CEMETERY

-L-			-YI-		
PI Sta 23+38.09	PI Sta 46+45.79	PI Sta 52+9.96	PI Sta 24+77.59		
$\Delta = 13^{\circ} 45' 38.4" (LT)$	$\Delta = 22^{\circ} 31' 24.6" (RT)$	$\Delta = 22^{\circ} 46' 16.5" (LT)$	$\Delta = 25^{\circ} 23' 37.4" (LT)$		
$D = 6^{\circ} 09' 39.0"$	$D = 6^{\circ} 09' 39.0"$	$D = 6^{\circ} 09' 39.0"$	$D = 1^{\circ} 03' 04.7"$		
$L = 223.36'$	$L = 365.59'$	$L = 365.59'$	$L = 2,415.46'$		
$T = 112.22'$	$T = 185.19'$	$T = 187.28'$	$T = 1,227.90'$		
$R = 930.00'$	$R = 930.00'$	$R = 930.00'$	$R = 5,450.00'$		
PI Sta 73+22.41	PI Sta 81+94.44	PI Sta 89+77.03			
$\Delta = 6^{\circ} 43' 30.6" (RT)$	$\Delta = 12^{\circ} 30' 28.4" (LT)$	$\Delta = 23^{\circ} 14' 06.0" (RT)$			
$D = 2^{\circ} 29' 28.0"$	$D = 2^{\circ} 29' 28.0"$	$D = 5^{\circ} 43' 46.5"$			
$L = 269.97'$	$L = 502.10'$	$L = 405.53'$			
$T = 135.4'$	$T = 252.05'$	$T = 205.59'$			
$R = 2,300.00'$	$R = 2,300.00'$	$R = 1,000.00'$			

