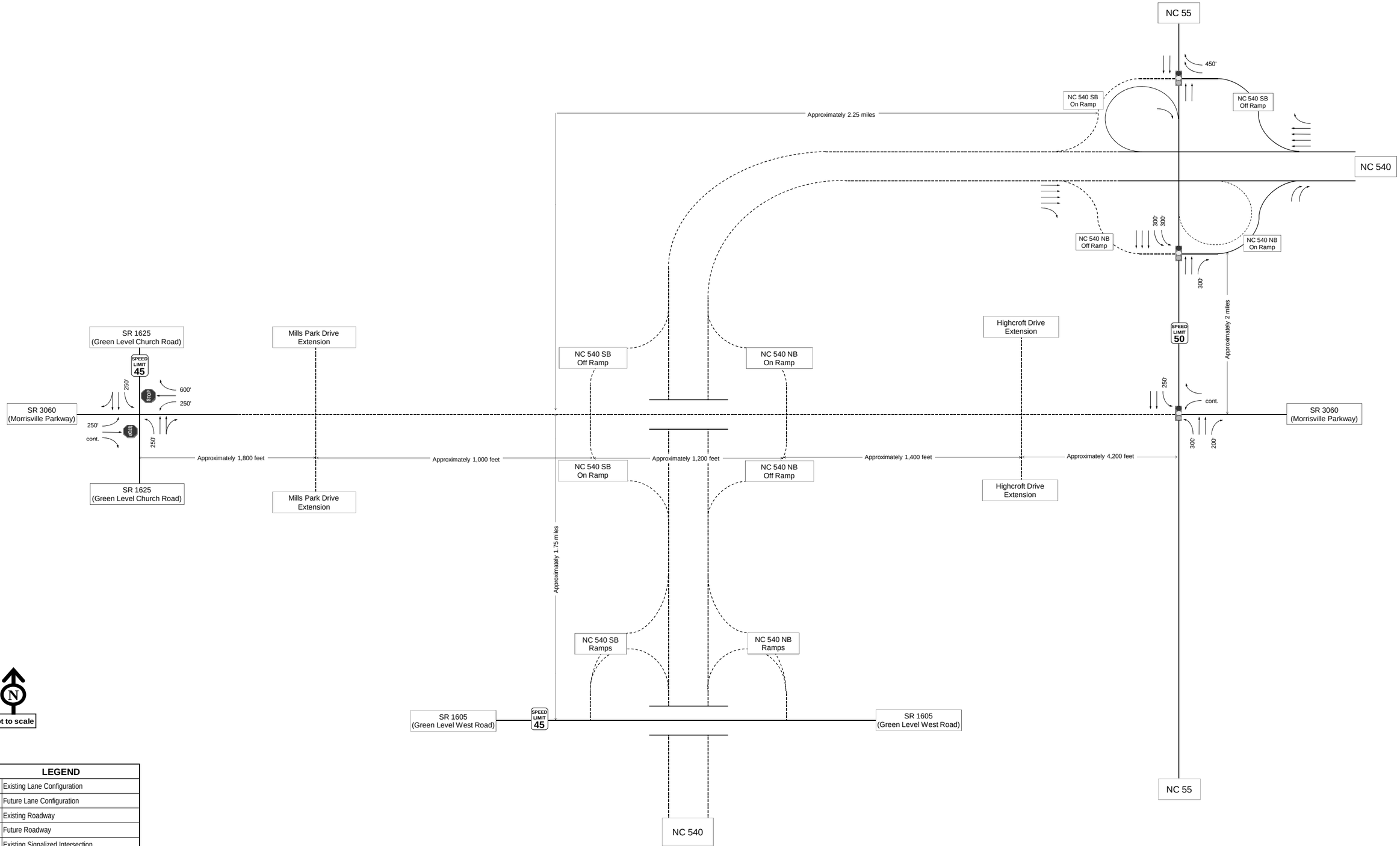
Appendix A

Traffic Capacity Analysis Figures

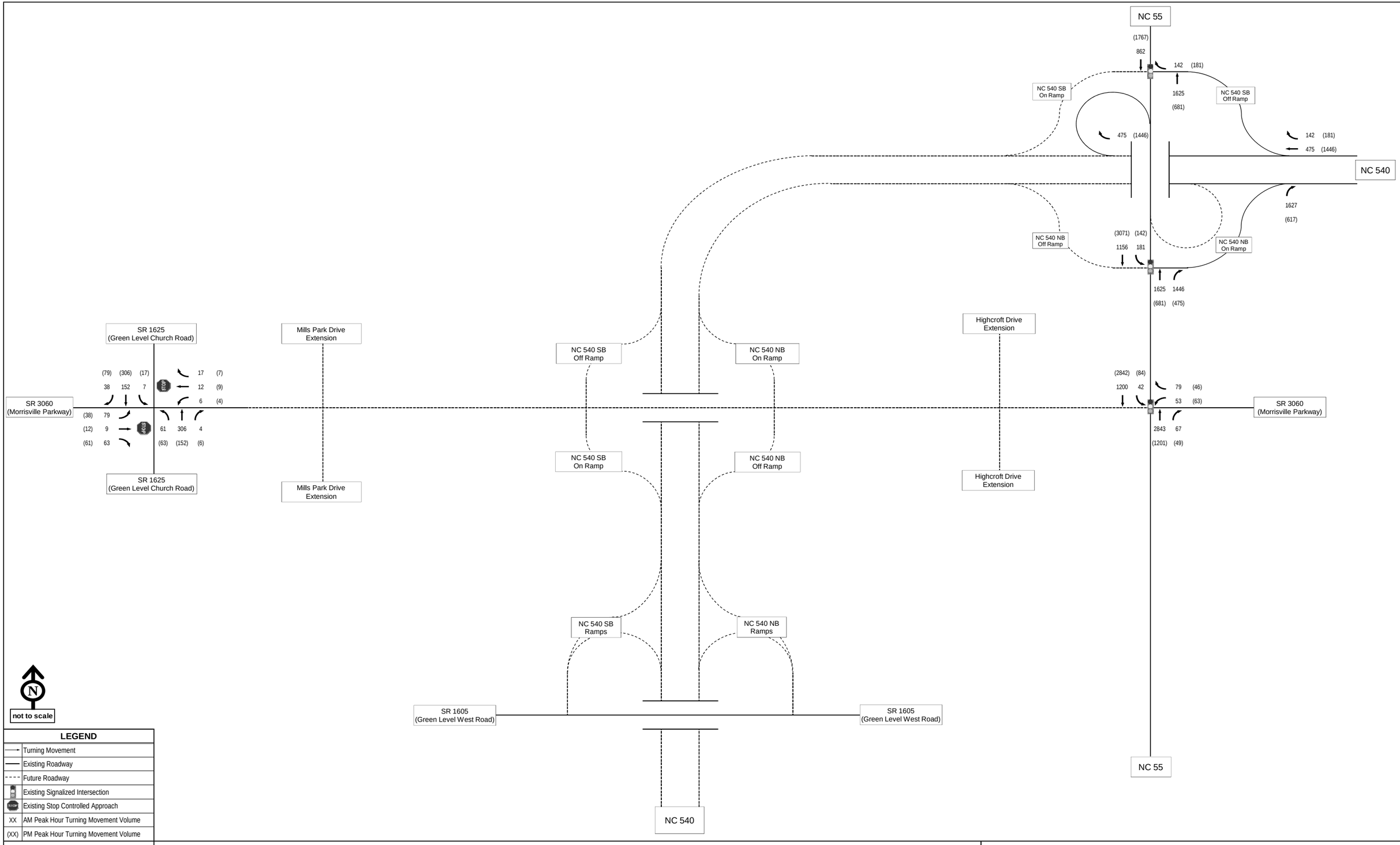


LEGEND
Existing Lane Configuration
Future Lane Configuration
Existing Roadway
Future Roadway
Existing Signalized Intersection
Existing Stop Controlled Approach

MARTIN ALEXIOU BRYSON

Figure A-1
Base Year (2010) No-Build Lane Geometrics and Traffic Control

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

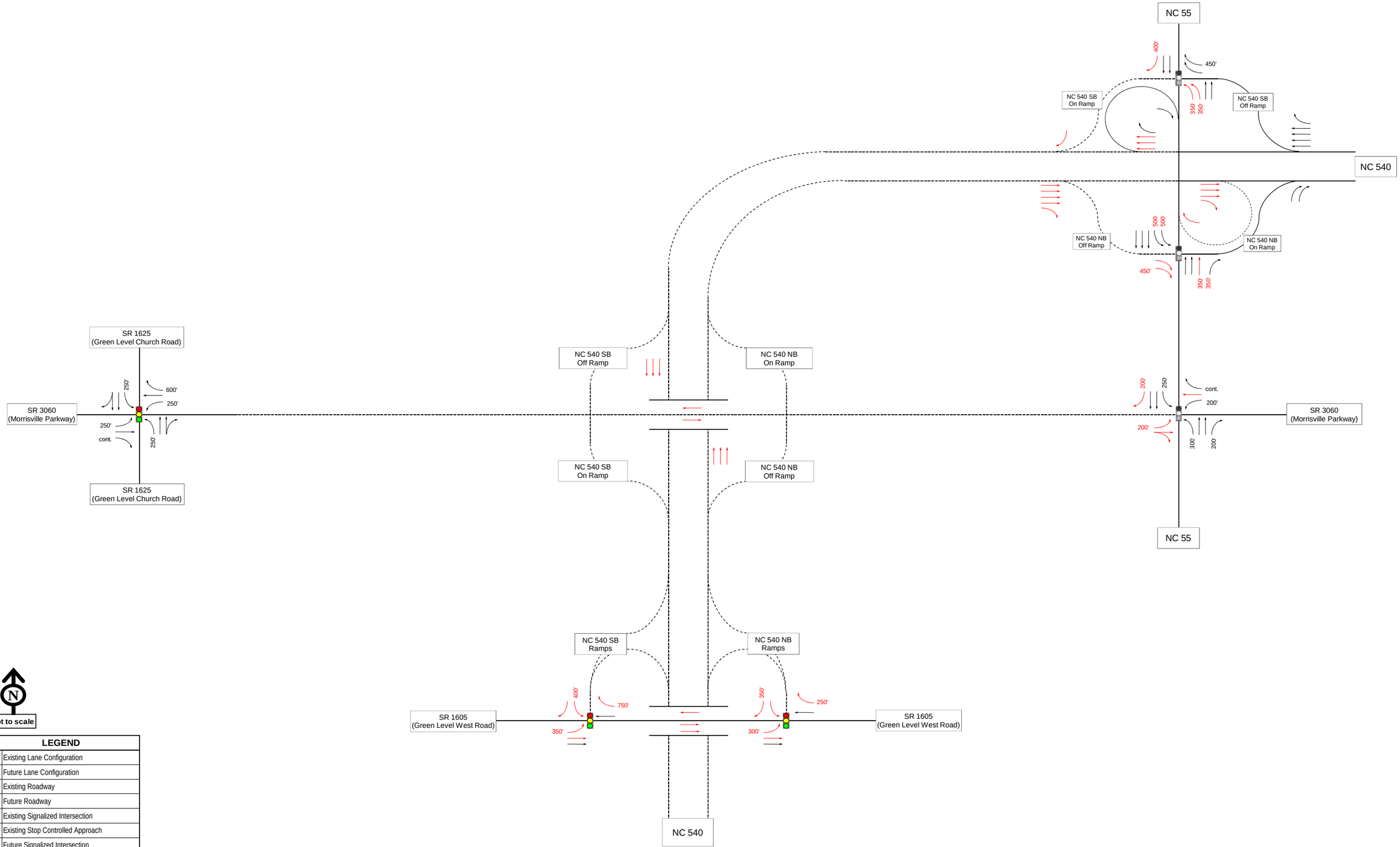


LEGEND	
	Turning Movement
	Existing Roadway
	Future Roadway
	Existing Signalized Intersection
	Existing Stop Controlled Approach
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

MARTIN ALEXIOU BRYSON

Figure A-2
Base Year (2010) No-Build AM and PM Peak Hour Volumes

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

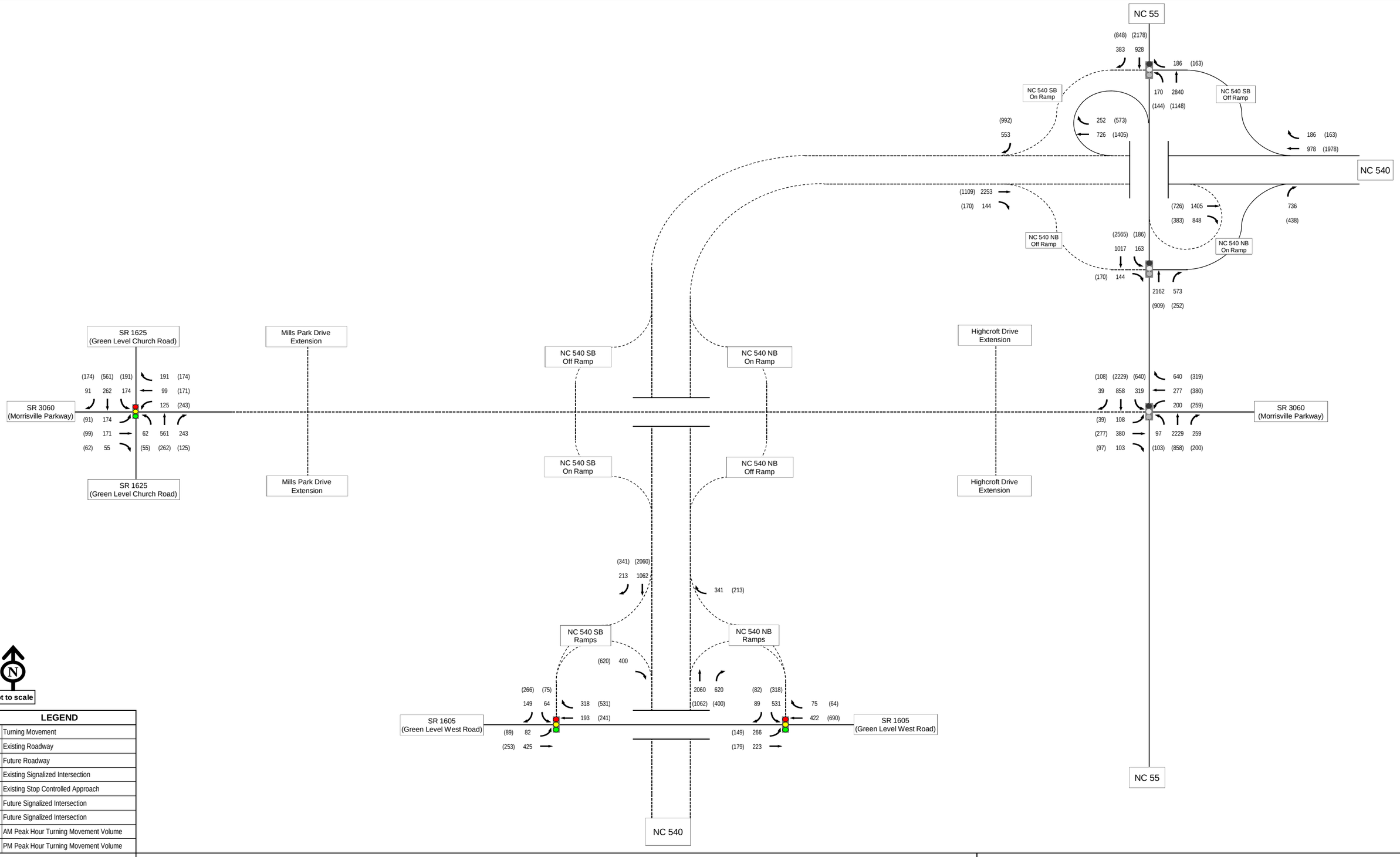


LEGEND
Existing Lane Configuration
Future Lane Configuration
Existing Roadway
Future Roadway
Existing Signalized Intersection
Existing Stop Controlled Approach
Future Signalized Intersection
Future Stop Controlled Approach

MARTIN ALEXIOU BRYSON

Figure A-3
Opening Year (2015) No-Build Lane Geometrics and Traffic Control

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC



LEGEND	
→	Turning Movement
———	Existing Roadway
- - -	Future Roadway
	Existing Signalized Intersection
STOP	Existing Stop Controlled Approach
	Future Signalized Intersection
STOP	Future Signalized Intersection
XX	AM Peak Hour Turning Movement Volume
(XX)	PM Peak Hour Turning Movement Volume

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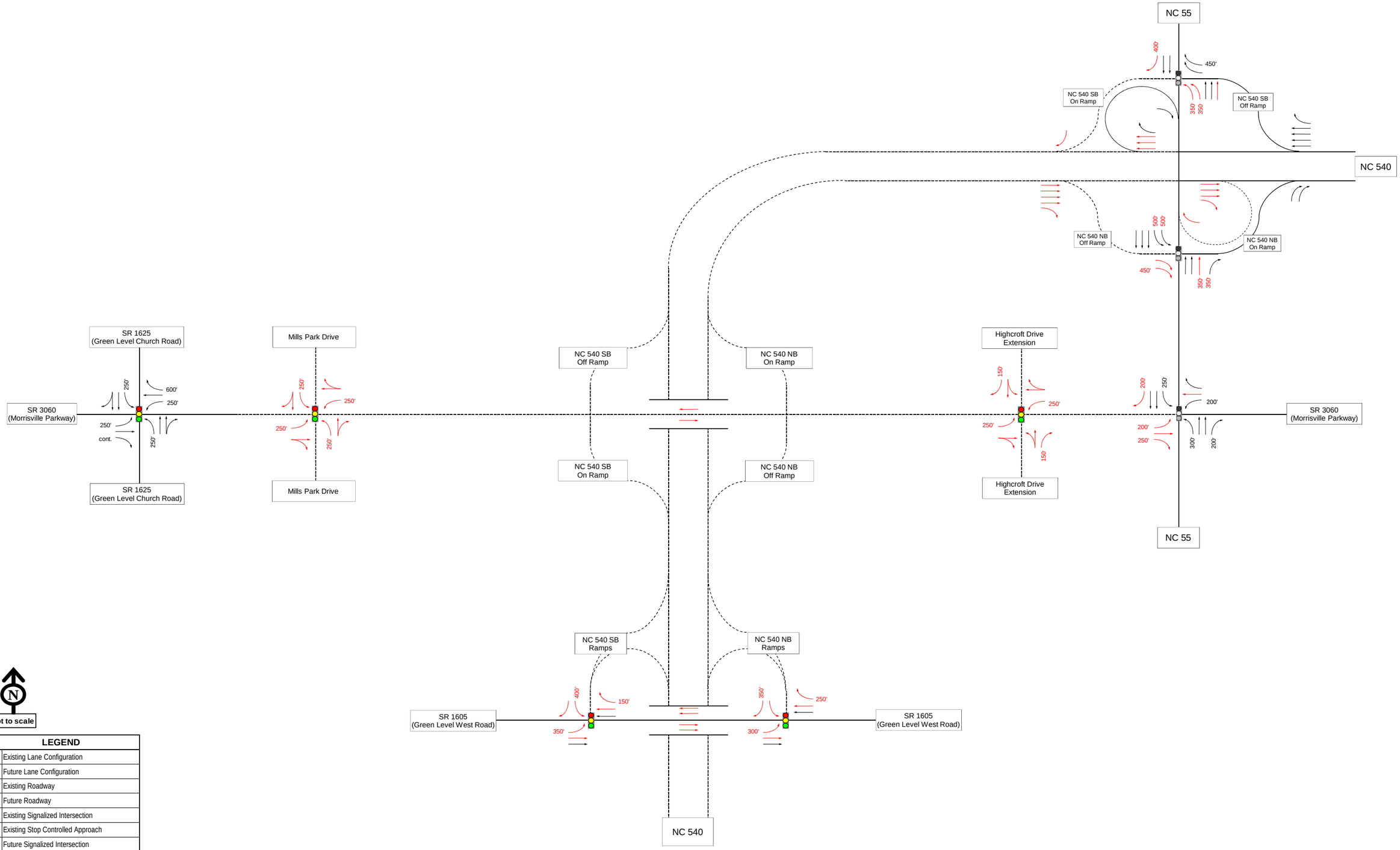
Figure A-4
Opening Year (2015) No-Build AM and PM Peak Hour Volumes

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC



LEGEND
Existing Lane Configuration
Future Lane Configuration
Existing Roadway
Future Roadway
Existing Signalized Intersection
Existing Stop Controlled Approach
Future Signalized Intersection
Future Stop Controlled Approach

MARTIN ALEXIOU BRYSON

Figure A-5
Design Year (2035) No-Build Lane Geometrics and Traffic Control

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

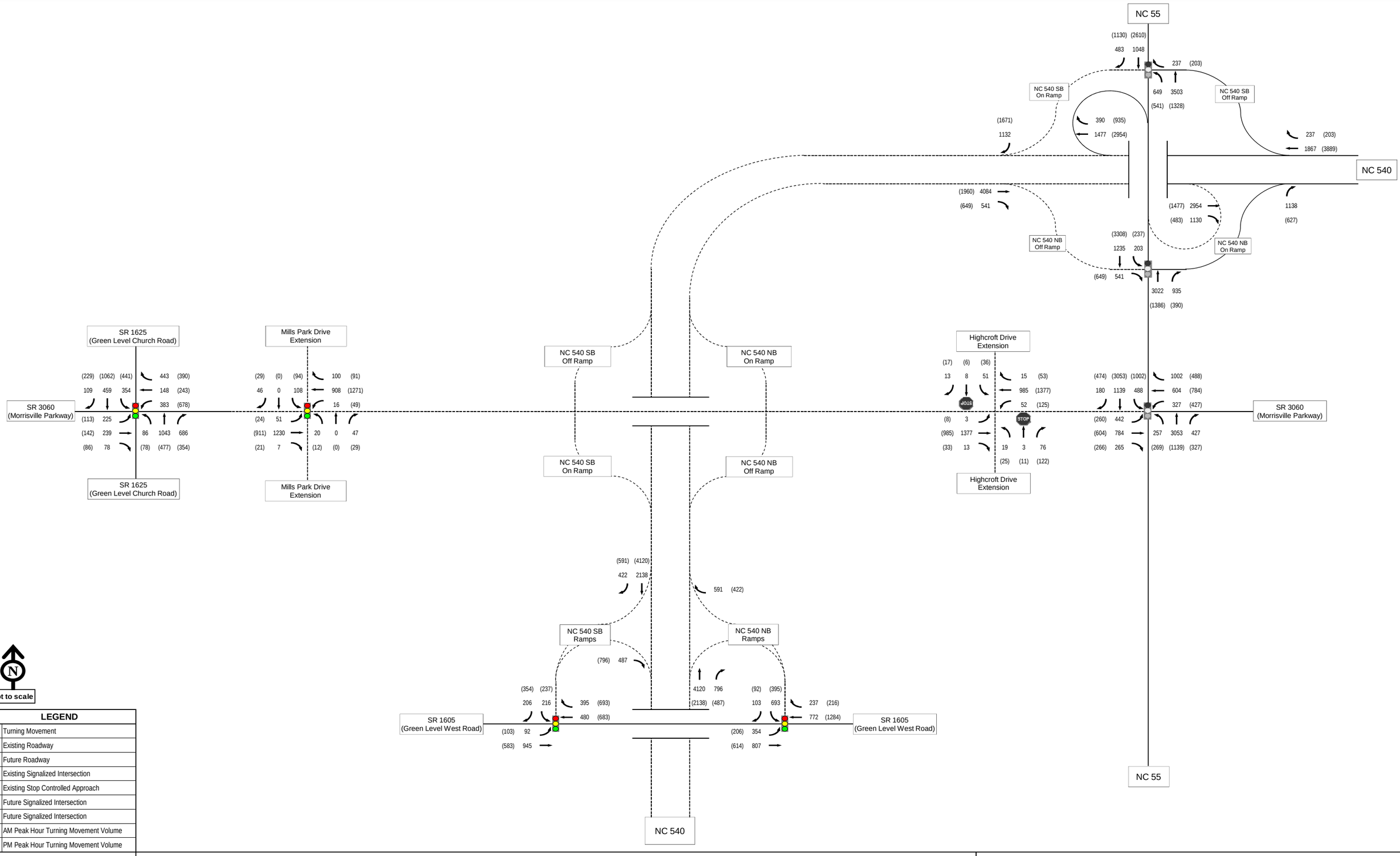
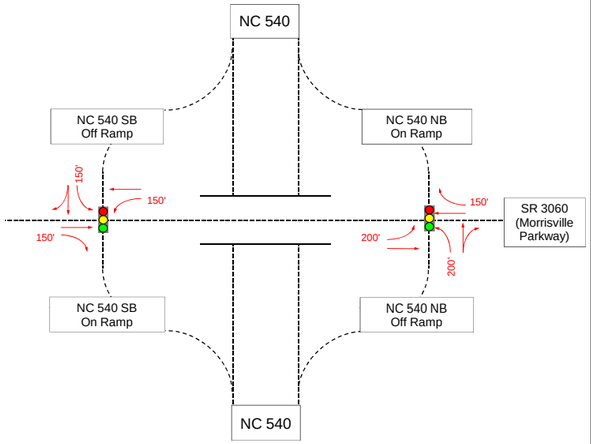


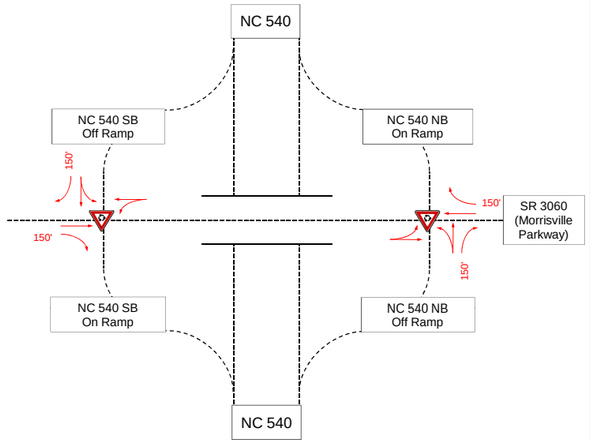
Figure A-6
Design Year (2035) No-Build AM and PM Peak Hour Volumes

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

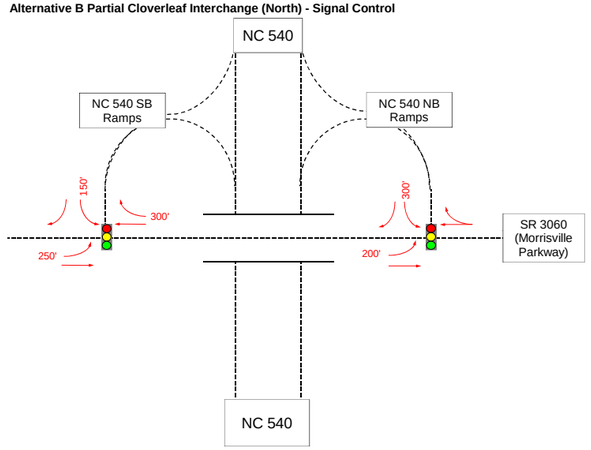
Alternative A Diamond Interchange - Signal Control



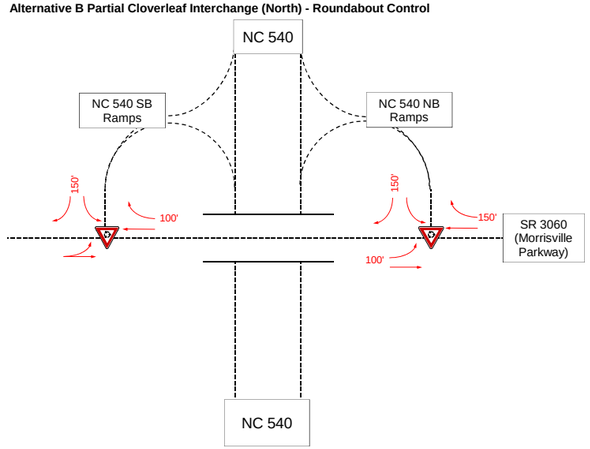
Alternative A Diamond Interchange - Roundabout Control



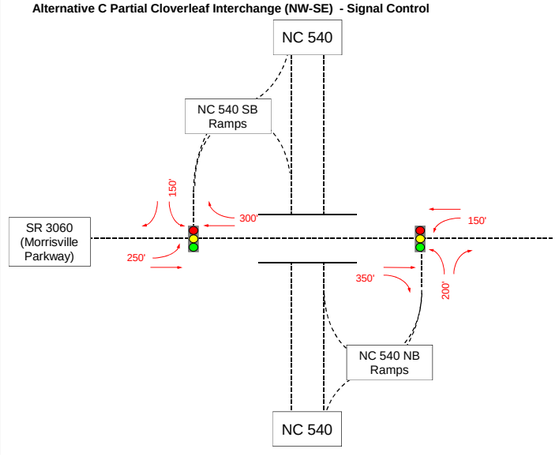
Alternative B Partial Cloverleaf Interchange (North) - Signal Control



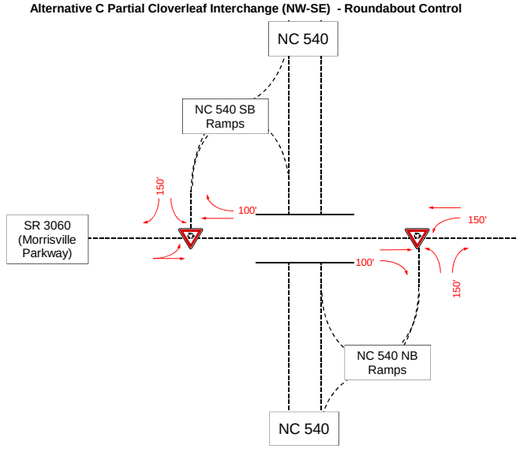
Alternative B Partial Cloverleaf Interchange (North) - Roundabout Control



Alternative C Partial Cloverleaf Interchange (NW-SE) - Signal Control



Alternative C Partial Cloverleaf Interchange (NW-SE) - Roundabout Control



N

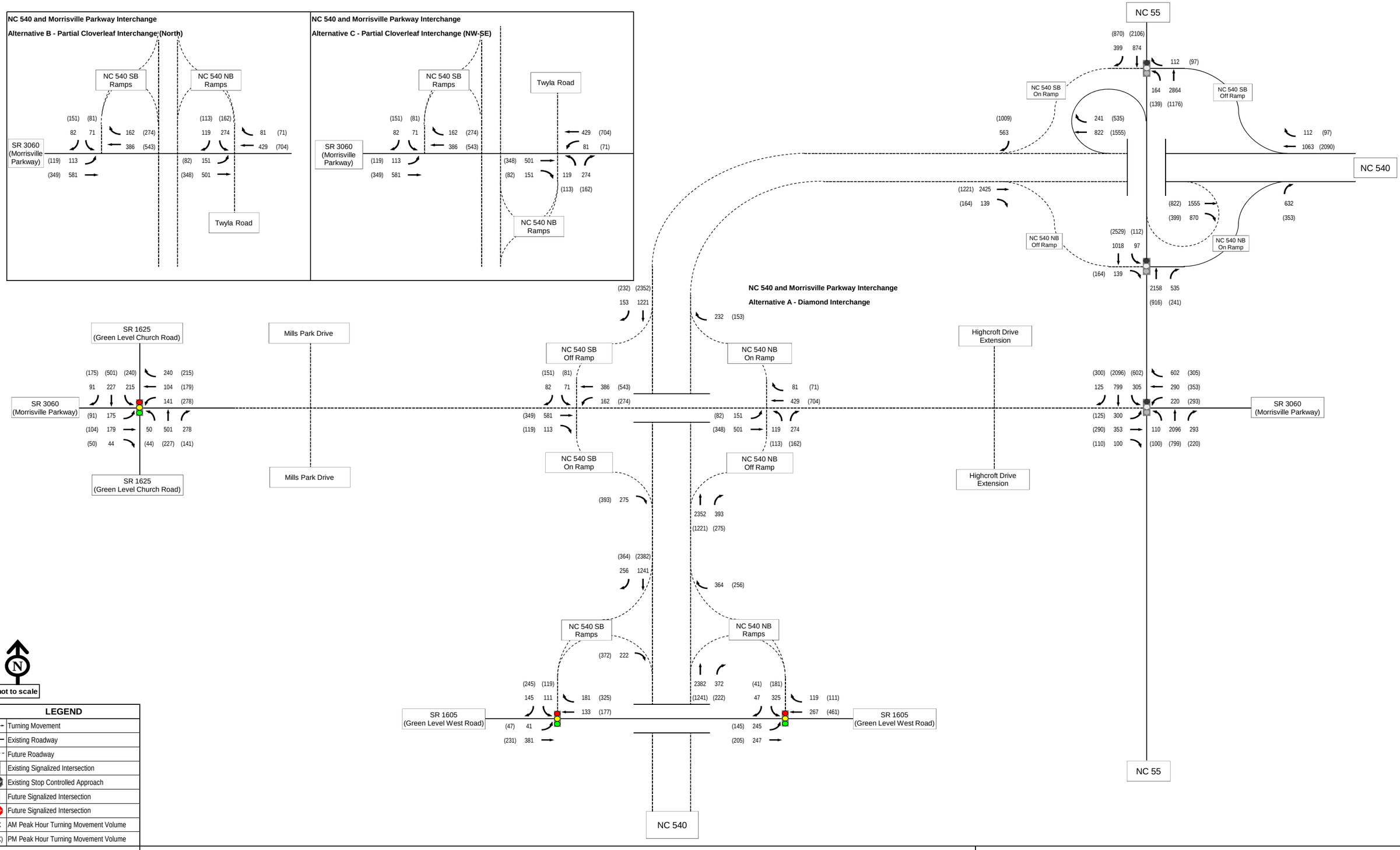
not to scale

LEGEND	
→	Existing Lane Configuration
→	Future Lane Configuration
—	Existing Roadway
- - -	Future Roadway
	Future Signalized Intersection
	Future Roundabout Controlled Intersection

MARTIN ALEXIOU BRYSON

Figure A-7
Opening Year (2015) Build Lane Geometrics and Traffic Control

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

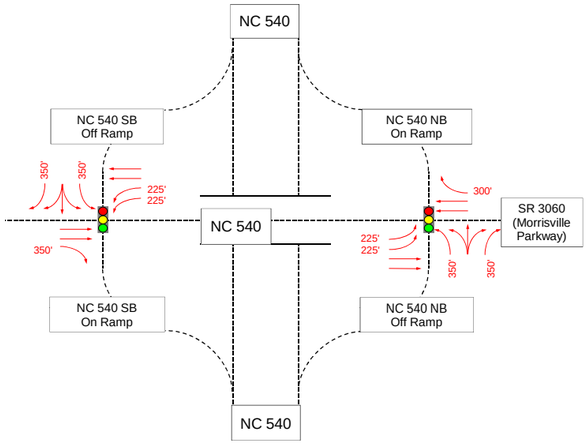


MARTIN ALEXIOU BRYSON

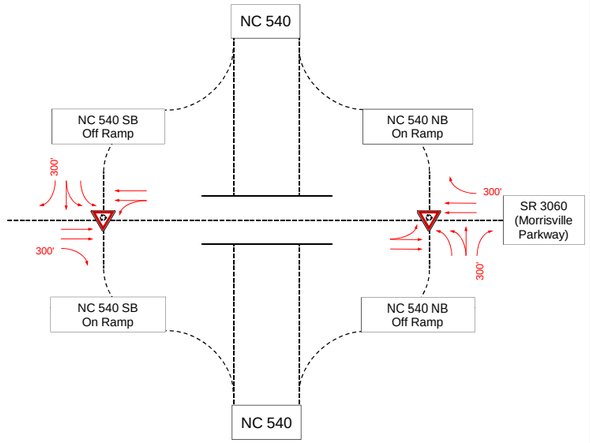
Figure A-8
Opening Year (2015) Build AM and PM Peak Hour Volumes

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

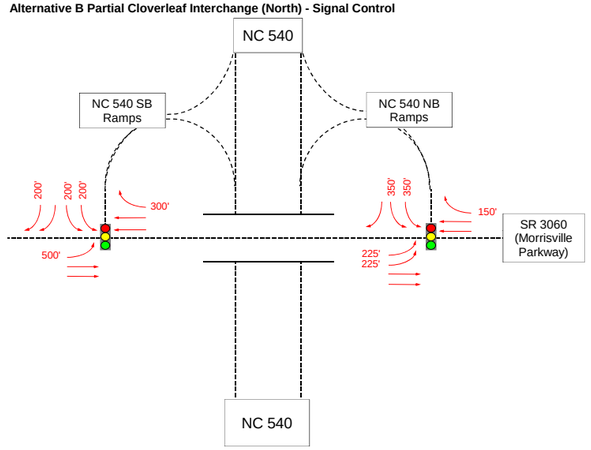
Alternative A Diamond Interchange - Signal Control



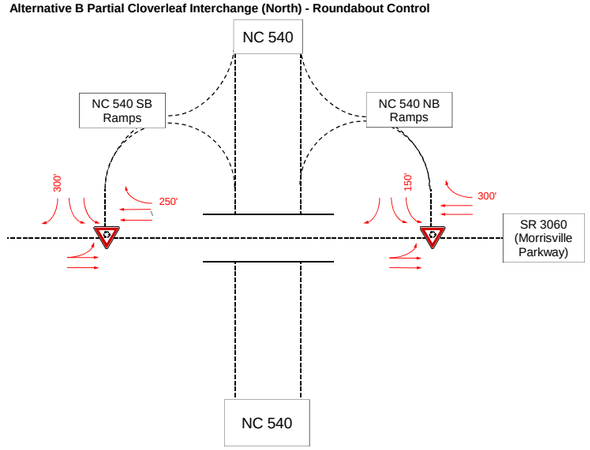
Alternative A Diamond Interchange - Roundabout Control



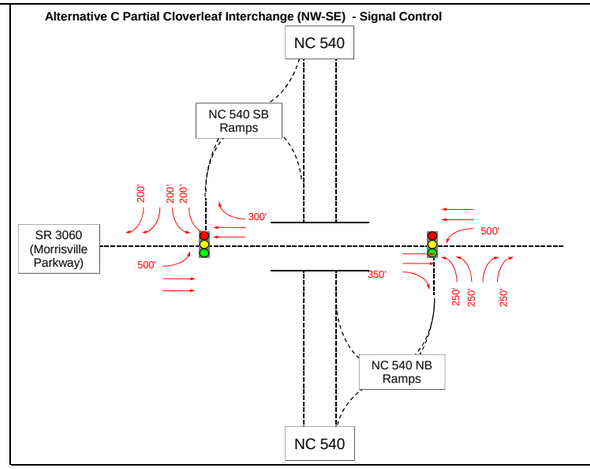
Alternative B Partial Cloverleaf Interchange (North) - Signal Control



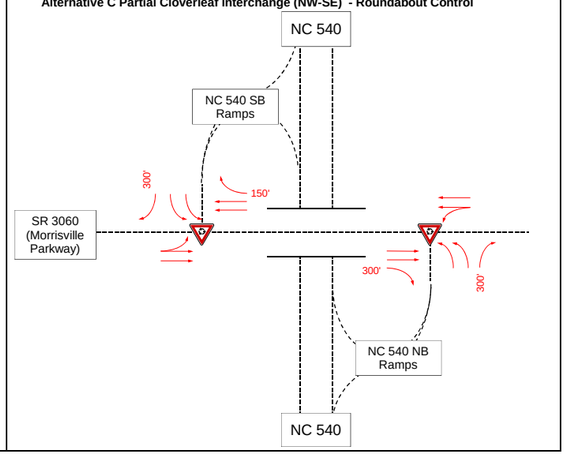
Alternative B Partial Cloverleaf Interchange (North) - Roundabout Control



Alternative C Partial Cloverleaf Interchange (NW-SE) - Signal Control



Alternative C Partial Cloverleaf Interchange (NW-SE) - Roundabout Control



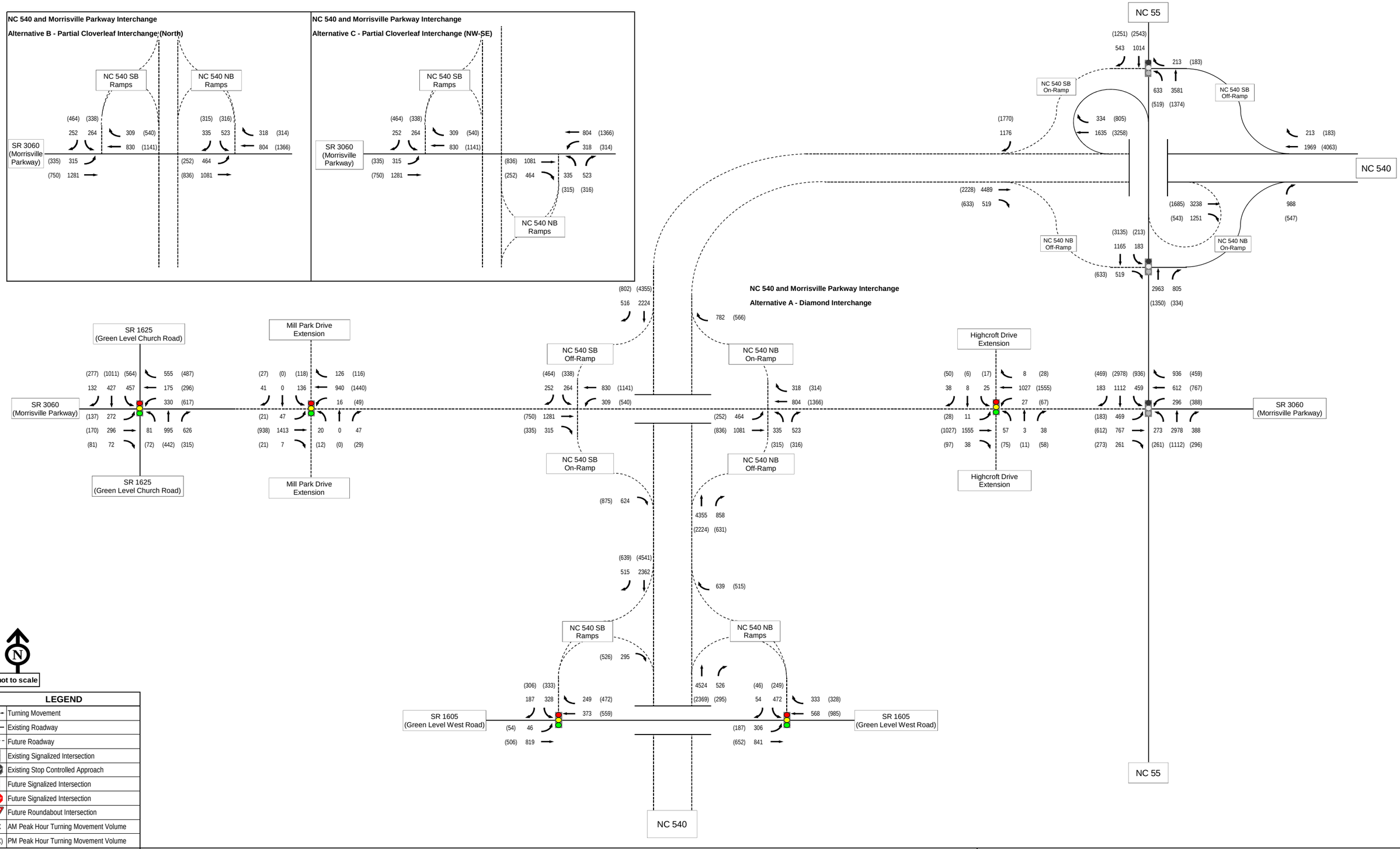
not to scale

LEGEND	
→	Existing Lane Configuration
→	Future Lane Configuration
—	Existing Roadway
- - -	Future Roadway
	Future Signalized Intersection
	Future Roundabout Controlled Intersection

MARTIN ALEXIOU BRYSON

Figure A-9
Design Year (2035) Build Lane Geometrics and Traffic Control

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC



MARTIN ALEXIOU BRYSON

Figure A-10
Design Year (2035) Build AM and PM Peak Hour Volumes

Morrisville Parkway Extension and NC 540 Interchange Capacity Analysis
Wake County, NC

Appendix B

Agency Coordination

US Army Corps of Engineers

Permit Correspondence

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

January 30, 2009

Regulatory Division

Action ID SAW-2008-00373

Town of Cary, Engineering Department
ATTN: Mr. Eric Simpson
Post Office Box 8005
Cary, North Carolina 27512-8005

Dear Mr. Simpson:

Enclosed is a Department of the Army permit to fill material into 0.72 acres of jurisdictional forested wetlands, and 3,412 linear feet of perennial stream channel exhibiting important aquatic functions associated with the construction of Morrisville Parkway, Phase III. The project location is between North Carolina Highway 55 (NC 55) westward for a distance of approximately 3 miles to a terminus with SR 1625, Green Level to Durham Road at SR 1600, Green Level Church Road near Cary, Wake County, North Carolina.

Any deviation in the authorized work will likely require modification of this permit. If a change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notifies you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant conditions require that:

a. You must complete construction before December 31, 2029.

b. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

You must notify this office in advance as to when you intend to commence and complete work.

You should address all questions regarding this authorization to Monte Matthews in the Raleigh Regulatory Field Office at (919) 554-4884, extension 30.

Sincerely,

Jefferson M. Ryscavage
Colonel, U.S. Army
District Commander

Enclosures

Copy Furnished (with enclosures):

Chief, Source Data Unit
NOAA/National Ocean Service
ATTN: Sharon Tear N/CS261
1315 East-West Hwy., Rm 7316
Silver Spring, Maryland 20910-3282

Copy Furnished (with special conditions and plans):

Mr. Ronald J. Mikulak, Chief
Wetlands Regulatory Section
61 Forsyth Street
Atlanta, Georgia 30303

Mr. Pete Benjamin
U.S. Fish and Wildlife Service
Fish and Wildlife Enhancement
Post Office Box 33726
Raleigh, North Carolina 27636-3726

Mr. Ron Sechler
National Marine Fisheries Service
Pivers Island
Beaufort, North Carolina 28516

Mr. Doug Huggett
Division of Coastal Management
N.C. Department of Environment
and Natural Resources
400 Commerce Avenue
Morehead City, North Carolina 28557

Mr. David Rackley
National Marine Fisheries Service
219 Fort Johnson Road
Charleston, South Carolina 29412-9110

DEPARTMENT OF THE ARMY PERMIT

Permittee: TOWN OF CARY

Permit No: SAW-200800373

Issuing Office: USAED, WILMINGTON

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of the office acting under the authority of the commanding officer.

You are authorized to perform work in the accordance with the terms and conditions specified below.

Project Description: Portions of Morrisville Parkway have previously been constructed. This project is to extend the existing portion of roadway, currently terminating at NC 55, to Green Level to Durham Road at Green Level Church Road. The ultimate design would be similar to the existing sections of Morrisville Parkway which includes a 105-foot wide, 4-lane median divided roadway, including 5-foot wide sidewalks and 5-foot wide utility strips to be situated on both sides of the roadway. Included is an interchange with the future Western Wake Freeway (I-540). Total permanent impacts from this project are 0.72-acres of jurisdictional forested wetlands, and 3,412 linear feet of perennial stream channel exhibiting important aquatic functions. The Town of Cary is utilizing this long-range planning approach for a fair evaluation on the corridor and expected impacts of this roadway, rather than waiting and allowing future development to limit the overall flexibility required for impact minimization and/or avoidance. Stage 1A would be constructed using the final designs depicted within this permit. The other 2 phases would be permitted on the impacts stated above, realizing that these are worse-case scenarios. Final designs for each stage would be provided to the Corps for a permit modification prior to construction. At the time of permit modification, additional minimization or avoidance would be evaluated for items such as bridging, fill slopes, etc. It is expected that impact amounts would go down during the time of permit modification. To mitigate for all unavoidable impacts to jurisdictional features for stage 1A, the applicant has proposed payment into the North Carolina Ecosystem Enhancement Program (NCEEP) in the amount to restore 0.17 acres of riparian wetlands in the Cape Fear River Basin, Cataloging Unit 03030002 and 731 linear feet of warm water stream in the Cape Fear River Basin, Cataloging Unit 03030004. In addition, the applicant will preserve 3,565 linear feet of on-site stream channel and 1.2 acres of on-site wetlands via the Corps' standard Declaration of Restrictions language. As the plans for phases 1B and 2 are finalized, permit modifications showing the finalized plans must be submitted to the Corps for review and evaluation. Compensatory mitigation for impacts under phases 1B and 2 will be addressed at the time of each respective permit modification and completed prior to impacts to jurisdictional features.

Project Location: The project location is between North Carolina Highway 55 (NC 55) westward for a distance of approximately 3 miles to a terminus with SR 1625, Green Level to Durham Road at SR 1600, Green Level Church Road near Cary, Wake County, North Carolina. Coordinates, in decimal degrees, for the end points of the construction areas are 35.813720° N, 78.872747° W, and 35.802659 ° N, 78.909490 ° W. The project site contains several wetlands and unnamed streams channels which drain to Panther Creek in the Haw watershed of the Cape Fear River Basin (8-Digit Cataloging Unit of 03030002).

Permit Conditions:

General Conditions:

1. The time Limit for completing the work authorized ends on December 31, 2029 If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Conditions 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

*SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S. C. 403).

(X) Section 404 of the clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United states in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was mad in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (see 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measure by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

 *U.S. GOVERNMENT PRINTING OFFICE: 1986 – 717-425

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE) **TOWN OF CARY** *(DATE)* 1/26/09

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

(DISTRICT Engineer) **JEFFERSON M. RYSCAVAGE, COLONEL** *(DATE)* 1/30/09

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(Transferee) (Date)

Special Conditions - Action ID 200800373, Town of Cary

Work Limits

1. All work authorized by this permit must be performed in strict compliance with the attached plans, which are a part of this permit. Any modification to these plans must be approved by the US Army Corps of Engineers (USACE) prior to implementation.

2. Except as authorized by this permit or any USACE approved modification to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands. This permit does not authorize temporary placement or double handling of excavated or fill material within waters or wetlands outside the permitted area. This prohibition applies to all borrow and fill activities connected with this project.

3. Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters or wetlands.

4. The North Carolina Division of Water Quality (DWQ) permit/certification number 3737 was issued for this project on April 9, 2008. Special conditions were issued associated with this water quality permit/certification and a copy of these conditions is attached as Exhibit A. These referenced conditions are hereby incorporated as special conditions of this permit.

5. The permittee shall make payment to the North Carolina Ecosystem Enhancement Program (NC EEP) in the amount determined by the NC EEP, sufficient to perform the amount necessary to restore 0.17 acre of riparian wetlands in the Cape Fear River Basin, Cataloging Unit 03030002 and 731 linear feet of warm water stream in the Cape Fear River Basin, Cataloging Unit 03030004.

Construction within jurisdictional areas on the property for Stage 1A shall begin only after the permittee has made full payment to the NC EEP and provided a copy of the payment documentation to the Corps, and the NC EEP has provided written confirmation to the Corps that it agrees to accept responsibility for the mitigation work required, in compliance with the MOU between the North Carolina Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District, dated November 4, 1998.

In addition, the Permittee shall execute and cause to be recorded in the Wake County Register of Deeds a Conservation Declaration, the form of which was transmitted to USACE in a December 19, 2008, email from Mr. Eric Simpson, which shall preserve in perpetuity 3,565 linear feet of stream and 1.2 acres of wetland described on the map attached to the email as "WETLANDS_PRESERVE". The December 19, 2008, email states that the Permittee will use the Corps approved language for Declaration of Restrictions verbatim. The permittee shall enforce the terms of the conservation declaration and shall take no action on the property described in the declaration inconsistent with the terms thereof. The permittee shall record the conservation declaration no later than May 1, 2009. The permittee shall provide a copy of the recorded declaration to the Corps of Engineers within 30 days of recording.

6. As the plans for phases 1B and 2 are finalized, permit modifications showing the finalized plans must be submitted to the Corps for review and evaluation. Compensatory mitigation for impacts under phases 1B and 2 will be addressed at the time of each respective permit modification and completed prior to impacts to jurisdictional features.

Culverts

7. Measures will be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert should not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening should be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gage data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

Culverts greater than 48 inches in diameter will be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter or less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain the existing channel slope. The bottom of the culvert must be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Destabilizing the channel and head cutting upstream should be considered in the placement of the culvert. A waiver from the depth specifications in this condition may be requested in writing. The waiver will be issued if it can be demonstrated that the proposal would result in the least impacts to the aquatic environment. Culverts placed in wetlands do not have to be buried.

Special Conditions - Action ID 200800373, Town of Cary

Related Laws

8. All mechanized equipment will be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the permittee shall immediately report it to the N.C. Division of Water Quality at (919) 733-5083, Ext. 526 or (800) 662-7956 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act will be followed.

Project Maintenance

9. The permittee shall advise the Corps in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit. In addition, a pre-construction meeting shall take place prior to beginning the construction activities. This meeting shall be comprised of the applicant, the contractors, any sub-contractors and their equipment operators working within jurisdictional areas. Please contact the Corps of Engineers Project Manager at least 2 weeks prior to the commencement of construction to schedule this meeting.

10. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source and will be clean and free of any pollutants except in trace quantities. Metal products, organic materials (including debris from land clearing activities), or unsightly debris will not be used.

11. The permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all conditions, shall be available at the project site during construction and maintenance of this project.

12. The permittee shall employ all sedimentation and erosion control measures necessary to prevent an increase in sedimentation or turbidity within waters and wetlands outside the permit area. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project must remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A Article 4).

Special Conditions - Action ID 200800373, Town of Cary

13. The permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

Enforcement

14. Violations of these conditions or violations of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act must be reported in writing to the Wilmington District U.S. Army Corps of Engineers within 24 hours of the permittee's discovery of the violation.

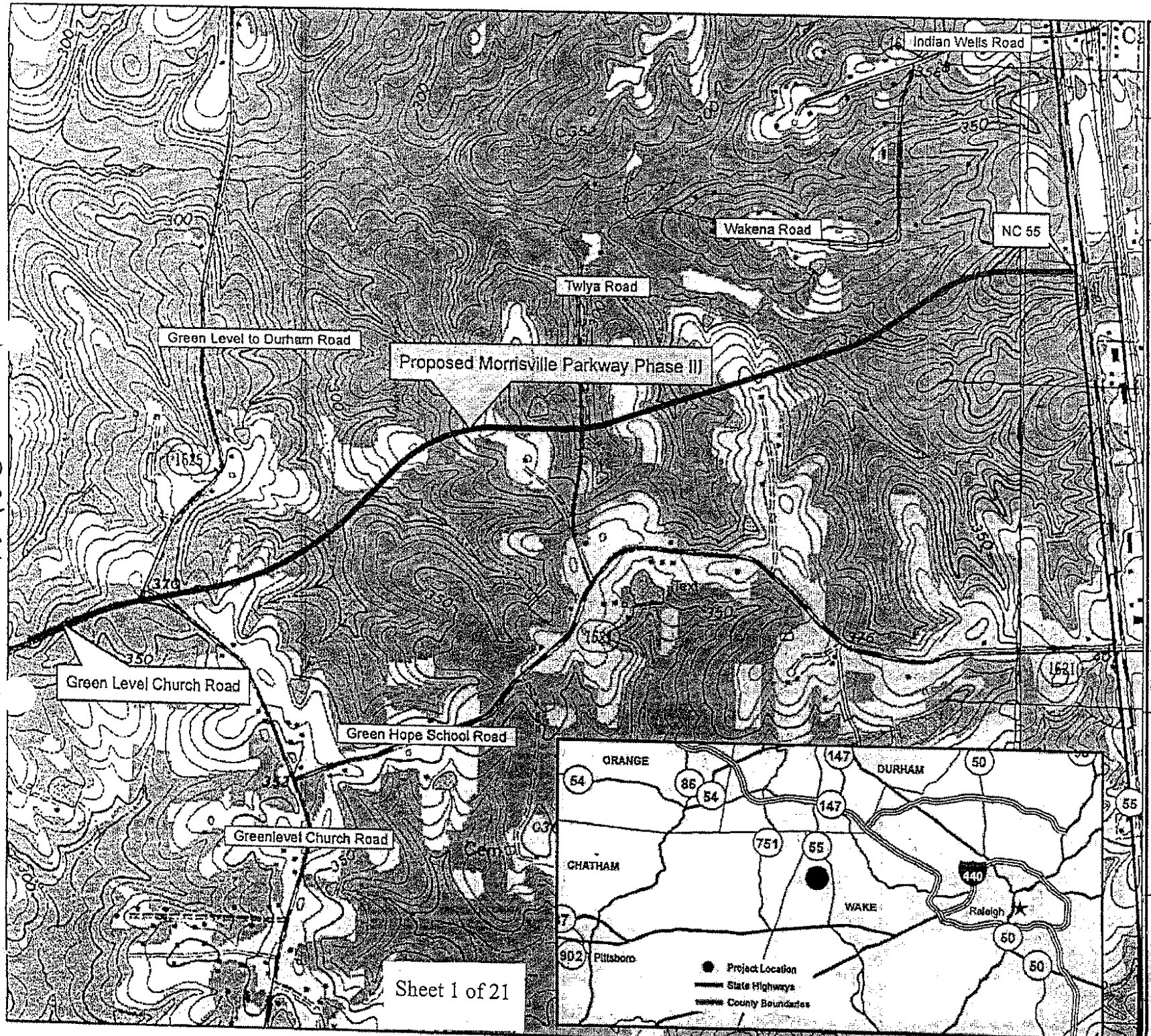


Figure 1:
Vicinity Map

Morrisville Parkway
Extension Phase III

TOC Project No.
ST-1123

Legend

Proposed Centerline

N

0 500 1,000
Feet

URS
Morrisville, NC

Sources: Wake County, NC; ESRI, Inc; Town of Cary, NC; USGS 7.5 minute Cary, NC and Green Level, NC topographic quads.

- PLANS -

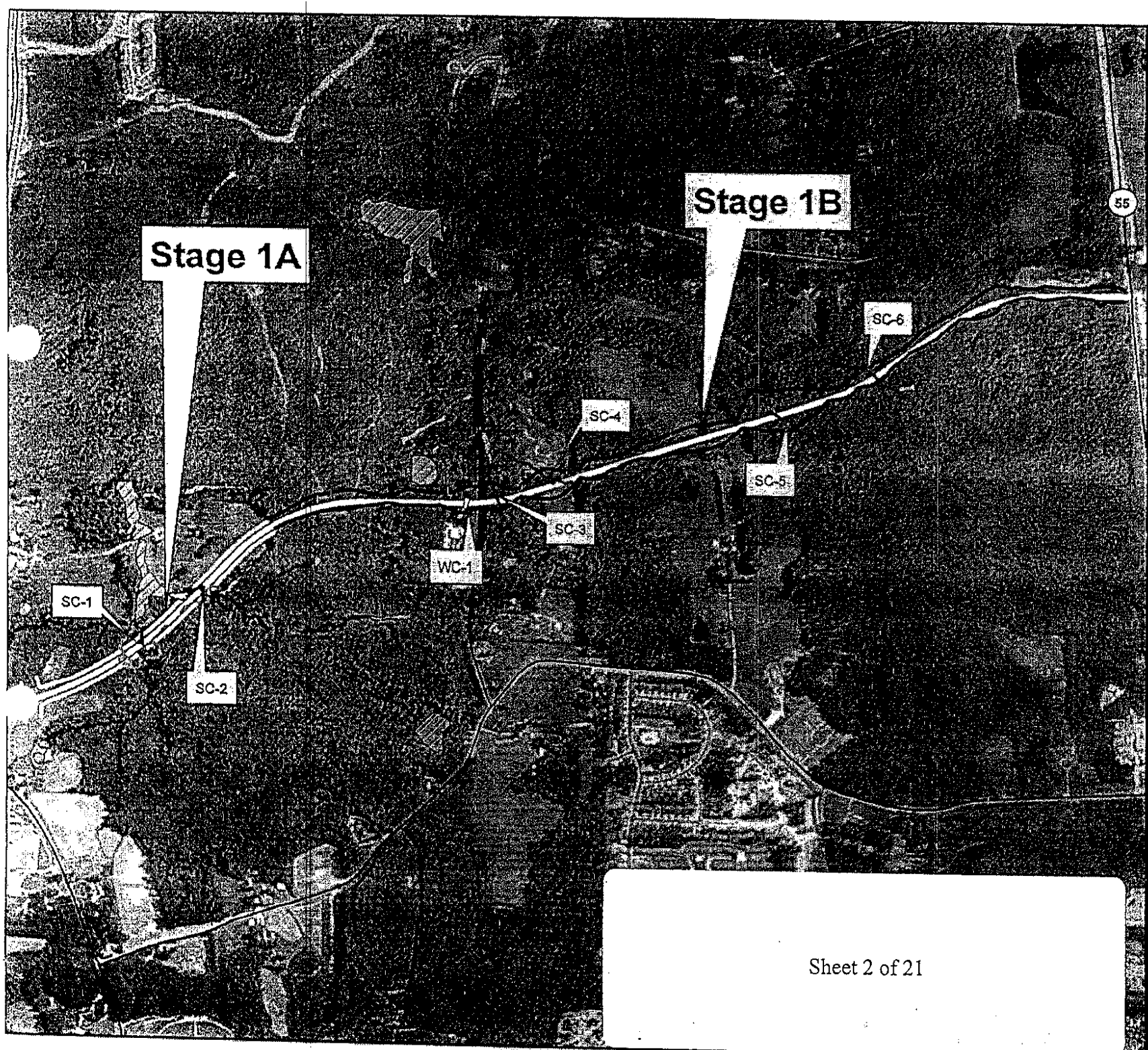


Figure 3:
Stage 1 Impacts

Morrisville Parkway
Extension Phase III

TOC Project No.
ST-1123

Legend
- Proposed Centerline
- Stage 1A Right-of-Way
- Stage 1A Disturbance Limits
- Stage 1B Slope Stake Limits
- Stream Impacts
- Wetland Impacts
- Streams
- Wetlands

SC-# Stream Crossing

WC-# Wetland Crossing

N

0 1,000 Feet

URS
Morrisville, NC

Sheet 2 of 21

Sources: Wake County, NC; ESRI, Inc; Town of Cary, NC; and URS Corp.

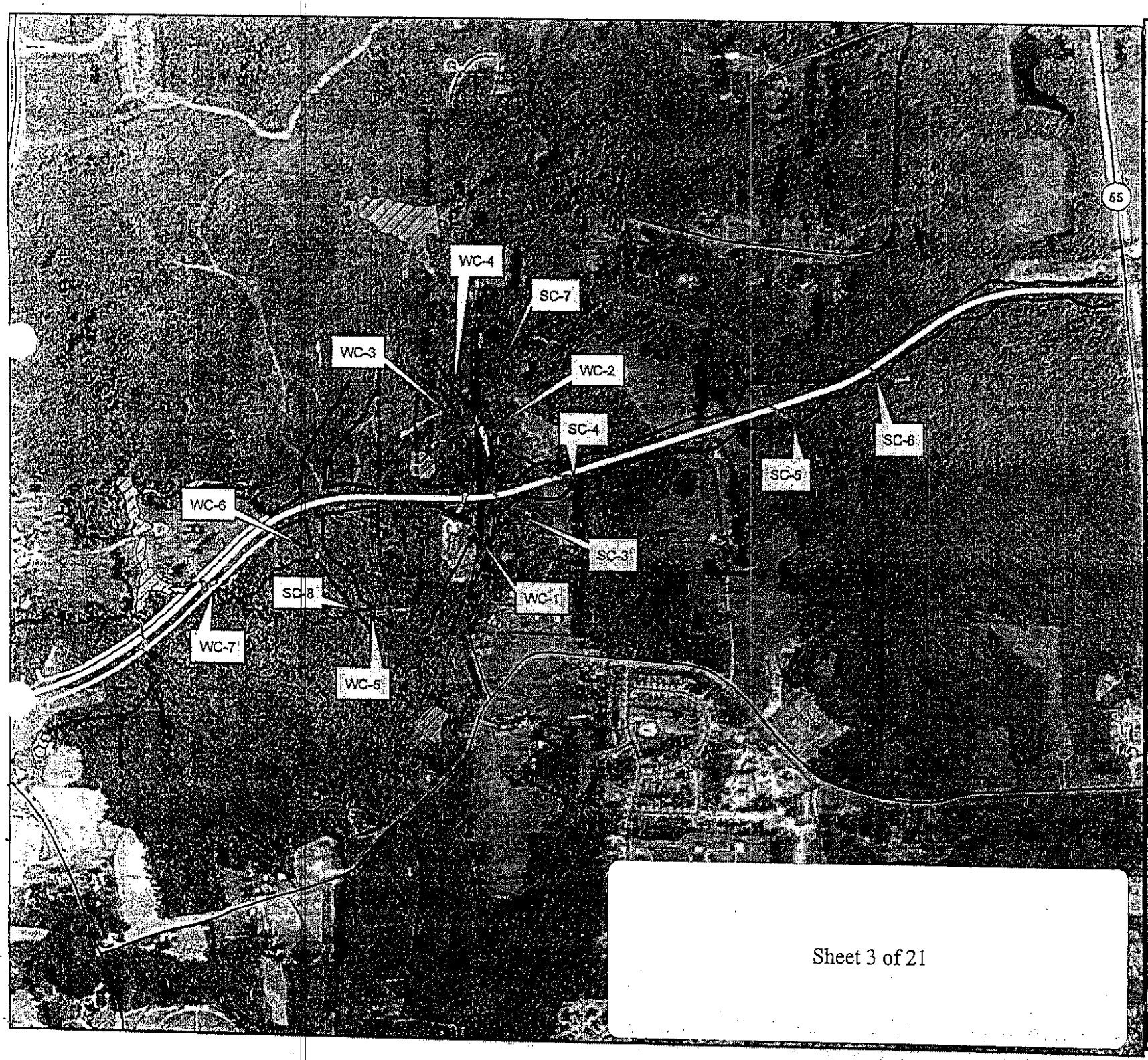


Figure 4:
Stage 2 Impacts

Morrisville Parkway Extension Phase III

TOC Project No. ST-1123

Legend

- Proposed Centerline
- Stage 2 - Greystone R/W Limits
- Stage 2 Slope Stake Limits
- Future I-540 Disturbance Limits
- Stage 2 Stream Impacts
- Stage 2 Wetlands Impacts
- Stage 1 Stream Impacts
- Stage 1 Wetland Impacts
- Streams
- Wetlands

SC-# Stream Crossing

WC-# Wetland Crossing

N

0 1,000 Feet

URS
Morrisville, NC

Sheet 3 of 21

Sources: Wake County, NC; ESRI, Inc; Town of Cary, NC; and URS Corp.

STAGE 1A - (GREYSTONE SUBDIVISION AREA) WETLAND AND STREAM IMPACTS

Figure No.	Impact No.**	Permanent Impact Type	linear feet**	square feet**
SC-1	1A	Perennial Stream	365	1,135
	1B	Section 404 Forested Wetland	N/A	91
	1C	Section 404 Forested Wetland	N/A	153
SC-2	2A	Perennial Stream	366	1,274
	2B	Section 404 Forested Wetland		2,617
	2C	Section 404 Forested Wetland		4,538
		Total	731	9,808

** Based on final design (see Appendix B for plan drawings).

STAGE 1B – 2-LANE ROADWAY: NC-55 TO GREYSTONE SUBDIVISON WETLAND AND STREAM IMPACTS

Figure No.	Permanent Impact Type	linear feet*	square feet*
SC-3	Perennial Stream	241	2,410
SC-4	Perennial Stream	361	3,610
SC-5	Perennial Stream	495	4,950
SC-6	Perennial Stream	200	2,000
WC-1	Section 404 Forested Wetland	N/A	4,356
	Total	**1297**	**17,326**

* Estimate based on preliminary design.

STAGE 2 – 4-LANE ROADWAY: NC-55 TO GREEN LEVEL CHURCH ROAD WETLAND AND STREAM IMPACTS

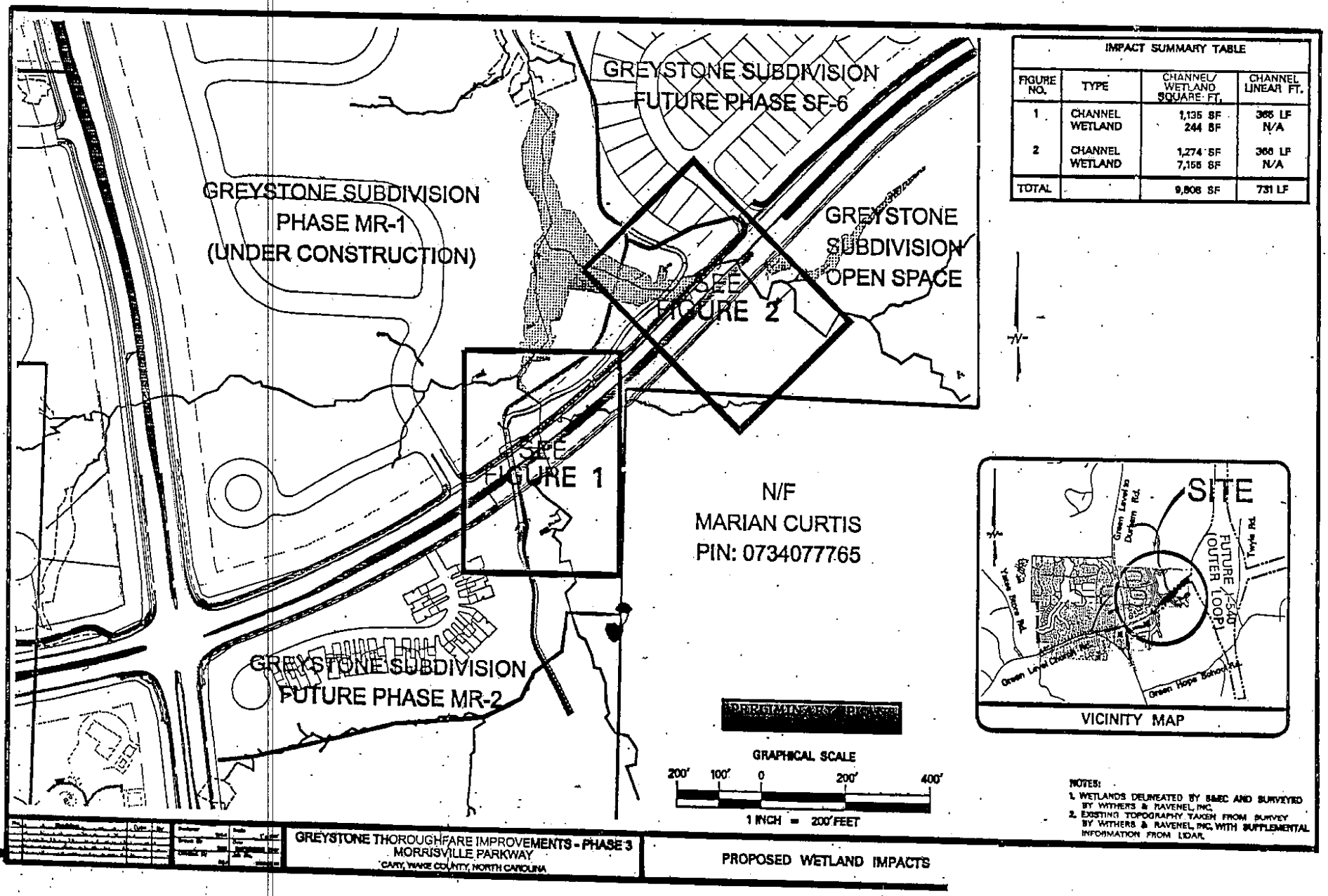
Figure No.	Permanent Impact Type	linear feet***	square feet***
SC-1	Perennial Stream	0	0
SC-2	Perennial Stream	0	0
SC-3	Perennial Stream	546	5,460
SC-4	Perennial Stream	84	840
SC-5	Perennial Stream	50	500
SC-6	Perennial Stream	60	600
SC-7	Perennial Stream	508	508
SC-8	Perennial Stream	136	136
WC-1	Section 404 Forested Wetland	N/A	2,178
WC-2	Section 404 Forested Wetland	N/A	9,583
WC-3	Section 404 Forested Wetland	N/A	1,307
WC-4	Section 404 Forested Wetland	N/A	871
WC-5	Section 404 Forested Wetland	N/A	871
WC-6	Section 404 Forested Wetland	N/A	2,614
WC-7	Section 404 Forested Wetland	N/A	2,000
	Total	1,384	27,468

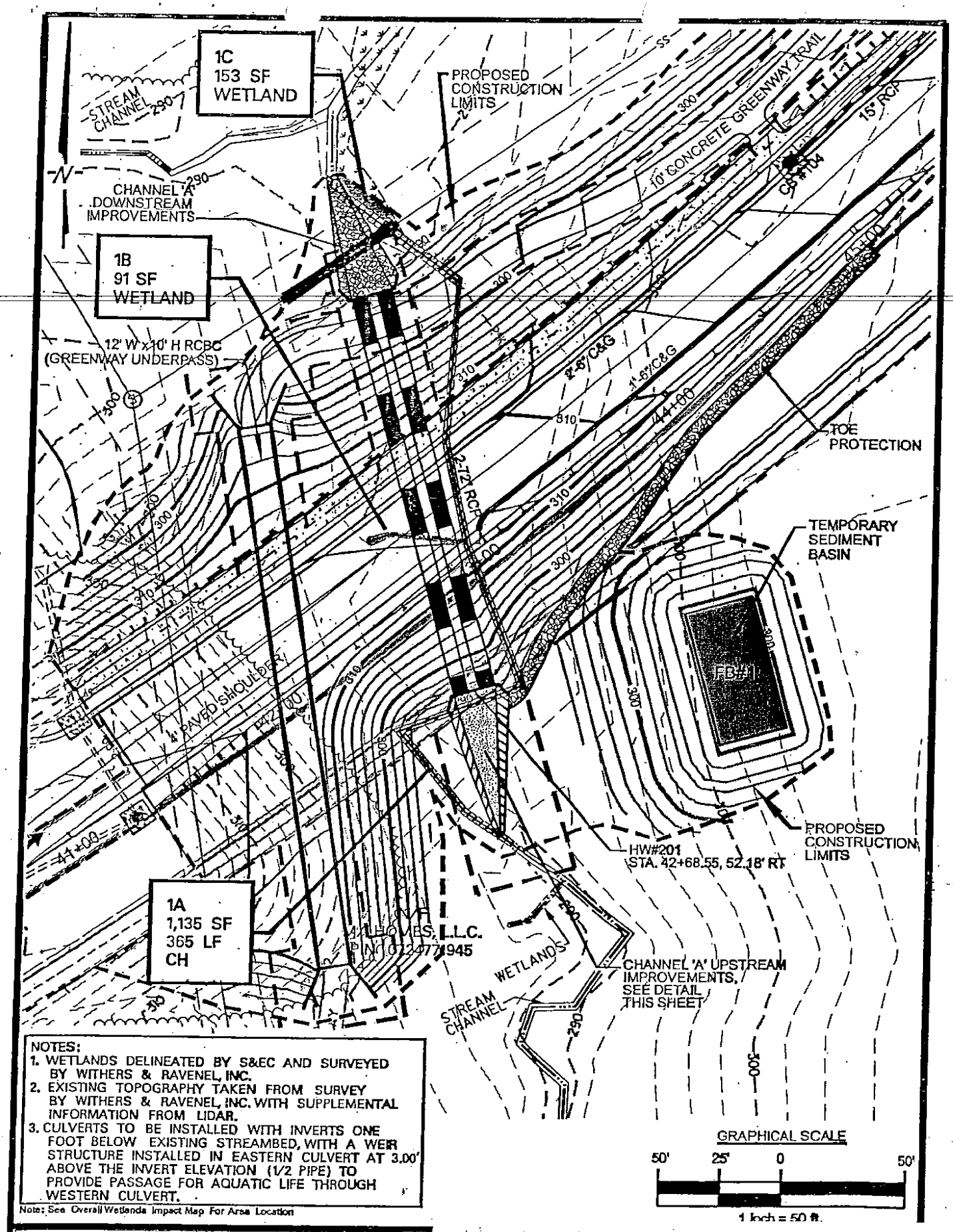
*** Estimate based on preliminary design for the Stage 2 additional impacts.

SUMMARY OF OVERALL WETLAND AND STREAM IMPACTS (ALL STAGES)

		Project Stage			
		Stage 1A	Stage 1B	Stage 2	
		Greystone Subdivision	2-Lane Road (NC 55 to Greystone Subdivision)*	4-Lane Road (NC 55 to Green Level Chruch Road)*	**Total*.**
Permanent Impacts	Section 404 Forested Wetlands (acre)	0.17	0.10	0.45	**0.72**
	Perennial Streams (linear feet)	731	1,297	1,384	**3,412**
Temporary Impacts	Section 404 Forested Wetlands (acre)	0.00	To be determined (TBD)	TBD	**TBD**
	Perennial Streams (linear feet)	0	TBD	TBD	**TBD**

* Estimate based on preliminary design.


GREYSTONE SUBDIVISION
FUTURE PHASE SF-6
GREYSTONE SUBDIVISION
PHASE MR-1
(UNDER CONSTRUCTION)
GREYSTONE
SUBDIVISION
OPEN SPACE
SEE
FIGURE 2
SEE
FIGURE 1
N/F
MARIAN CURTIS
PIN: 0734077765
GREYSTONE SUBDIVISION
FUTURE PHASE MR-2
IMPACT SUMMARY TABLE
FIGURE NO.
TYPE
CHANNEL/ WETLAND SQUARE FT.
CHANNEL LINEAR FT.
1
CHANNEL
WETLAND
1,135 SF
244 SF
365 LF
N/A
2
CHANNEL
WETLAND
1,274 SF
7,155 SF
366 LF
N/A
TOTAL
9,808 SF
731 LF
SITE
FUTURE I-540 (OUTER LOOP)
VICINITY MAP
GRAPHICAL SCALE
200' 100' 0 200' 400'
1 INCH = 200' FEET
NOTES:
1. WETLANDS DELINEATED BY S&EC AND SURVEYED BY WITHERS & RAVENEL, INC.
2. EXISTING TOPOGRAPHY TAKEN FROM SURVEY BY WITHERS & RAVENEL, INC. WITH SUPPLEMENTAL INFORMATION FROM LIDAR.
GREYSTONE THOROUGHFARE IMPROVEMENTS - PHASE 3
MORRISVILLE PARKWAY
CARY, WAKE COUNTY, NORTH CAROLINA
PROPOSED WETLAND IMPACTS



NOTES:
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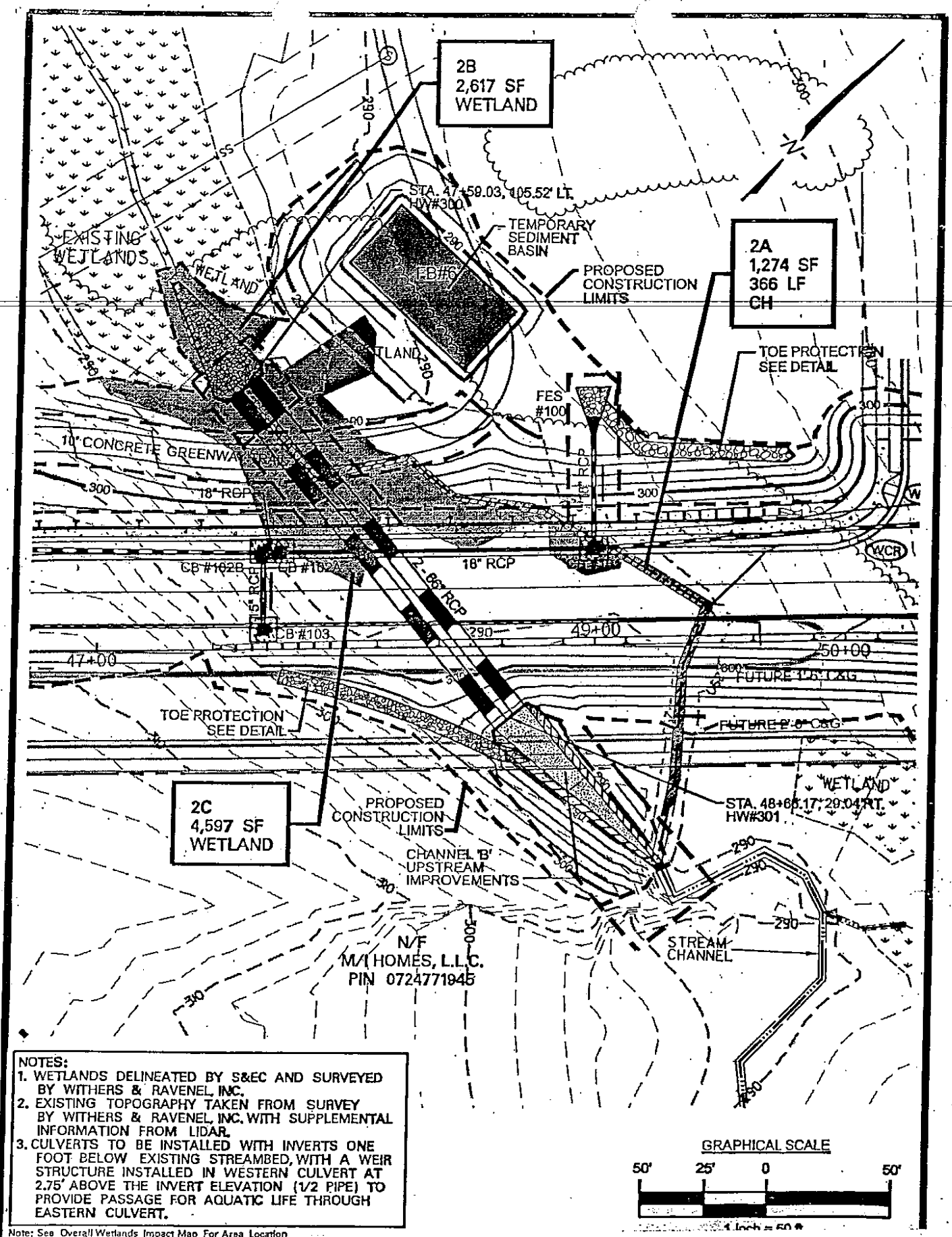
2. EXISTING TOPOGRAPHY TAKEN FROM SURVEY BY WITHERS & RAVENEL, INC. WITH SUPPLEMENTAL INFORMATION FROM LIDAR.
3. CULVERTS TO BE INSTALLED WITH INVERTS ONE FOOT BELOW EXISTING STREAMBED, WITH A WEIR STRUCTURE INSTALLED IN EASTERN CULVERT AT 3.00' ABOVE THE INVERT ELEVATION (1/2 PIPE) TO PROVIDE PASSAGE FOR AQUATIC LIFE THROUGH WESTERN CULVERT.

Note: See Overall Wetlands Impact Map For Area Location

WITHERS & RAVENEL
ENGINEERS | PLANNERS | SURVEYORS

Stage 1A - Final Design Drawings



NOTES:
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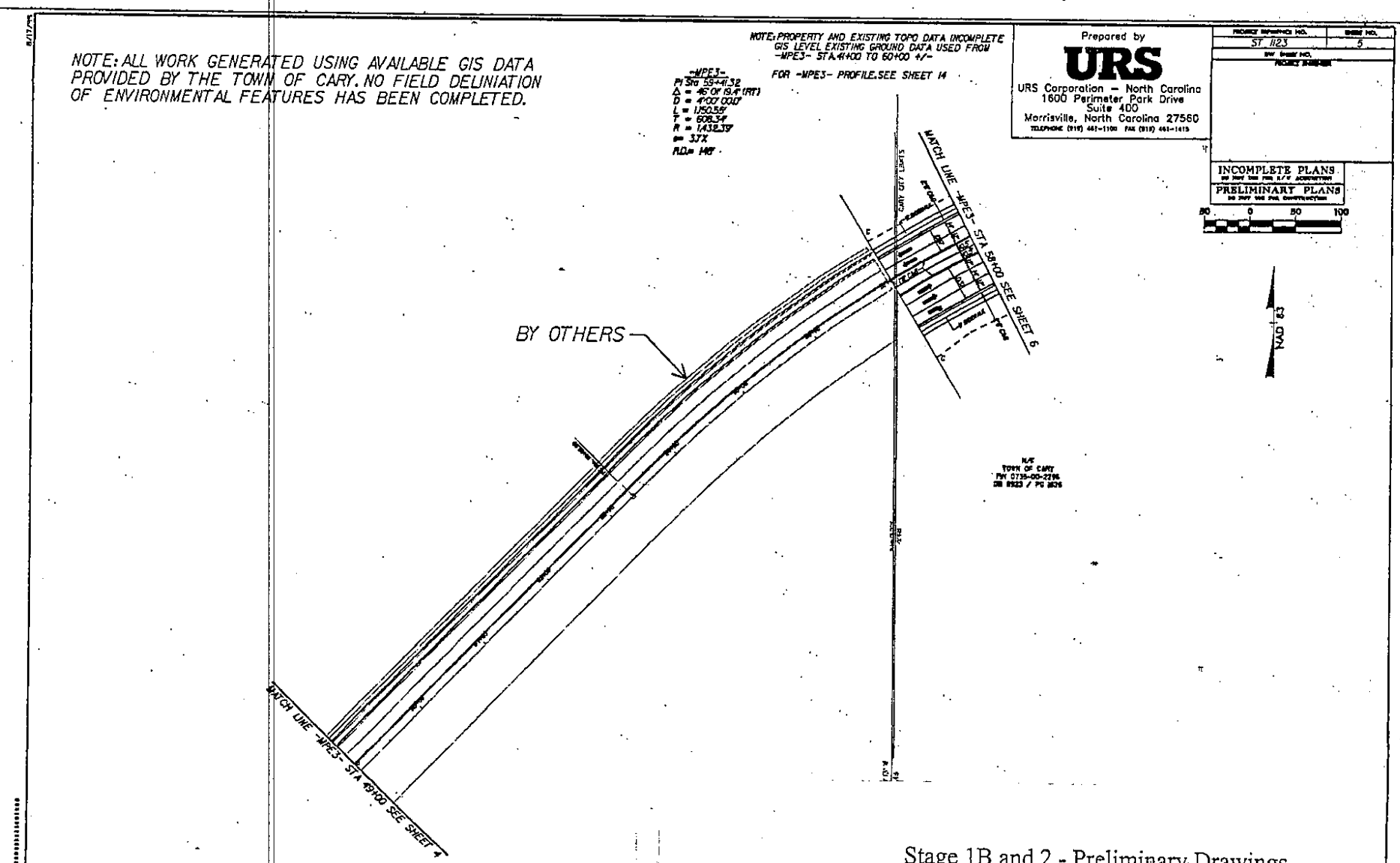
2. EXISTING TOPOGRAPHY TAKEN FROM SURVEY BY WITHERS & RAVENEL, INC. WITH SUPPLEMENTAL INFORMATION FROM LIDAR.
3. CULVERTS TO BE INSTALLED WITH INVERTS ONE FOOT BELOW EXISTING STREAMBED, WITH A WEIR STRUCTURE INSTALLED IN WESTERN CULVERT AT 2.75' ABOVE THE INVERT ELEVATION (1/2 PIPE) TO PROVIDE PASSAGE FOR AQUATIC LIFE THROUGH EASTERN CULVERT.

Note: See Overall Wetlands Impact Map For Area Location

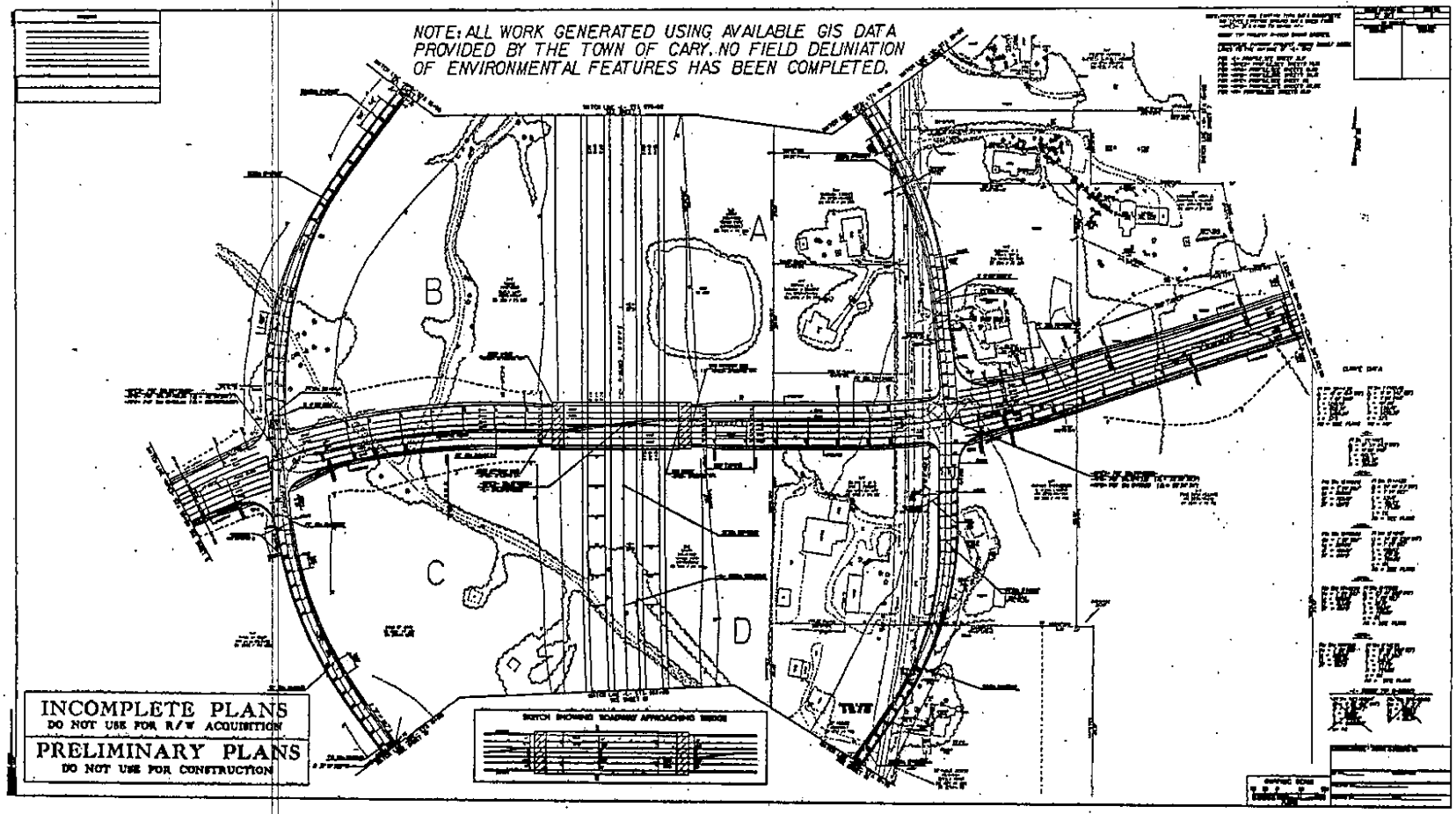
WITHERS & RAVENEL
ENGINEERS | PLANNERS | SURVEYORS

Stage 1A - Final Design Drawings



Stage 1B and 2 - Preliminary Drawings

Sheet 9 of 21



TO PLOT 24"/HALF SIZE\

NOTE: ALL WORK GENERATED USING AVAILABLE GIS DATA PROVIDED BY THE TOWN OF CARY. NO FIELD DELINIATION OF ENVIRONMENTAL FEATURES HAS BEEN COMPLETED.

NOTE: PROPERTY AND EXISTING TOPO DATA INCOMPLETE FOR -WPE3- PROFILE. SEE SHEET 15

Prepared by

URS

URS Corporation – North Carolina
1600 Perimeter Park Drive
Suite 400
Morrisville, North Carolina 27560
TELEPHONE (919) 461-1100 FAX (919) 461-1415

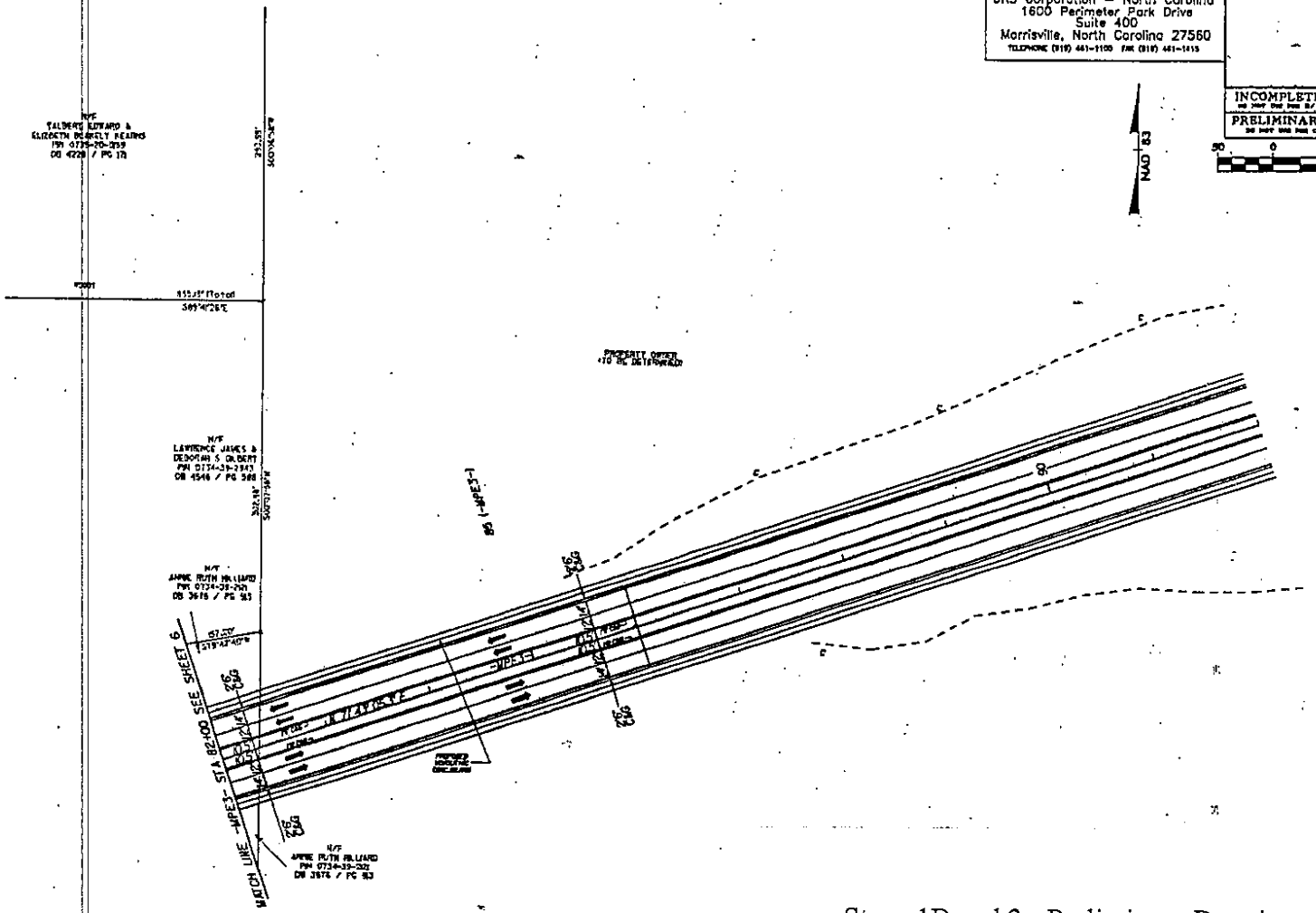
PROJECT REFERENCE NO. ST 1123 | SHEET NO. 7

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

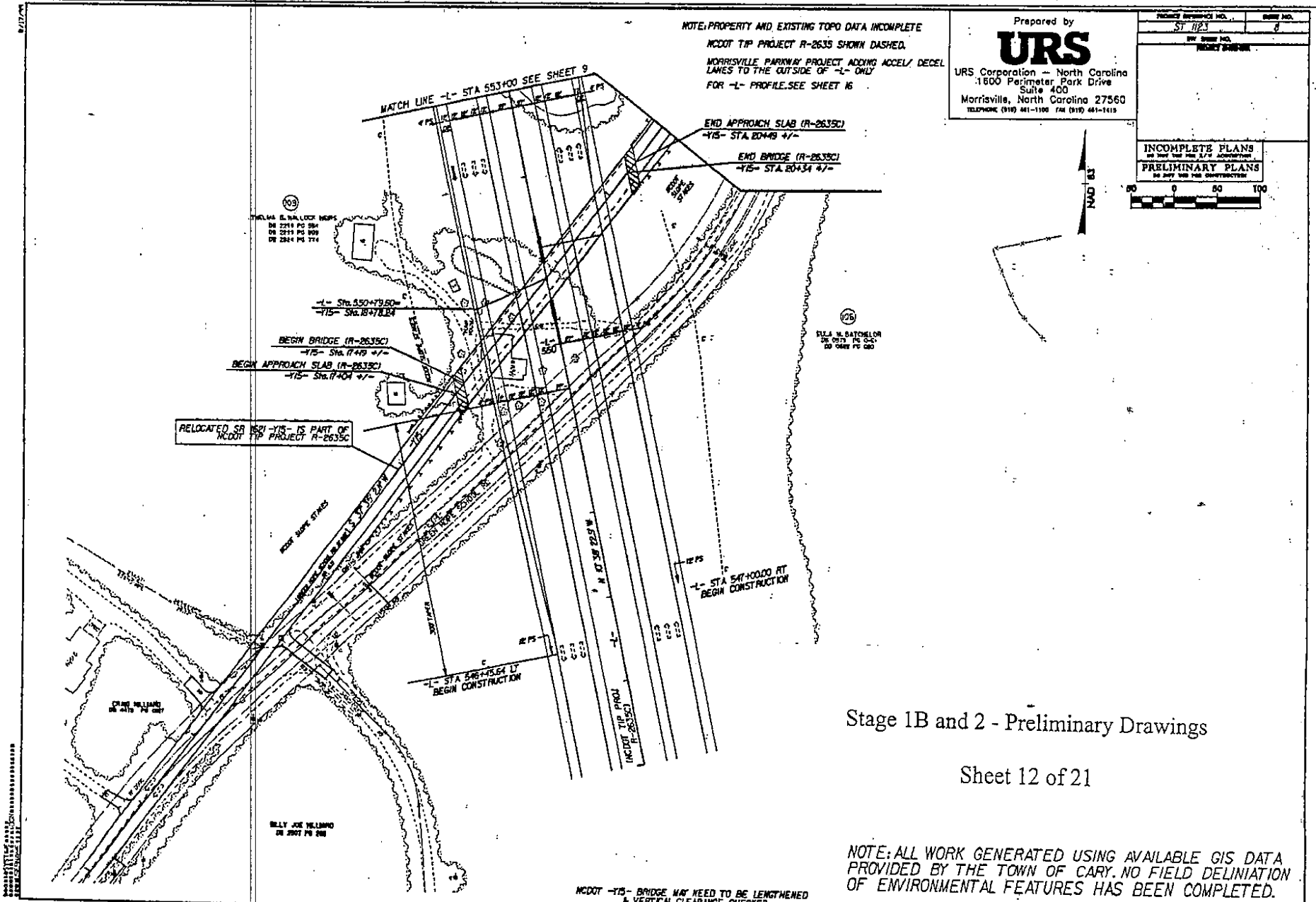
50 0 50 100

NAD 83



Stage 1B and 2 - Preliminary Drawings

Sheet 11 of 21



Stage 1B and 2 - Preliminary Drawings

Sheet 12 of 21

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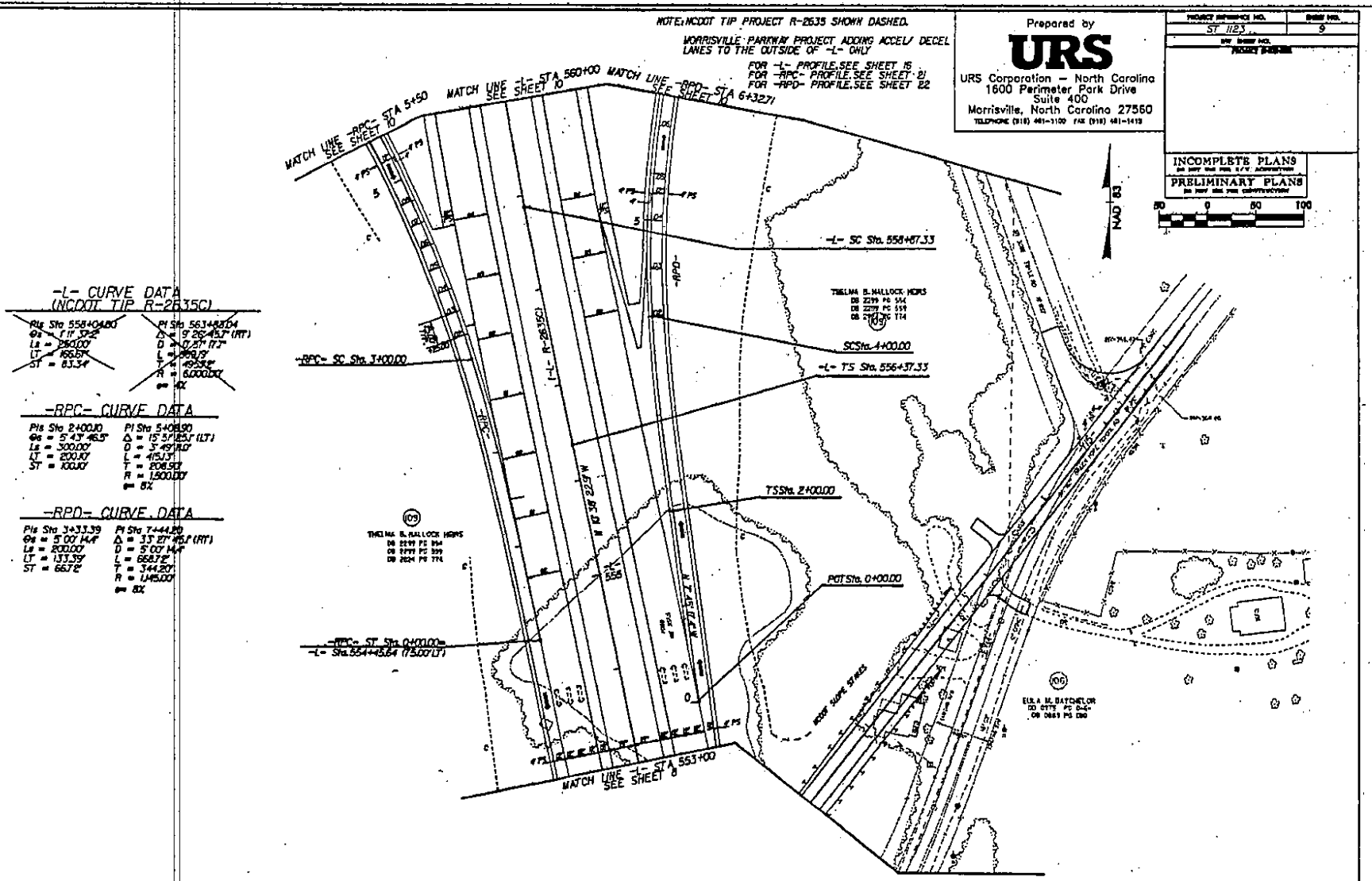
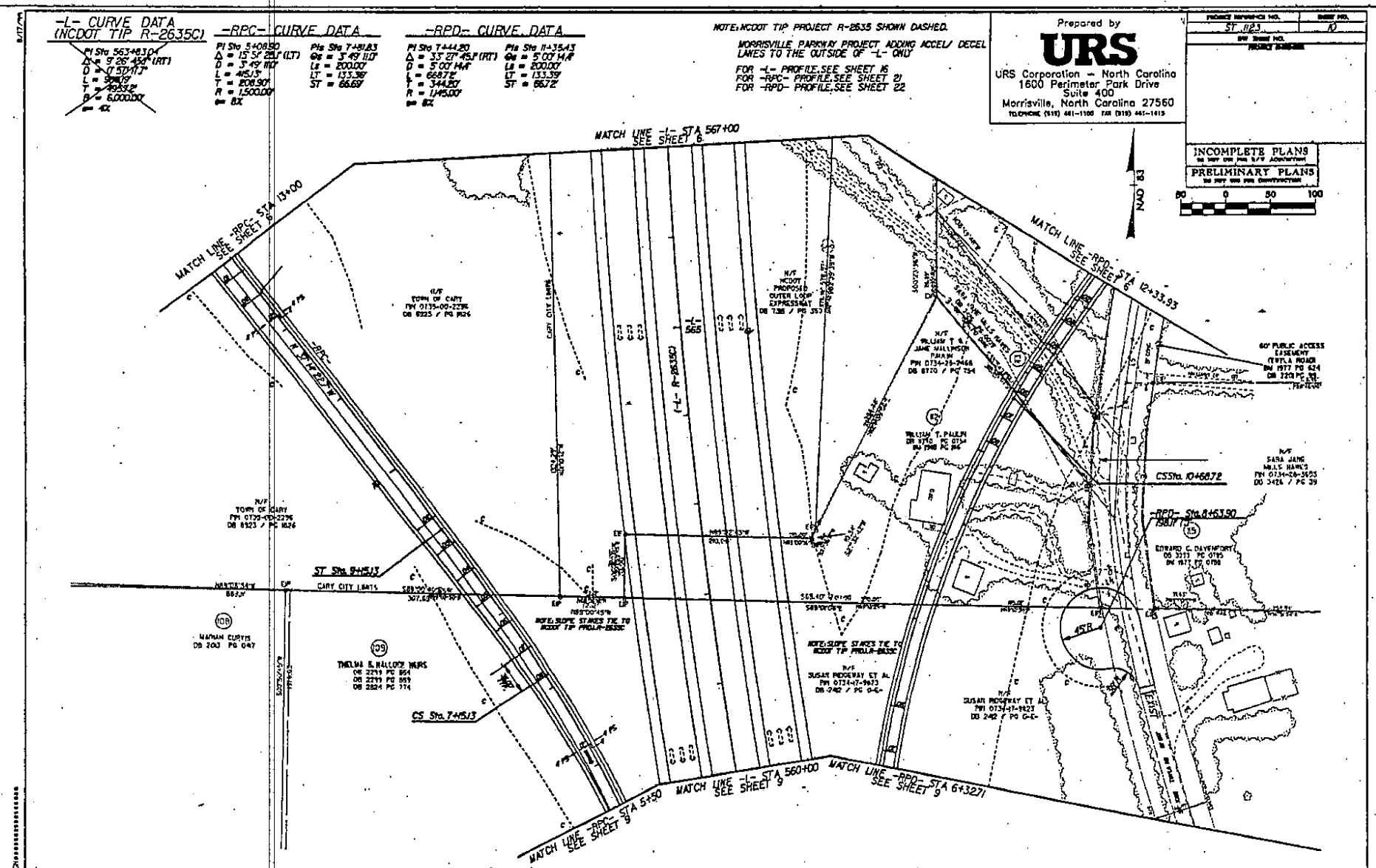
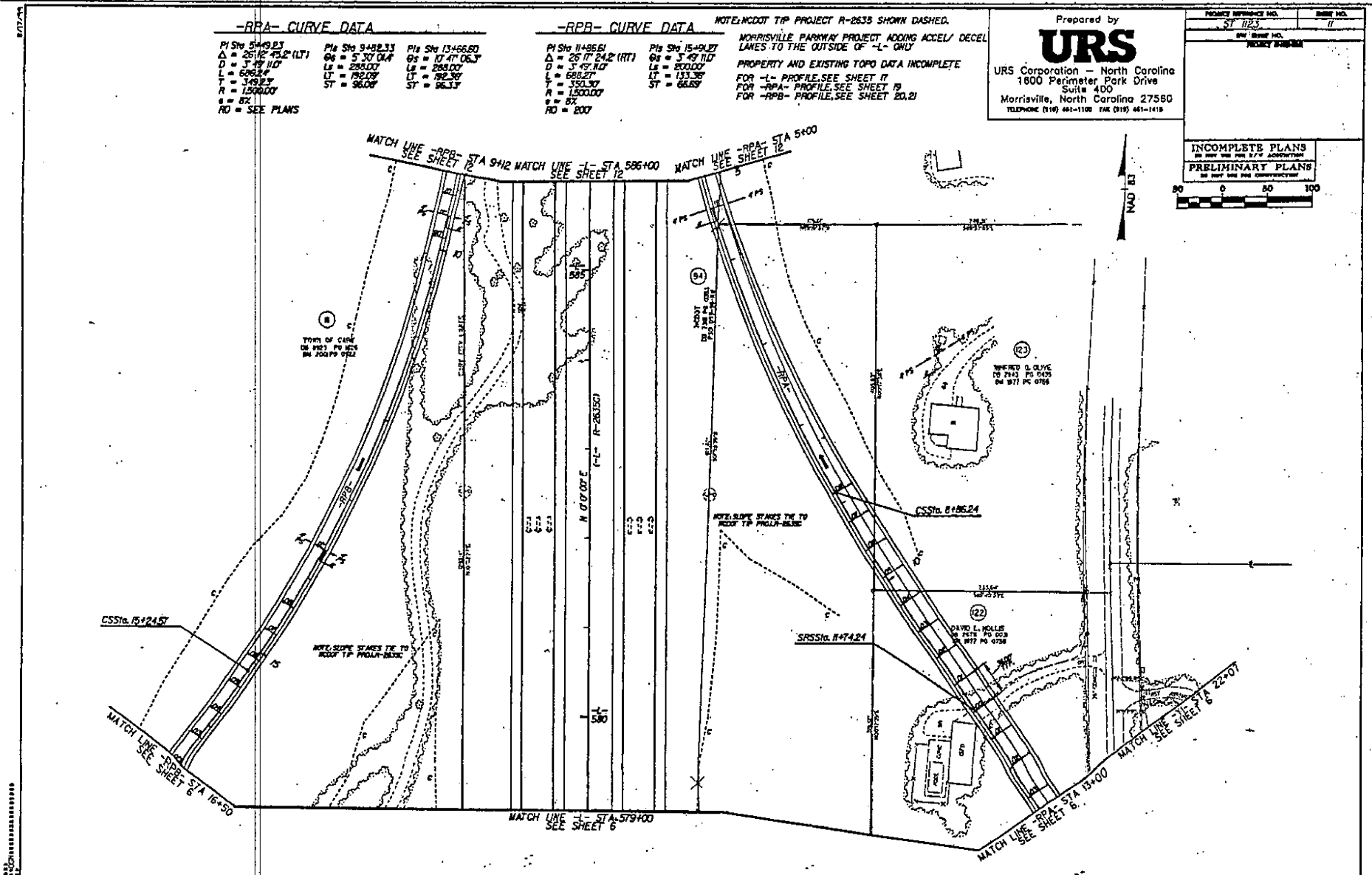


NOTE: ALL WORK GENERATED USING AVAILABLE GIS DATA PROVIDED BY THE TOWN OF CARY. NO FIELD DELINIATION OF ENVIRONMENTAL FEATURES HAS BEEN COMPLETED.

Stage 1B and 2 - Preliminary Drawings



Stage 1B and 2 - Preliminary Drawings



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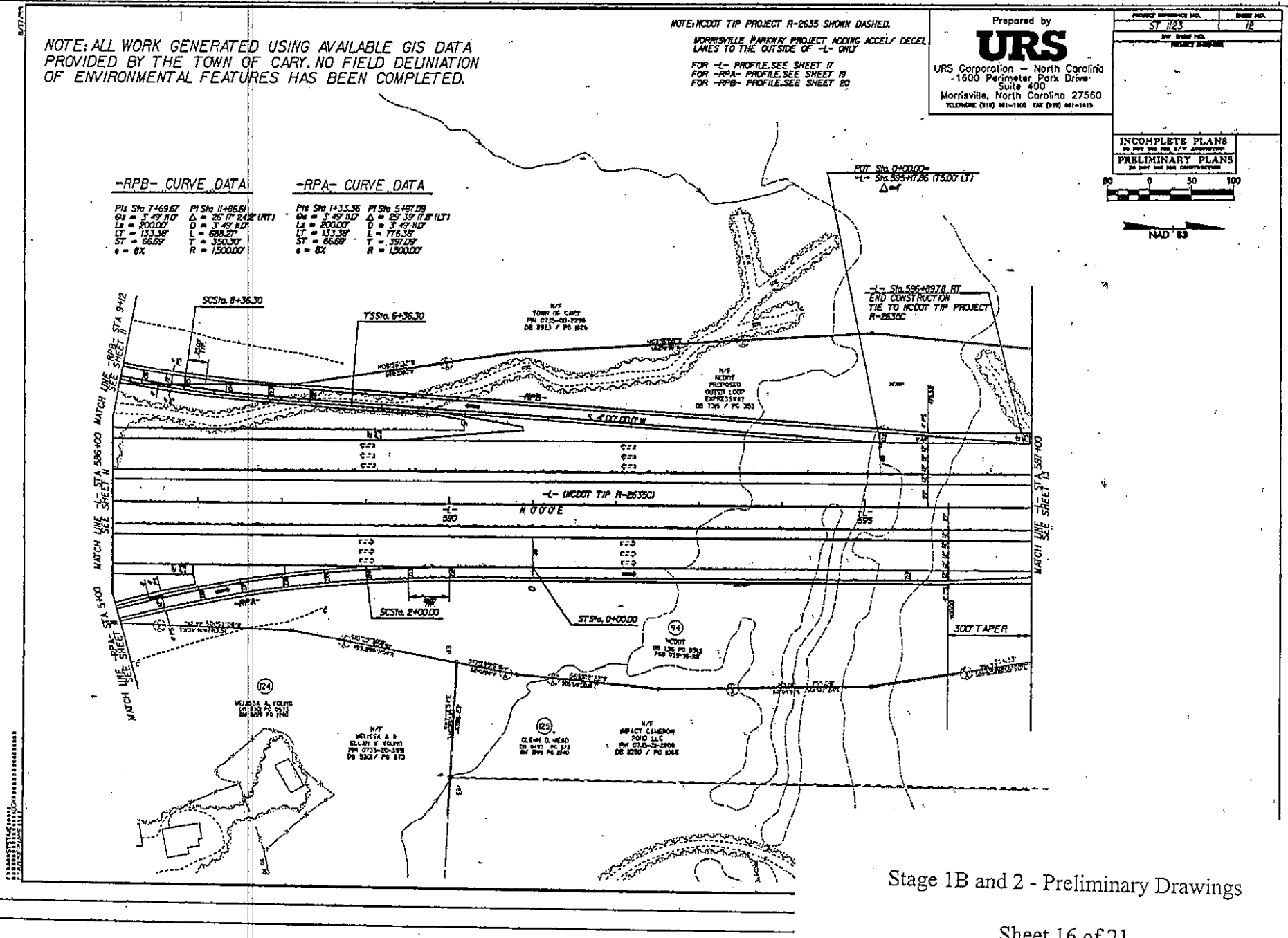
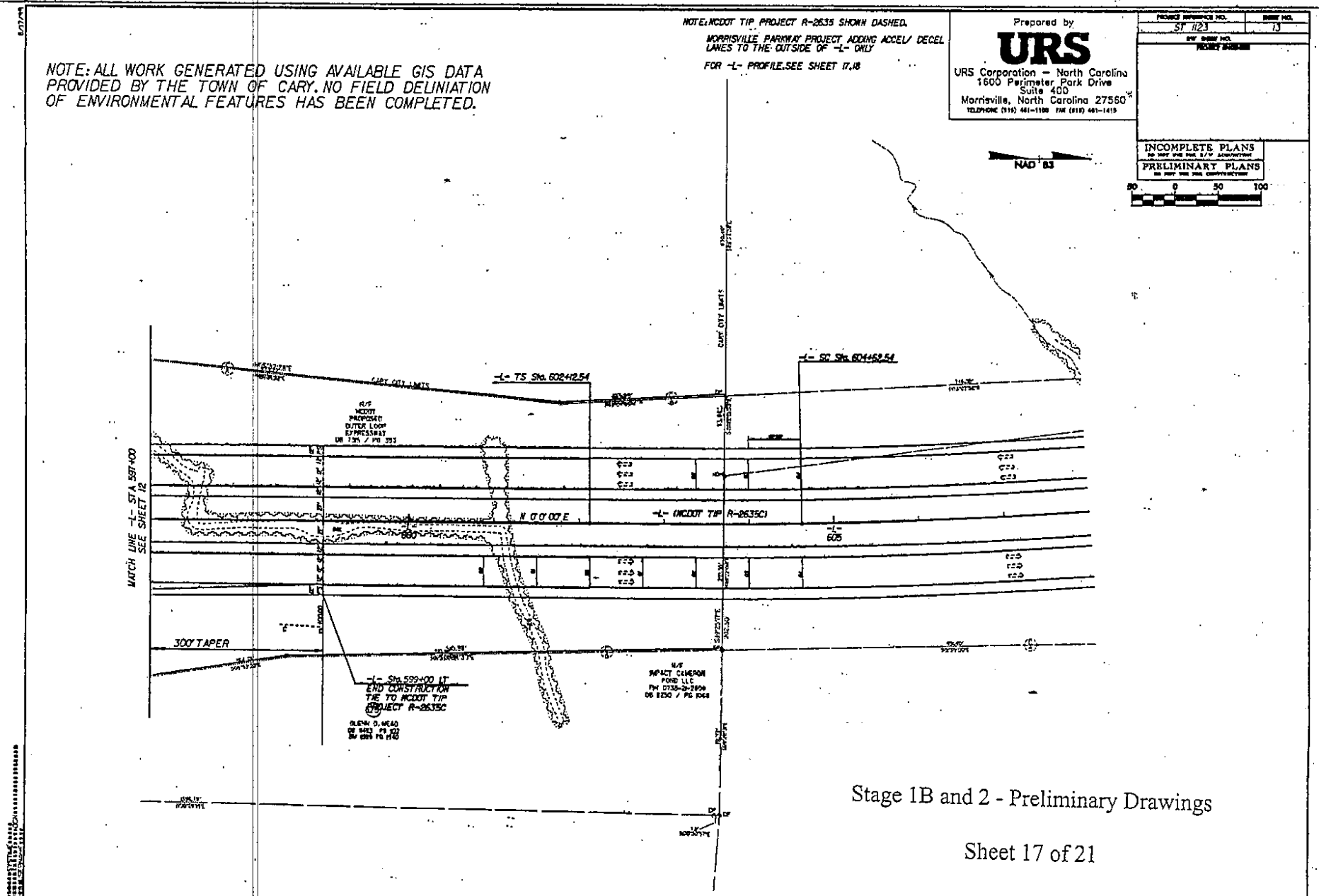


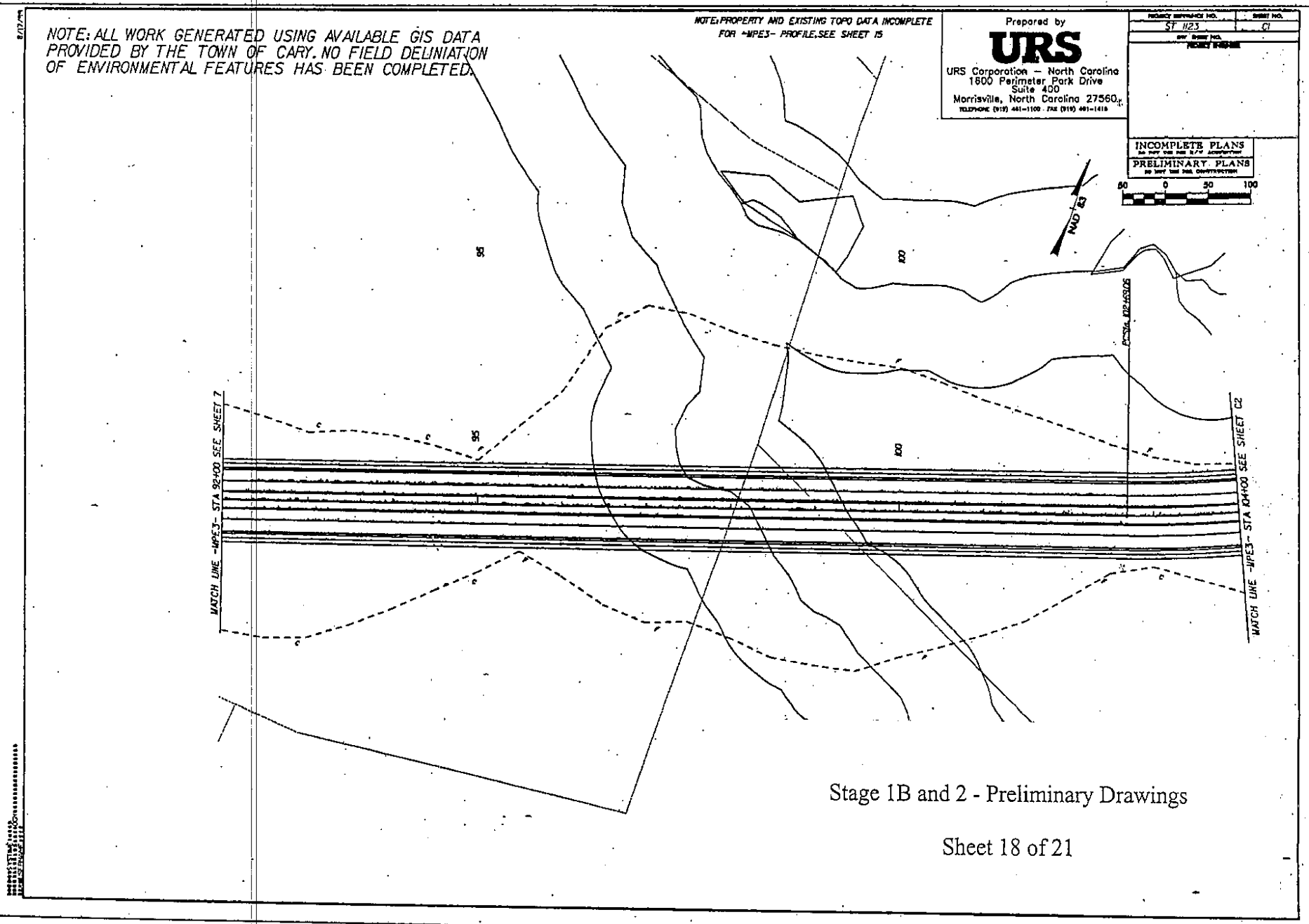
Stage 1B and 2 - Preliminary Drawings

Sheet 16 of 21



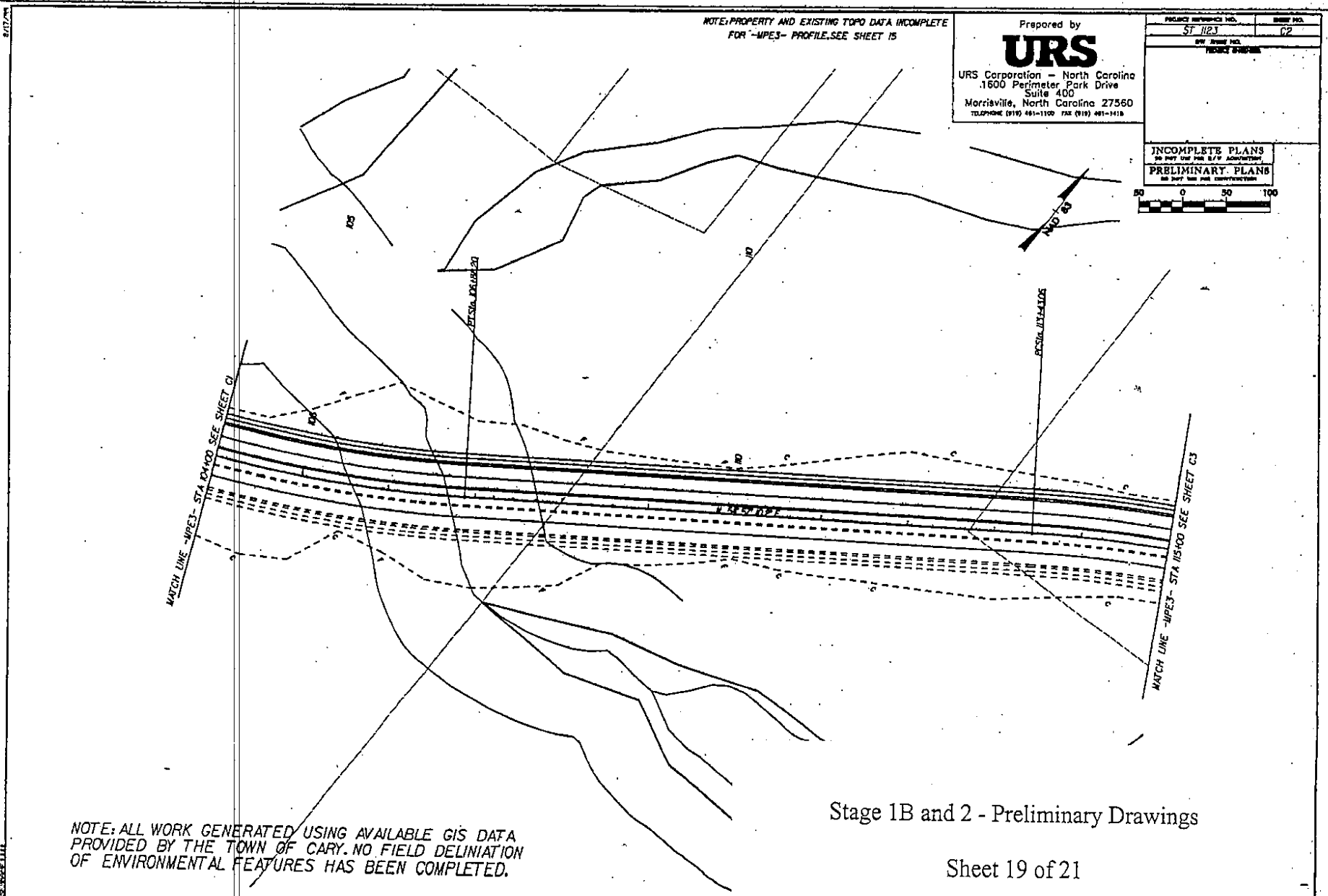
Stage 1B and 2 - Preliminary Drawings

Sheet 17 of 21



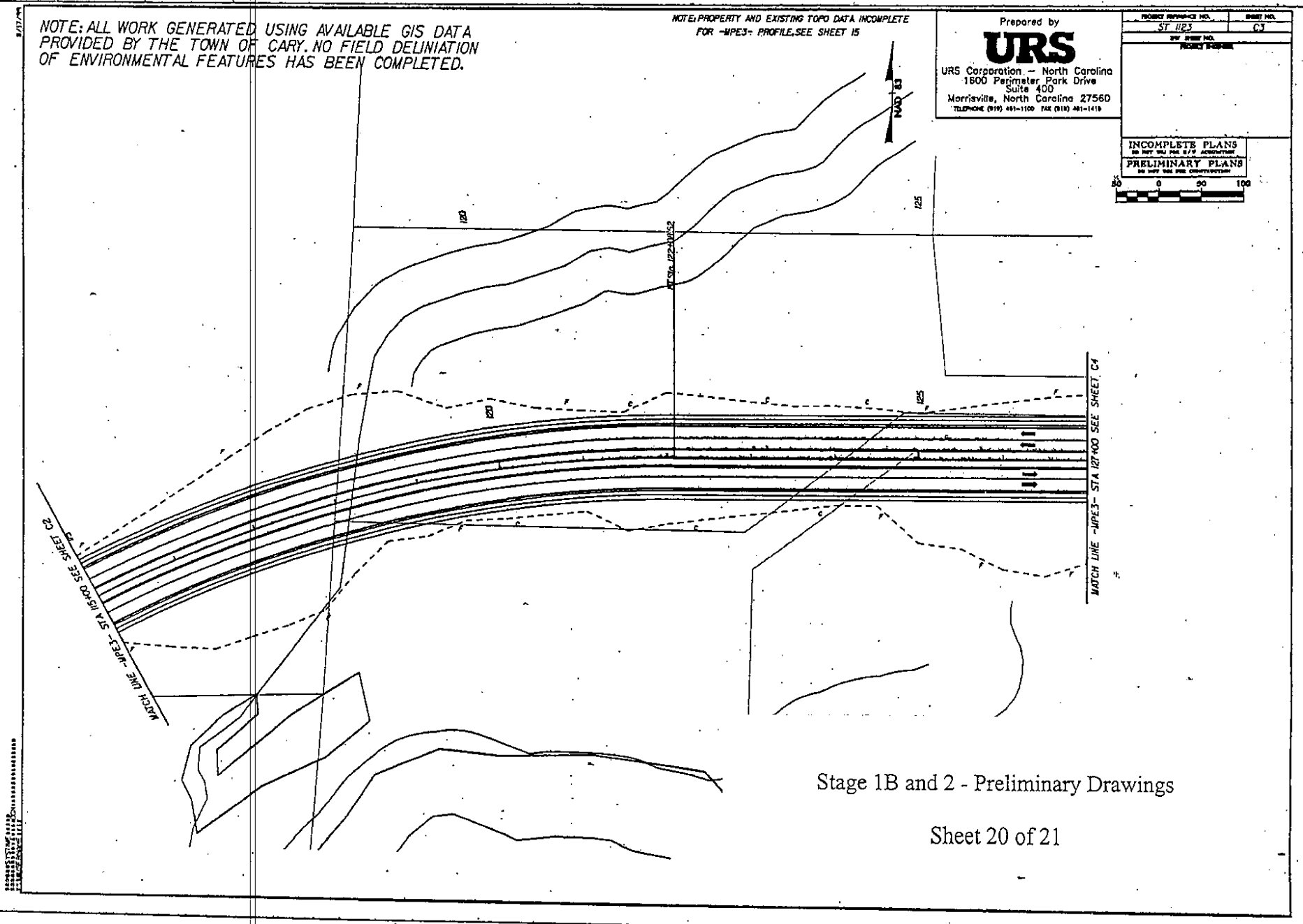
Stage 1B and 2 - Preliminary Drawings

Sheet 18 of 21



Stage 1B and 2 - Preliminary Drawings

Sheet 19 of 21



Stage 1B and 2 - Preliminary Drawings

Sheet 20 of 21

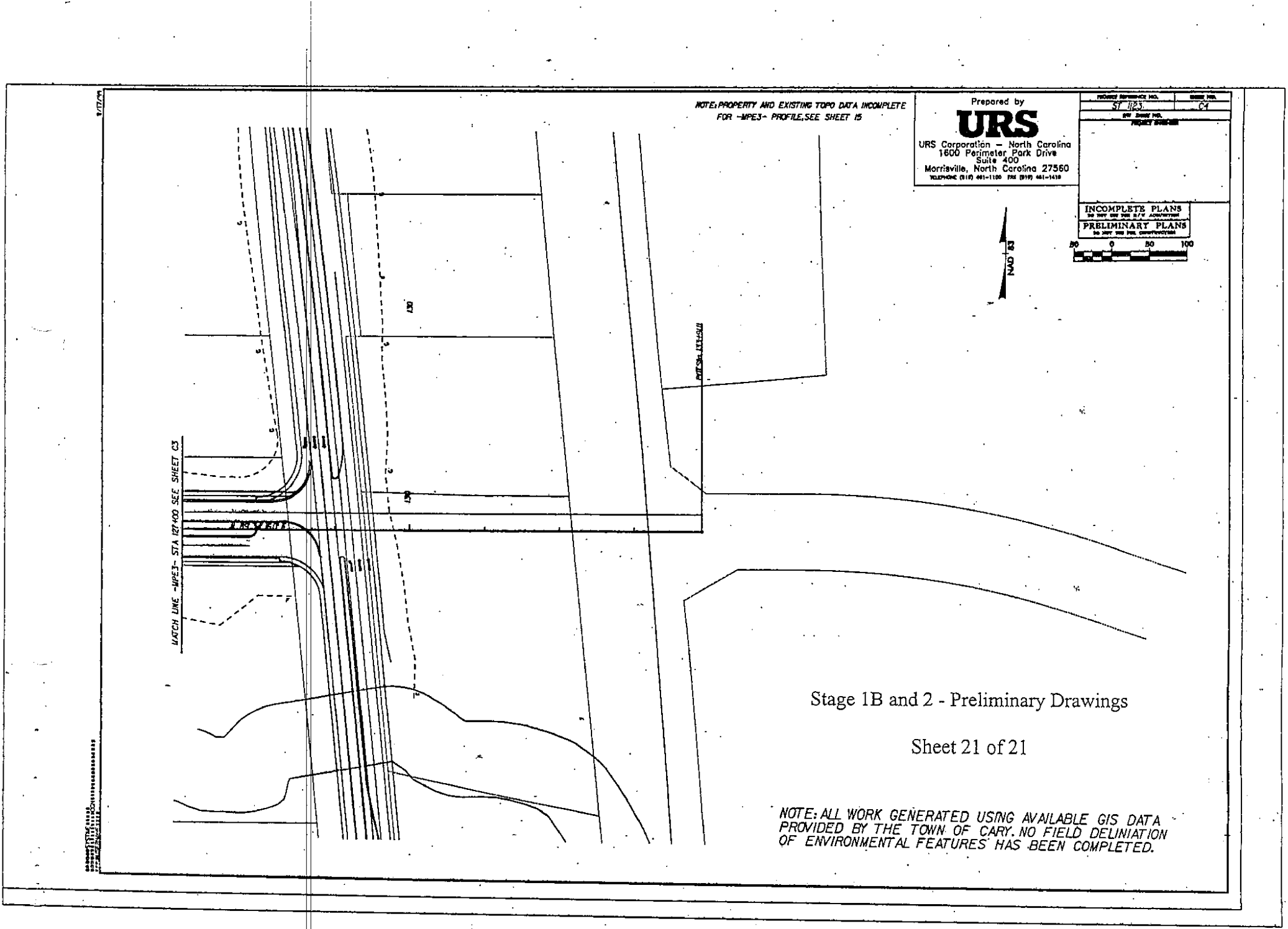

NOTE: PROPERTY AND EXISTING TOPO DATA INCOMPLETE
FOR -WPE3- PROFILE, SEE SHEET 15
Prepared by
URS
URS Corporation – North Carolina
1600 Perimeter Park Drive
Suite 400
Morrisville, North Carolina 27560
INCOMPLETE PLANS
PRELIMINARY PLANS
NAD 83
MATCH LINE -WPE3- STA 127+00 SEE SHEET C3
Stage 1B and 2 - Preliminary Drawings
Sheet 21 of 21
NOTE: ALL WORK GENERATED USING AVAILABLE GIS DATA PROVIDED BY THE TOWN OF CARY. NO FIELD DELINIATION OF ENVIRONMENTAL FEATURES HAS BEEN COMPLETED.

Exhibit A

Michael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Coleen H. Sullins, Director
Division of Water Quality

April 8, 2008

Mr. Russ Overton
Town of Cary – Engineering Department
P.O. Box 8005
Cary, NC 27512-8005

Re: Town of Cary Morrisville Parkway Extension – Phase III, Wake County
DWQ #20080640; USACE Action ID. No. SAW-2008-00373
Ut to Panther Creek [030605, 16-41-1-17-3, WSIV, NSW]
APPROVAL of 401 Water Quality Certification with Additional Conditions

Dear Mr. Overton:

Attached hereto is a copy of Certification No. 3737 issued to Mr. Russ Overton and Town of Cary, dated April 8, 2008. In addition, you should get any other federal, state or local permits before you go ahead with your project including (but not limited to) Solid Waste, Sediment and Erosion Control, Stormwater, Dam Safety, Non-discharge and Water Supply Watershed regulations.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Coleen H. Sullins

CHS/cbk/*ijm*

Attachments: NCDWQ 401 WQC Summary of Permanent Impacts and Mitigation Requirements
Certificate of Completion

cc: Becky Fox, EPA, 1307 Firefly Road, Whittier, NC 28789
U.S. Army Corps of Engineers, Raleigh Regulatory Field Office, Wilmington District, USACE
Lauren Witherspoon, DWQ, Raleigh Regional Office
DLR Raleigh Regional Office
File Copy
Central Files
Charles Benton, URS Corporation, 1600 Perimeter Park Drive, Suite 400, Morrisville, NC 27560-8421

Filename: **080640MorrisvilleParkwayExtPhIII(Wake)401_IC**

401 Oversight/Express Review Permits Unit
1650 Mail Service Center, Raleigh, North Carolina 27699-1650
2321 Crabtree Boulevard, Suite 250, Raleigh, North Carolina 27604
Phone: 919-733-1786 / FAX 919-733-6893 / Internet: http://h2o.enr.state.nc.us/ncwetlands

NORTH CAROLINA 401 WATER QUALITY CERTIFICATION

THIS PERMIT AUTHORIZATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Quality (DWQ) Regulations in 15 NCAC 2H, Section .0500 to Mr. Russ Overton and Town of Cary, to fill or otherwise permanently impact 0.72 acres of 404/wetland and 3,412 linear feet of perennial stream to construct the proposed Town of Cary - Morrisville Parkway Extension – roadway segment Phase III, which is located between NC Highway 55 and SR 1625, Green Level to Durham Road at SR 1600, Green Level Church Road, near Cary, Wake County, North Carolina, pursuant to an application dated January 25, 2008 and received by the DWQ on January 30, 2008, and by Public Notice by the U.S. Army Corps of Engineers issued on the 15th day of February of 2008 (received by DWQ on February 15, 2008).

The application and supporting documentation provides adequate assurance that the proposed work will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application, the supporting documentation, and conditions hereinafter set forth.

This Approval is only valid for the purpose and design submitted in the application materials and as described in the Public Notice. If the project is changed, prior to notification a new application for a new Approval is required. If the property is sold, the new owner must be given a copy of the Approval and Approval letter and is thereby responsible for complying with all conditions of this Approval. Any new owner must notify the Division and request the Approval be issued in their name. Should wetland or stream fill be requested in the future, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). If any plan revisions from the approved site plan result in a change in stream or wetland impact or an increase in impervious surfaces, the DWQ shall be notified in writing and a new application for 401 Certification may be required. For this Approval to be valid, compliance with the conditions listed below is required.

Conditions of Approval:

1. Impacts Approved

   The following impacts are hereby approved as long as all of the other specific and general conditions of this Approval are met. No other impacts are approved including incidental impacts:

Type of Impact	Amount Approved (Units)	Plan Location or Reference
404/Wetland	0.72 (acres)	Application and PN
Stream - perennial	3,412 (linear feet)	Application and PN

Sediment and Erosion Control:

2. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to protect surface waters standards:

   a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual.*
   b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most

recent version of the *North Carolina Sediment and Erosion Control Manual.* The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.

c. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

3. No waste, spoil, solids, or fill of any kind shall occur in wetlands, waters, or riparian areas beyond the footprint of the impacts depicted in the 404/401Permit Application. All construction activities, including the design, installation, operation, and maintenance of sediment and erosion control Best Management Practices, shall be performed so that no violations of state water quality standards, statutes, or rules occur;

4. Sediment and erosion control measures shall not be placed in wetlands or waters to the maximum extent practicable. If placement of sediment and erosion control devices in wetlands and waters is unavoidable, they shall be removed and the natural grade restored within six months of the date that the Division of Land Resources has released the project;

5. Protective Fencing - The outside buffer, wetland or water boundary and along the construction corridor within these boundaries approved under this authorization shall be clearly marked with orange warning fencing (or similar high visibility material) for the areas that have been approved to infringe within the buffer, wetland or water prior to any land disturbing activities;

Continuing Compliance:

6. Mr. Russ Overton and Town of Cary shall conduct construction activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with section 303(d) of the Clean Water Act) and any other appropriate requirements of State law and federal law. If the Division determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the Division may reevaluate and modify this Approval to include conditions appropriate to assure compliance with such standards and requirements in accordance with 15A NCAC 2H.0507(d). Before modifying the Approval, the Division shall notify Mr. Russ Overton and Town of Cary, and the US Army Corps of Engineers, provide public notice in accordance with 15A NCAC 2H.0503 and provide opportunity for public hearing in accordance with 15A NCAC 2H.0504. Any new or revised conditions shall be provided to Mr. Russ Overton and Town of Cary in writing, shall be provided to the United States Army Corps of Engineers for reference in any Permit issued pursuant to Section 404 of the Clean Water Act, and shall also become conditions of the 404 Permit for the project;

Mitigation:

7. Compensatory Mitigation Using the Ecosystem Enhancement Program (EEP)

   Mitigation must be provided for the proposed impacts as specified in the table below. We understand that you wish to make a payment to the Wetlands Restoration Fund administered by the NC Ecosystem Enhancement Program (EEP) to meet this mitigation requirement. This has been determined by the DWQ to be a suitable method to meet the mitigation requirement. Until the EEP receives and clears your check (made payable to: DENR – Ecosystem Enhancement Program Office), no impacts specified in this Authorization Certificate shall occur. The EEP should be contacted at (919) 733-5205 if you have any questions concerning payment into a

restoration fund. You have *90 days* from the date of this approval to make this payment. **For accounting purposes, this Authorization Certificate authorizes payment into the Wetlands Restoration Fund to meet the following compensatory mitigation requirement:**

Type of Impact	Compensatory Mitigation Required	River and Sub-basin Number
Stream (perennial)	3,412 (linear feet)	Cape Fear/03030003

8. Construction Stormwater Permit NCG010000

Upon the approval of an Erosion and Sedimentation Control Plan issued by the Division of Land Resources (DLR) or a DLR delegated local erosion and sedimentation control program, an NPDES General stormwater permit (NCG010000) administered by DWQ is automatically issued to the project. This General Permit allows stormwater to be discharged during land disturbing construction activities as stipulated by conditions in the permit. If your project is covered by this permit [applicable to construction projects that disturb one (1) or more acres], full compliance with permit conditions including the sedimentation control plan, self-monitoring, record keeping and reporting requirements are required. A copy of this permit and monitoring report forms may be found at *http://h2o.enr.state.nc.us/su/Forms_Documents.htm.*;

9. Certificate of Completion

Upon completion of all work approved within this Approval, and any subsequent modifications, the applicant is required to return the attached certificate of completion to the 401 Oversight/Express Review Permitting Unit, North Carolina Division of Water Quality, 1650 Mail Service Center, Raleigh, NC, 27699-1650.

Also, this Approval to proceed with your proposed impacts or to conduct impacts to waters as depicted in your application shall expire upon expiration of the 404 or CAMA Permit.

If this Approval is unacceptable to you, you have the right to an adjudicatory hearing upon written request within sixty (60) days following receipt of this Approval. This request must be in the form of a written petition conforming to Chapter 150B of the North Carolina General Statutes and filed with the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. If modifications are made to an original Approval, you have the right to an adjudicatory hearing on the modifications upon written request within sixty (60) days following receipt of the Approval. Unless such demands are made, this Approval shall be final and binding.

This the 8th day of April 2008
DIVISION OF WATER QUALITY

for Coleen H. Sullins

3737

CHS/cbk/*ijm*

.ichael F. Easley, Governor

William G. Ross Jr., Secretary
North Carolina Department of Environment and Natural Resources

Alan W. Klimek, P.E. Director
Division of Water Quality

North Carolina Division of Water Quality
401 Water Quality Certification
Summary of Permitted Impacts and Mitigation Requirements

In accordance with 15A NCAC 2H.0500, Mr. Russ Overton of the Town of Cary, have permission as outlined below to fill or otherwise impact 0.72 acres of 404/wetland and 3,412 linear feet of perennial stream associated with construction of the proposed Morrisville Parkway Extension, Phase III which is located between NC Highway 55 and SR 1625, Green Level to Durham Road at SR 1600, Green Level Church Road, near Cary, in Wake County, North Carolina. All activities associated with these authorized impacts must be conducted with the conditions listed in the attached Permit transmittal letter. THIS CERTIFICATION IS NOT VALID WITHOUT THE ATTACHMENTS.

COMPENSATORY MITIGATION REQUIREMENTS, ECOSYSTEM ENHANCEMENT PROGRAM

DWQ PROJECT #: 20051360, Ver. 4
LOCATION: Cary
COUNTY Wake
BASIN/ SUB BASIN Cape Fear/03030003

As required by 15A NCAC 2H.0500, and the conditions of this Certification, you are required to compensate for the above mitigable impacts through the restoration, creation, enhancement or preservation of wetlands, surface waters and riparian buffers as outlined below prior to conducting any activities that impact or degrade the waters of the state.

Note: Acreage requirements proposed to be mitigated through the Ecosystem Enhancement Program must be rounded to one-quarter acre increments and linear foot requirements must be rounded up to the nearest foot according to 15 2R.0503(b).

Impacts	Mitigation
3,412 Linear Feet of Perennial Stream	3,412 Linear Feet of Perennial Stream

One of the options you have available to satisfy the compensatory mitigation requirement is through the payment of a fee to the Wetlands Restoration Fund per NCAC 2R.0503. If you choose this option, please sign this form and mail the form along with a copy of your 401 Certification or Buffer Approval to the Ecosystem Enhancement Program at the address below. An invoice for the appropriate amount of payment will be sent to you upon receipt of this form. PLEASE NOTE, THE ABOVE IMPACTS ARE NOT AUTHORIZED UNTIL YOU RECEIVE NOTIFICATION THAT YOUR PAYMENT HAS BEEN PROCESSED BY THE ECOSYTEM ENHANCMENT PROGRAM.

Signature _____ Date _____

ECOSYSTEM ENHANCEMENT PROGRAM
1652 Mail Service Center
RALEIGH, N.C. 27699-1652
(919) 733-5205

Filename: 080640MorrisvilleParkwayExtPhIII(Wake)401_IC_EEP

NCSHPO Coordination

North Carolina Department of Cultural Resources

State Historic Preservation Office

Peter B. Sandbeck, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

September 13, 2005

Marvin A. Brown
URS Corporation
1600 Perimeter Park Drive, Suite 400
Morrisville, NC 27560

Re: Reconnaissance – Level Survey Report, Letter Form: Sections A and B of Morrisville Parkway, Phase III, NC 55 to Green Level Church Road, Town of Cary, (ST – 1123), Wake County, ER05-1875

Dear Mr. Brown:

Thank you for the transmission of your reconnaissance survey concerning the above project.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following properties are not eligible for the National Register:

- (Resource A) House at 910 Twyla Road, Cary
- (Resource B) Farm at Green Hope School Road, Cary
- (Resource C) Batchelor House/House at 7316 Green Hope School Road, Cary
- (Resource D) Batchelor House/House at 7326 Green Hope Road, Cary

Therefore, we have no further comment on Sections A and B of the project as proposed.
The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-733-4763. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

Peter Sandbeck

cc: Russ Overton, Town of Cary

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

December 29, 2011

Keith Lewis
Mation/Alexiou/Bryson, PC
4000 Westchase Boulevard, Suite 350
Raleigh, NC 27607

Re: Morrisville Parkway Extension, U-5315, Wake County, ER 11-2340

Dear Mr. Lewis:

Thank you for your e-mail of December 6, 2011, concerning the above project.

There are no known archaeological sites within the proposed project area. Based on our knowledge of the area, it is unlikely that any archaeological resources that may be eligible for inclusion in the National Register of Historic Places will be affected by the project. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

The western half of this project's Area of Potential Effect (APE), from the project beginning up to and including the proposed interchange with NC 540, was surveyed in 2005 for Phase III of the Morrisville Parkway Extension (Sections A and B). Four properties were identified in this part of the APE; all were determined not eligible for listing in the National Register of Historic Places. Enclosed is a copy of our 2005 letter concurring with this determination. We recommend that no additional architectural survey be conducted in this portion of the APE for this project.

However, the eastern half of this project's APE (Section C) has not been surveyed. We have conducted a search of our maps and files and located the following structures of historical or architectural importance within this portion of the APE:

- Tom Smith Farm (WA 0981).

The location of this property is available on our GIS website: http://gis.ncdcr.gov/hpoweb/.

We recommend that an architectural historian identify and evaluate any structures over fifty (50) years of age within the eastern half of the project area, from the interchange with NC 540 to the project end, and report the findings to us.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

Enclosure

cc: Mary Pope Furr, NC DOT, mfurr@ncdot.gov
Gary Roth, Wake County Historic Preservation Commission, groth@cappresinc.org

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

July 16, 2012

Keith Lewis
Martin/Alexiou/Bryson, P.C.
4000 WestChase Boulevard, Suite 530
Raleigh, NC 27607

Re: Morrisville Parkway Extension, U-5315, Wake County, ER 11-2340

Dear Mr. Lewis:

Thank you for your letter of June 15, 2012, concerning the above project, and for bringing the results of the 2011-2012 Cary Historic Resources Study and Inventory Update to our attention. In light of these results, we retract our earlier recommendation, and instead find that no additional historic architectural survey work is required.

Although, we have not received the final survey materials from the Town of Cary yet, we concur with the recommendations of the survey that, for the purpose of compliance with Section 106 of the National Historic Preservation Act, the following properties are not eligible for listing in the National Register of Historic Places:

- **Tom Scott Farm** (WA 0981);
- **House** (WA 7205);
- **House** (WA 7197); and,
- **House** (WA 0760).

Therefore, we are aware of no historic resources that would be affected by the project, and we have no comment on the project as proposed.

We urge the Town of Cary to forward the final survey materials to us as soon as possible so that our maps and files can be properly updated and to avoid any future confusion.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Todd Delk, Town of Cary, todd.delk@townofcary.org
Mary Pope Furr, NC DOT, mfurr@ncdot.gov
Gary Roth, Wake County Historic Preservation Commission, groth@cappresinc.org

NCTA Correspondence on Power Transmission Lines

Lauren Triebert

From: Howard Woodall [hwoodall@rkk.com]
Sent: Wednesday, August 22, 2012 12:56 PM
To: Lauren Triebert
Cc: Brian Peeler
Subject: Fwd: R-2635C I-540, Sheet 12

Lauren,
Brain Peeler in our office has asked I give you information on the Progress Energy Carolinas transmission line involved on the Morrisville Parkway project. Please see the email string below for backup of the cost and moratorium from PEC. Let me know if you receive this OK or if you have any questions.
Regards,
Howard

Howard T. Woodall, III, P.E.
Project Manager

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 Office
919.612.0316 Cell
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Cc: "Brian Peeler" <bpeeler@rkk.com>, "Sheila Talton" <Sheila.Talton@pgnmail.com>
Sent: Thursday, May 17, 2012 3:51:13 PM
Subject: RE: R-2635C I-540, Sheet 12

Anytime is fine…I will be here.

Cooper

Cooper Dwiggins, P.E.
Transmission Area Coordinator - NCTA
919-329-5882 (office)
745-5882 (vnet)
919-622-4750 (cell)
cooper.dwiggins@pgnmail.com

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Thursday, May 17, 2012 3:33 PM
To: Dwiggins, Cooper

Cc: Brian Peeler; Talton, Sheila
Subject: Re: R-2635C I-540, Sheet 12

Cooper,
Thanks. Again, this is exactly what we need and appreciate the quick response. I had not forgotten the relocation moratorium and we have made others aware.
What we are currently studying are two alternatives in which we have the Morrisville Parkway crossing your right-of-way and a ramp plus a loop also crossing your right-of-way.
We need to make sure NCDOT/NCTA will be OK with access to your poles from Morrisville Parkway and across the loop along your right-of-way. I will advise once we have discussed with them.
Once we have the alternatives laid out, we can send you a copy to see if you see any fatal flaws from a PEC perspective if you would like. Just let me know whenever it is convenient.

Thank you,
Howard

Howard T. Woodall, III, P.E.
Project Manager

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 Office
919.612.0316 Cell
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Cc: "Brian Peeler" <bpeeler@rkk.com>, "Sheila Talton" <Sheila.Talton@pgnmail.com>
Sent: Thursday, May 17, 2012 2:46:53 PM
Subject: RE: R-2635C I-540, Sheet 12

Howard,

Adjusting an existing pole and/or extensions are not an option.

Per pole you are looking at ballpark $1M to relocate. Naturally, these are our most expensive type of structures. If you need additional height, we might only require one new structure, if we need to swing the line out for an interchange, you are probably looking at least 3 structures. The biggest issue with relocating will be the construction timeframe. Going back to my last thought of the original email back last April, this line cannot be taken out of service for any reason until October 2014. (Unless we can build a temporary line, but I would not even begin to venture a guess how expensive that would be, if possible). Basically, we cannot perform any sort of modification/reroute until October 2014.

I am no longer in engineering, but if you have some plans for us to look at for a ball park estimate, I am the right person to get you into our process. We do now charge for ballpark estimates, 1% of the estimate total to a max of $2500, so in this case I would assume $2500, which is non-refundable.

Cooper

Cooper Dwiggins, P.E.
Transmission Area Coordinator - NCTA
919-329-5882 (office)
745-5882 (vnet)
919-622-4750 (cell)
cooper.dwiggins@pgnmail.com

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Thursday, May 17, 2012 1:47 PM
To: Dwiggins, Cooper
Cc: Brian Peeler; Talton, Sheila
Subject: Re: R-2635C I-540, Sheet 12

Cooper,
Thank you again for the quick response. This information is very helpful. We are very hopeful that NO adjustments will be needed. If we need to justify an alignment to avoid your facilities, how expensive (ballpark cost) is it to:
1. adjust an existing pole? Are pole extensions an option?
2. relocation of one pole?
I understand there are span and vertical angle limitations which sometimes requires multiple poles to be adjusted or relocated to clear a conflict. If we need your input regarding this scenario, we'll be back in touch to see how many would be affected.

Thanks again,
Howard

_____

Howard T. Woodall, III, P.E.
Project Manager

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 Office
919.612.0316 Cell
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Cc: "Brian Peeler" <bpeeler@rkk.com>, "Sheila Talton" <Sheila.Talton@pgnmail.com>
Sent: Wednesday, May 16, 2012 4:47:42 PM
Subject: RE: R-2635C I-540, Sheet 12

Howard,

Doing well, hope you are as well.

1. The poles that do not have offsets are deadends placed on the centerline, at these poles the conductor is inline with the poles. The remaining poles are offset (away from I540) by the length of their insulators to keep the conductor on the centerline of the easement. These poles are vertical in configuration, meaning that each phase is over top of the other phases. (In our standard construction your assumption would be correct, but this is a bit of a special case where all the conductors are stacked on top of each other and are pretty much right on top of the centerline, give or take a foot or two here and there.)
2. The guardrail, or any fixed, permanent object (sign, fire hydrant, valve…etc) would be the "starting" point to calculate ground clearance. So if an existing ground clearance is 27, and a 5 foot object were installed, the ground clearance would be 22, and require the line to be raised at least 5 feet. The maximum sag is that lowest curve shown between the structures.

Let me know if you have anymore questions.
Thanks,
Cooper

Cooper Dwiggins, P.E.
Transmission Area Coordinator - NCTA
919-329-5882 (office)
745-5882 (vnet)
919-622-4750 (cell)
cooper.dwiggins@pgnmail.com

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Wednesday, May 16, 2012 4:35 PM
To: Dwiggins, Cooper
Cc: Brian Peeler; Talton, Sheila
Subject: Re: R-2635C I-540, Sheet 12

Cooper,
I hope all is going well.
It has been a while since I talked/emailed to you about the Morrisville Parkway project and its crossing of the PEC transmission line running along I-540. We are finally getting to the point of laying out alternatives for the environmental document we have to prepare and I have just a couple more questions for you relating to the plan/profile sheet you provided (which has been very helpful!!):
1. A couple of the pole notations do not include an offset from the centerline of the PEC right-of-way (ex. #55). I am curious how those are connected to the conductor. Does the conductor move away from the centerline and the pole placed AT the centerline at those locations?
2. You pointed out that there is a required vertical clearance of 27' from the conductor. Is that from the maximum sag line indicated on the profile? If a guardrail is required along the road passing beneath the conductor, is the clearance to the ground line or the guardrail at that point? The guardrail height is approximately 2'4".

Thanks again for your time and guidance,
Howard

Howard T. Woodall, III, P.E.
Project Manager

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 Office
919.612.0316 Cell
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Cc: "Steve Thomas" <sthomas@rkk.com>, "Stuart Samberg" <ssamberg@rkk.com>
Sent: Monday, April 11, 2011 2:45:06 PM
Subject: RE: R-2635C I-540, Sheet 12

Answers in red, sorry for the bad news. I have attached our Transmission Right-of-Way use guidelines as a general reference.

Cooper

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Monday, April 11, 2011 2:27 PM
To: Dwiggins, Cooper
Cc: Steve Thomas; Stuart Samberg
Subject: Re: R-2635C I-540, Sheet 12

Cooper,
We have taken a very quick look at the proposed transmission line and Morrisville Parkway and the ramps to tie to 540 and we are optimistic that we can work around PEC transmission poles.
I have a few questions now that we have done that:
1. Did the transmission design account for a grade on Morrisville Parkway or was it assumed that MPkwy would be set close to the existing ground line? No, the TOC was not far enough along for us to change our design on their behalf. We were only provided with conceptual plans for an unfunded (at the time) project.
2. Will PEC accept a retaining wall at least 25' from the pole in order to avoid a roadway cut slope encroaching into the pole as long as there is access to maintain the pole? I seem to recall from previous discussions like this that the steepest slope in the area where access would be needed is 4:1. Vertical clearance requirements will have to be met of course. 4:1 is the steepest slope we will allow. We cannot allow retaining walls in our R/W. (We have 70' of right of way on this project, and the tangent poles are offset away from the centerline to the west to allow the conductor to stay on the centerline of the right-of-way.)
3. What is the status of the installation? Are the poles being fabricated at this time? And when do you anticipate them being installed? The right of way is cleared, the poles are ordered and currently being fabricated. We will start construction in October 2011. Unfortunately once this line is finished and energized in October 2012, it will be nearly impossible, if not impossible, to get the line out of service until at least October 2014.
Thank you again for all the help and quick responses,
Howard

Howard T. Woodall, III, P.E.
Senior Project Engineer

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 P
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Sent: Monday, April 11, 2011 12:56:22 PM
Subject: RE: R-2635C I-540, Sheet 12

Not a problem, it is going to be tricky to get around us. The original preliminary design showed the interchange all over us.

Tell Casey hi for me.

Cooper

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Monday, April 11, 2011 11:42 AM
To: Dwiggins, Cooper
Subject: Re: R-2635C I-540, Sheet 12

Cooper! So sorry I didn't make the connection. Great to hear from you. I'll talk to Casey today and will let her know we crossed paths. I hope all is going well at PEC.
And I sincerely appreciate you getting back to me. This project with Cary is hinging on what we are able to do to avoid the lines being installed. Hope to see you soon to discuss in person. that would be very cool.
Take care,
Howard

Howard T. Woodall, III, P.E.
Senior Project Engineer

RK&K
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Raleigh, NC 27609

919.878.9560 P
888.521.4455 (Toll Free)
www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>
Sent: Monday, April 11, 2011 11:09:18 AM
Subject: RE: R-2635C I-540, Sheet 12

I am sure you don't remember, but I graduated college with Casey and Brian. Casey and I worked on a roadway design project at your house once upon a time way back when.

Cooper

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Monday, April 11, 2011 11:05 AM
To: Dwiggins, Cooper
Cc: Steve Thomas; Talton, Sheila
Subject: Re: R-2635C I-540, Sheet 12

Cooper,
Thank you for the plan and profile for the transmission line. Do you have the coordinates for the proposed pole locations? I was hoping that you have a coordinate geometry print out of the pole state plane coordinates. We can then spot the poles on our preliminary plans so we can do all that we can to avoid any conflicts. Our goal here is to completely avoid conflicts both horizontally and vertically. From my scaling on the plan/profile, it appears the vertical clearance required is 26.5'. Is that correct?
Thanks again for your time and information. We greatly appreciate it.
Howard

Howard T. Woodall, III, P.E.
Senior Project Engineer

RK&K
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Raleigh, NC 27609

919.878.9560 P
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www.rkk.com

From: "Cooper Dwiggins" <Cooper.Dwiggins@pgnmail.com>
To: "Sheila Talton" <Sheila.Talton@pgnmail.com>, "Howard Woodall" <hwoodall@rkk.com>
Cc: "Steve Thomas" <sthomas@rkk.com>
Sent: Monday, April 11, 2011 7:33:18 AM
Subject: RE: R-2635C I-540, Sheet 12

Attached is our P&P, that covers the future Morrisville Parkway area. The structures are single poles on foundations.

Thanks,
Cooper

From: Talton, Sheila
Sent: Friday, April 08, 2011 9:01 AM
To: Howard Woodall; Dwiggins, Cooper
Cc: Steve Thomas
Subject: RE: R-2635C I-540, Sheet 12

Cooper, They are actually concerned (see below) about the interchange that will be located at the point where the Parkway and the Turnpike intersect. This would most definitely conflict with at least one structure. Thanks.

SHEILA B TALTON
Progress Energy Carolinas
Sr.Utility Coordinator
1020 W Chatham St
Cary, NC 27511

office 919-481-6126
cell - 919-219-5853
cell - 919-621-0132
fax - 919-468-2914

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Thursday, April 07, 2011 7:12 PM
To: Talton, Sheila
Cc: Steve Thomas
Subject: Re: R-2635C I-540, Sheet 12

Sheila,
I apologize if I have been mis-leading. We are concerned about the new transmission line being installed and how the Morrisville Parkway interchange we are designing will have to be laid out in order to avoid that new transmission line. Now I have the plan sheet PC-11 and PC-12 that shows the proposed transmission line on the west side of the new Western Wake Freeway. I would also like PECps13 that is the next sheet and northward from the Morrisville Parkway crossing. The new ramps that will be connecting to the Morrisville Parkway will be pretty long and will run onto that sheet (13) as well, so we'll need to see where those transmission poles are also.
The attached profile sheet is actually the title sheet for the West Wake Fwy project. The profile I am requesting is of the new PEC transmission line that shows the power line sag. We will need that information to set the profile grade on the Morrisville Parkway project that we are designing so it does not interfere with the new PEC transmission line.
I understand the new transmission poles are single pole structures. Is that correct?

Thanks again your time and help,
Howard

Howard T. Woodall, III, P.E.
Senior Project Engineer

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 P
888.521.4455 (Toll Free)
www.rkk.com

From: "Sheila Talton" <Sheila.Talton@pgnmail.com>
To: "Howard Woodall" <hwoodall@rkk.com>, "Sheila Talton" <Sheila.Talton@pgnmail.com>
Cc: "Sheila Talton" <Sheila.Talton@pgnmail.com>
Sent: Thursday, April 7, 2011 5:08:33 PM
Subject: RE: R-2635C I-540, Sheet 12

We do not have any distribution conflicts on sheet 13, but attached is the plan sheet 13 from DOT as well as the profile sheet. Also attached is our sheet 11 that shows PEC's distribution relocation design.

From: Howard Woodall [mailto:hwoodall@rkk.com]
Sent: Thursday, April 07, 2011 4:32 PM
To: Talton, Sheila
Cc: Roarty, Cynthia
Subject: Re: R-2635C I-540, Sheet 12

Sheila,
After further review, I think the ramps off Morrisville Parkway are pretty long, so it would be beneficial if we could also get the adjacent sheets (PC-11 & PC-13) along with the profile.
Thanks,
Howard

Howard T. Woodall, III, P.E.
Senior Project Engineer

RK&K
900 Ridgefield Drive, Suite 350
Raleigh, NC 27609

919.878.9560 P
888.521.4455 (Toll Free)
www.rkk.com

From: "Sheila Talton" <Sheila.Talton@pgnmail.com>
To: "hwoodall@rkk.com" <hwoodall@rkk.com>
Cc: "Sheila Talton" <Sheila.Talton@pgnmail.com>
Sent: Thursday, April 7, 2011 3:19:36 PM
Subject: R-2635C I-540, Sheet 12

Attached is Progress Energy's distribution relocation design of sheet 12 of the R-2635C I-540 project. PEC transmission is at the top of the page. Let us know if you need anything else.

Sheila B. Talton
sheila.talton@pgnmail.com
Distribution Projects
Utility Coordinator
Progress Energy Carolinas, Inc
1020 West Chatham Street
Cary, NC 27511

* Bell - 919-481-6126
* Co. Cell - 919-219-5853
* Cell - 919-621-0132
* Fax - 919-468-2914

Appendix C

Traffic Noise Analysis
(without technical appendices)

TRAFFIC NOISE ANALYSIS

Morrisville Parkway Extension and NC 540 Interchange

Wake County

NCDOT TIP Project No. U-5315
WBS No. 45429.1.1

Prepared for:

North Carolina Department of Transportation
Project Development and Environmental Analysis Unit
and Town of Cary

Prepared by:
Martin/Alexiou/Bryson, P.C.

September 14, 2012

TRAFFIC NOISE ANALYSIS

Morrisville Parkway Extension and NC 540 Interchange

Wake County

NCDOT TIP Project No. U-5315
WBS No. 45429.1.1

Prepared for:

North Carolina Department of Transportation
Project Development and Environmental Analysis Unit
and Town of Cary

Prepared by:
Martin/Alexiou/Bryson, P.C.

Andrew S. Topp, PTOE, PE
Project Engineer

Keith D. Lewis, PE
Project Manager

Executive Summary

The Town of Cary proposes a roadway on new location between SR 1625 (Green Level Church Road) and NC 55 in Wake County, including an interchange with the newly opened NC 540 toll road. The project study area includes the area between SR 1625 (Green Level Church Road) and NC 55 along the proposed new roadway alignment that was established previously by the Town of Cary. A provision for the planning and environmental study of this project is included in the North Carolina Transportation Improvement Program as TIP Project No. U-5315.

The proposed typical section for the Morrisville Parkway Extension consists of a four-lane, raised median divided roadway with curb and gutter. The standard median width is 21 feet and includes curb and gutter on each side. The median is narrowed in sections to facilitate left-turn lanes. Lane widths for the proposed cross section consist of one inner 12-foot wide travel lane and one 14-foot wide outside travel lane. The additional width of the outside lane can accommodate bicycle traffic; however, there is also a 10-foot wide multi-use path proposed along the north side of a portion of the roadway from NC 55 westward to the future Highcroft Drive Extension. A five-foot wide sidewalk is proposed along both sides of the remainder of the roadway; where the multi-use path is on the north side, a five-foot sidewalk would be constructed on the south side. The proposed speed limit along the roadway is 45 miles per hour.

Traffic noise impacts and temporary construction noise impacts can be a consequence of transportation projects. This Traffic Noise Analysis utilized computer models created with the FHWA Traffic Noise Model software (TNM 2.5) to predict future noise levels and define impacted receptors along the proposed widening project. Existing traffic noise impacts no receptors in the vicinity of the proposed Morrisville Parkway Extension and NC 540 interchange project. For design year 2035 traffic volumes, the no-build condition is predicted to create four traffic noise impacts; the build condition is predicted to create nine traffic noise impacts. Additionally, Design Year (2035) Build condition traffic noise impacts were predicted for five receptors presently considered as likely to be acquired for project right-of-way. The status of these five potential noise impacts is recommended to be reviewed subject to the project final design.

Consideration for noise abatement measures was given to all impacted receptors. One sound barrier is recommended as meeting feasibility and reasonableness criteria:

-NW1-

The optimized –NW1- sound barrier design is 720 feet long, ranges from 8 feet to 15 feet, with a total area of 9,361 square feet. The barrier is predicted to benefit 21 receptors, including all 9 predicted impacts. The 446 square feet per benefit is less than the maximum allowable 2,955 square feet per benefit. The sound barrier is predicted to provide at least a 7-decibel (7 dB(A)) noise level reduction for 16 first-row receptors.

In accordance with the 2011 NCDOT Traffic Noise Abatement Policy, and based upon the preliminary design of the Morrisville Parkway Extension and NC 540 Interchange, one noise barrier meets applicable feasibility and reasonableness criteria, and is recommended for detailed analysis for the benefit of the predicted traffic noise impacts in the vicinity of the project.

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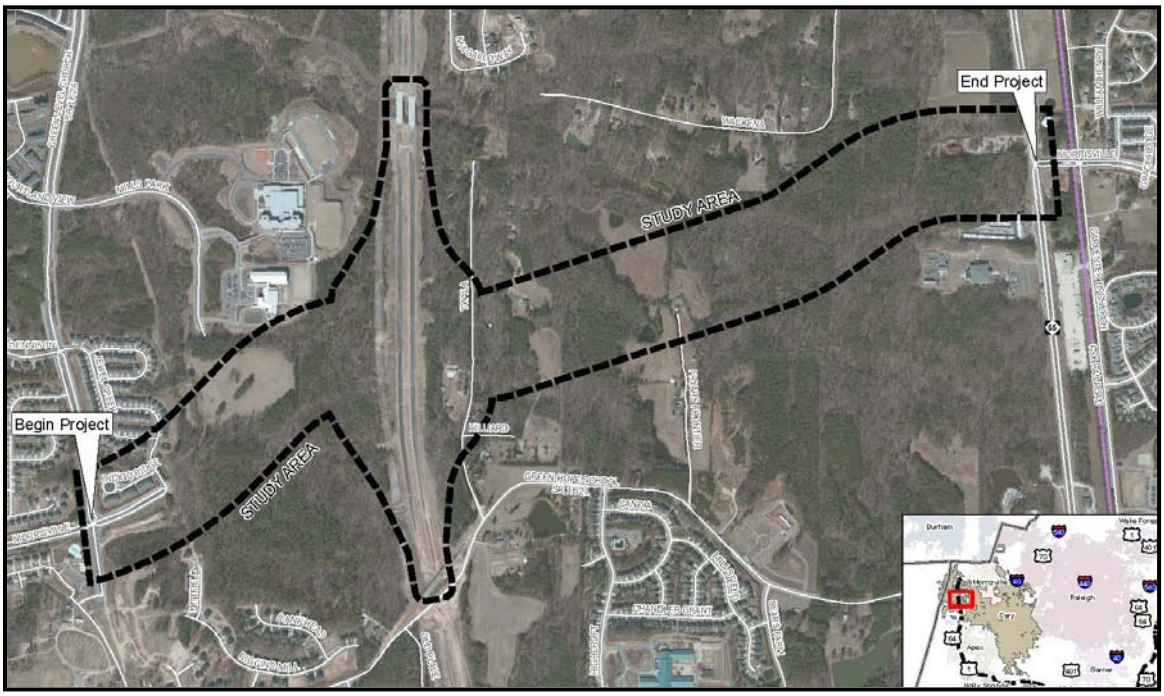
1.0 PROJECT LOCATION AND DESCRIPTION

The Town of Cary proposes a roadway on new location between SR 1625 (Green Level Church Road) and NC 55 in Wake County, including an interchange with the newly opened NC 540 toll road. The project study area includes the area between SR 1625 (Green Level Church Road) and NC 55 along the proposed new roadway alignment that was established previously by the Town of Cary (refer to Figure 1). A provision for the planning and environmental study of this project is included in the North Carolina Transportation Improvement Program as TIP Project U-5315.

Figure 1 Project Study Area



The proposed typical section for the Morrisville Parkway Extension consists of a four-lane, raised median divided roadway with curb and gutter. The standard median width is 21 feet and includes curb and gutter on each side. The median is narrowed in sections to facilitate left-turn lanes. Lane widths for the proposed cross section consist of one inner 12-foot wide travel lane and one 14-foot wide outside travel lane. The additional width of the outside lane can accommodate bicycle traffic; however, there is also a 10-foot wide multi-use path proposed along the north side of a portion of the roadway from NC 55 westward to the future Highcroft Drive Extension. A five-foot wide sidewalk is proposed along both sides of the remainder of the roadway; where the multi-use path is on the north side, a five-foot sidewalk would be constructed on the south side. The proposed speed limit along the roadway is 45 miles per hour. The proposed design speed will be 50 miles per hour.

Traffic noise impacts and temporary construction noise impacts can be a consequence of transportation projects. This Traffic Noise Analysis utilized computer models created with the FHWA Traffic Noise Model software (TNM 2.5) to predict future noise levels and define impacted receptors along the proposed widening project. Based on the results of this analysis, multiple residences will be impacted by the proposed project and a traffic noise abatement

barrier preliminarily meets the NCDOT Traffic Noise Abatement Policy feasibility and reasonableness criteria. This Traffic Noise Analysis presents a detailed analysis of the noise impacts associated with this project as well as potential noise abatement measures to mitigate these impacts.

2.0 PROCEDURE

This Traffic Noise Analysis represents the preliminary analyses of the probable traffic noise impacts of the Morrisville Parkway Extension and NC 540 interchange project (TIP U-5315).

In accordance with NCDOT Traffic Noise Analysis and Abatement Manual, this Traffic Noise Analysis utilized validated computer models created with the FHWA Traffic Noise Model software (TNM 2.5) to predict future noise levels and define impacted receptors along the proposed widening project.

3.0 CHARACTERSITICS OF NOISE

Noise is basically defined as unwanted sound. It is emitted from many natural and man-made sources. Highway traffic noise is usually a composite of noises from engine exhaust, drive train, and tire-roadway interaction.

The magnitude of noise is usually described by a ratio of its sound pressure to a reference sound pressure, which is usually twenty micro-Pascals (20μPa). Since the range of sound pressure ratios varies greatly – over many orders of magnitude, a base-10 logarithmic scale is used to express sound levels in dimensionless units of decibels (dB). The commonly accepted limits of detectable human hearing sound magnitudes is between the threshold of hearing at 0 decibels and the threshold of pain at 140 decibels.

Sound frequencies are represented in units of Hertz (Hz), which correspond to the number of vibrations per second of a given tone. A cumulative 'sound level' is equivalent to ten times the base-10 logarithm of the ratio of the sum of the sound pressures of all frequencies to the reference sound pressure. To simplify the mathematical process of determining sound levels, sound frequencies are grouped into ranges, or 'bands.' Sound levels are then calculated by adding the cumulative sound pressure levels within each band – which are typically defined as one 'octave' or '1/3 octave' of the sound frequency spectrum.

The commonly accepted limitation of human hearing to detect sound frequencies is between 20 Hz and 20,000 Hz, and human hearing is most sensitive to the frequencies between 1,000 Hz – 6,000 Hz. Although people are generally not as sensitive to lower-frequency sounds as they are to higher frequencies, most people lose the ability to hear high-frequency sounds as they age. To accommodate varying receptor sensitivities, frequency sound levels are commonly adjusted, or 'filtered', before being logarithmically added and reported as a single 'sound level' magnitude of that filtering scale. The 'A-weighted' decibel filtering scale applies numerical adjustments to sound frequencies to emphasize the frequencies at which human hearing is sensitive, and to minimize the frequencies to which human hearing is not as sensitive (refer to Table 1).

Table 1 Comparison: Flat vs. A-Weighted Frequency Scaling

Octave-Band Center Frequency (Hz)	A-Weighted Adjustment[1]	Sample Frequency Sound Levels (Flat)	Sample Frequency Sound Levels (A-Weighted)
31	-39.53	90.00	50.47
63	-26.22	80.00	53.78
125	-16.19	70.00	53.81
250	-8.68	65.00	56.32
500	-3.25	60.00	56.75
1000	0.00	60.00	60.00
2000	+1.20	60.00	61.20
4000	+0.96	55.00	55.96
8000	-1.14	50.00	48.86
16000	-6.7	45.00	38.30
	Overall Sound Levels:	**90.48 dB[2]**	**66.32 dB(A)[2]**

1. Based on the ISO 226:2003 standard for normal equal-loudness contours, the A-weighted decibel network filtering scale is defined for a frequency, f, by the equation: $20 \times \log_{10} (A(f) / A(1000))$, where $A(f) = [12{,}200^2 \times f^4] / [(f^2 + 20.6^2) \times (f^2 + 12{,}200^2) \times (f^2 + 107.7^2)^{0.5} \times (f^2 + 737.9^2)^{0.5}]$.
2. Although the energy in the flat sound source would create an *actual* sound level = 90.48 dB, it would be *perceived* as a sound level of 66.32 dB(A) by human hearing due to the decreased sensitivity of human hearing to lower sound frequencies.

Several examples of noise levels expressed in dB(A) are listed in Table 2. As shown in Table 2, most individuals are exposed to fairly high noise levels from many sources on a regular basis. In order to perceive sounds of greatly varying pressure levels, human hearing has a non-linear sensitivity to sound pressure exposure. For example, doubling the sound pressure results in a three decibel change in the noise level; however, variations of three decibels (3 dB(A)) or less are commonly considered "barely perceptible" to normal human hearing. A five decibel (5 dB(A)) change is more readily noticeable. By definition, a ten-fold increase in the sound pressure level correlates to a 10 decibel (10 dB(A)) noise level increase; however, it is judged by most people as only a doubling of the loudness – sounding "twice as loud".

The degree of disturbance or annoyance from exposure to unwanted sound – noise – depends upon three factors:

1. The amount, nature, and duration of the intruding noise
2. The relationship between the intruding noise and the existing (ambient) sound environment; and
3. The situation in which the disturbing noise is heard

In considering the first of these factors, it is important to note that individuals have varying sensitivity to noise. Loud noises bother some people more than other people. The time patterns and durations of noise(s) also affect perception as to whether or not it is offensive. For example, noises that occur during nighttime (sleeping) hours are typically considered to be more offensive than the same noises in the daytime.

Table 2 Common Indoor and Outdoor Noise Levels

Common Outdoor Noise Levels	Noise Level (dB(A))	Common Indoor Noise Levels
	110	Rock Band
Jet Flyover at 1,000 feet	100	Inside Subway Train (NY)
Gas Lawn Mower at 3 feet		
Diesel Truck at 50 feet	90	Food Blender at 3 feet
Noisy Urban Daytime	80	Garbage Disposal at 3 feet
Gas Lawn Mower at 100 feet	70	Vacuum Cleaner at 10 feet
Commercial Area		Normal Speech at 3 feet
	60	
		Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
	30	
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (Background)
	20	
		Broadcast and Recording Studio
	10	
	0	Threshold of Hearing

Adapted from Guide on Evaluation and Attenuation of Traffic Noise, American Association of State Highway and Transportation Officials (AASHTO). 1974 (revised 1993).

With regard to the second factor, individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). A car horn blowing at night when background noise levels are low would generally be more objectionable than one blowing in the afternoon when background noise levels are typically higher. The response to noise stimulus is analogous to the response to turning on an interior light. During the daytime an illuminated bulb simply adds to the ambient light, but when eyes are conditioned to the dark of night, a suddenly illuminated bulb can be temporarily blinding.

The third factor – situational noise – is related to the interference of noise with activities of individuals. In a 60 dB(A) environment such as is commonly found in a large business office, normal conversation would be possible, while sleep might be difficult. Loud noises may easily interrupt activities that require a quiet setting for greater mental concentration or rest; however, the same loud noises may not interrupt activities requiring less mental focus or tranquility.

Over time, individuals tend to accept the noises that intrude into their lives on a regular basis. However, exposure to prolonged and/or extremely loud noise(s) can prevent use of exterior and interior spaces, and has been theorized to pose health risks. Appropriately, regulations exist for noise control or mitigation from many particularly offensive sources, including airplanes, factories, railroads, and highways. For all "Type I" federal, state, or federal-aid highway projects in the State of North Carolina, traffic and construction noise impact analysis and mitigation assessment is dictated by the applicable North Carolina Department of Transportation Traffic Noise Abatement Policy.

4.0 NOISE ABATEMENT CRITERIA

4.1 Title 23 Code of Federal Regulations, Part 772 (23 CFR 772)

The Federal Highway Administration (FHWA) has developed Noise Abatement Criteria (NAC) and procedures to be used in the planning and design of highways. The purpose of 23 CFR, Part 772 is:

> …to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways approved pursuant to Title 23 United States Code (U.S.C.).

The abatement criteria and procedures are set forth in Title 23 CFR Part 772, which also states:

> …in determining and abating traffic noise impacts, primary consideration is to be given to exterior areas. Abatement will usually be necessary only where frequent human use occurs and a lowered noise level would be of benefit.

A summary of the NAC for various land uses is presented in Table 3: Noise Abatement Criteria. The L_{eq}, or equivalent sound level, is the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as a time-varying sound level during the same period. With regard to traffic noise, fluctuating sound levels of traffic noise are represented in terms of L_{eq}, the steady, or 'equivalent', noise level with the same energy.

4.2 North Carolina Department of Transportation Traffic Noise Abatement Policy

The North Carolina Department of Transportation Traffic Noise Abatement Policy effective July 13, 2011 establishes official policy on highway noise. This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures and the equitable and cost-effective expenditure of public funds for traffic noise abatement. Where the FHWA has given highway agencies flexibility in implementing the 23 CFR 772 standards, this policy describes the NCDOT approach to implementation. This policy is included as Appendix A of this report.

4.3 Noise Abatement Criteria

The two categories of traffic noise impacts are defined as 1) those that "approach" or exceed the FHWA Noise Abatement Criteria (NAC), as shown in Table 3, and 2) those that represent a "substantial increase" over existing noise levels as defined by NCDOT. An impact that

represents a "substantial increase" is based on a comparison of the existing noise level [Leq(h)] to the predicted increased noise levels with respect to a change in noise levels in the design year of between 10 and 15 dB(A) or more, as shown in Table 4.

Table 3 Noise Abatement Criteria

Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))			
Activity Category	**Activity Criteria[1] $L_{eq(h)}$[2]**	**Evaluation Location**	**Activity Description**
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B [3]	67	Exterior	Residential
C [3]	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section4(f) sites, schools, television studios, trails, and trail crossings
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E [3]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

[1] The $L_{eq(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

[2] The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq(h)}$ being the hourly value of L_{eq}.

[3] Includes undeveloped lands permitted for this activity category.

Table 4 NCDOT "Substantial Increase" Noise Impact Criteria

Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))	
Existing Noise Level[1] ($L_{eq(h)}$)	**Predicted Design Year Noise Level Increase[2] ($L_{eq(h)}$)**
50 or less	15 or more
51	14 or more
52	13 or more
53	12 or more
54	11 or more
55 or more	10 or more

[1] Loudest hourly equivalent noise level from the combination of natural and mechanical sources and human activity usually present in a particular area.

[2] Predicted hourly equivalent Design Year traffic noise level minus existing noise level.

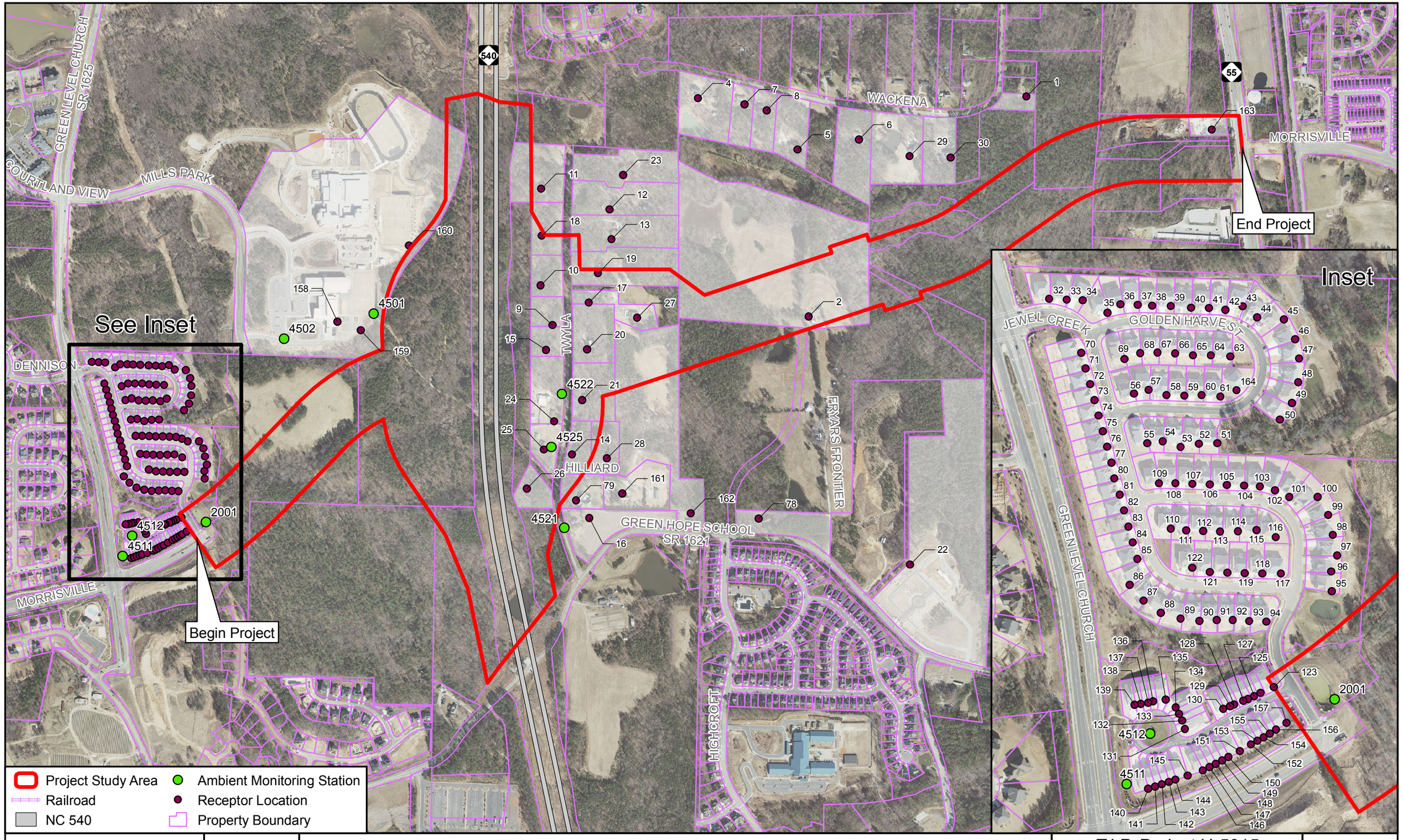
5.0 AMBIENT NOISE LEVELS

Ambient noise is that noise which is all around us, caused by natural and manmade events. It includes the wind, rain, thunder, birds chirping, insects, household appliances, commercial operations, lawn mowers, airplanes, automobiles, etc. It is all noise that is present in a particular area.

NC 540 opened to traffic on August 2, 2012, which is after the data collection date. While the base year model does not reflect this facility, the No-Build model includes NC 540 and its projected future year volumes.

Ambient noise monitoring data was collected at eight locations in conjunction with this traffic noise analysis. The loudest-hour existing noise levels were assessed as the TNM-predicted noise levels based on existing loudest-hour traffic estimates, or the ambient noise levels obtained at representative locations in the field.[1] Figure 2 illustrates the ambient monitoring locations as well as the various receptors incorporated into this analysis. Appendix B contains the ambient noise level monitoring field notes and Appendix C details the hourly equivalent traffic noise level tables.

[1] Per 23 CFR 772.5, existing noise levels are defined as "the worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area." If the TNM-predicted existing loudest-hour *traffic* noise levels are lower than the hourly-equivalent noise levels obtained in the field, then existing noise levels are assessed as the latter.



Ambient Monitoring and Receptor Location Map

Prepared by: M/A/B

T.I.P. Project U-5315
Morrisville Parkway Extension
and NC 540 Interchange
Cary, NC

Figure
2

6.0 PROCEDURE FOR PREDICTING FUTURE NOISE LEVELS

Traffic noise emission is composed of several variables, including the number, types, and travel speeds of the vehicles, as well as the geometry of the roadway(s) on which the vehicles travel. Additionally, variables such as weather and intervening topography affect the transmission of traffic noise from the vehicle(s) to noise sensitive receptors.

In accordance with industry standards and accepted best-practices, detailed computer models were created using the Federal Highway Administration Traffic Noise Model® (FHWA TNM v.2.5). The computer models were validated to within acceptable tolerances of field-monitored traffic noise data, and were used to predict traffic noise levels for receptor locations in the vicinity of the Morrisville Parkway Extension and NC 540 interchange project. Traffic noise consists of three primary parts: tire noise, engine noise, and exhaust noise. Of these sources, tire noise is typically the most offensive at unimpeded travel speeds. Sporadic traffic noises such as horns, squealing brakes, screeching tires, etc. are considered aberrant and are not included within the predictive model algorithm. Traffic noise is not constant; it varies in time depending upon the number, speed, type, and frequency of vehicles that pass by a given receptor. Furthermore, since traffic noise emissions are different for various types of vehicles, the TNM algorithm distinguishes between the source emissions from the following vehicle types: automobiles, medium trucks, heavy trucks, buses, and motorcycles, as shown in Table 5. The computer traffic noise prediction model uses the number and type of vehicles on the planned roadway, vehicle speeds, the physical characteristics of the road (curves, hills, depressions, elevations, etc.), receptor location and height, and, if applicable, barrier type, barrier ground elevation, and barrier segment top elevations.

Table 5 Traffic Noise Model (TNM) Vehicle Classification Types

TNM Vehicle Type	Description
Autos	All vehicles with two axles and four tires, including passenger cars and light trucks, weighing 10,000 pounds or less
Medium Trucks	All vehicles having two axles and six tires, weighing between 10,000 and 26,000 pounds
Heavy Trucks	All vehicles having three or more axles, weighing more than 26,000 pounds
Buses	All vehicles designed to carry more than nine passengers
Motorcycles	All vehicles with two or three tires and an open-air driver / passenger compartment

Sources: FHWA Measurement of Highway-Related Noise, § 5.1.3 Vehicle Types.
FHWA Traffic Monitoring Guide, § 4.1 Classification Schemes

Preliminary project plans of the considered design alternative were used in this traffic noise analysis. Per FHWA guidance, the predictions documented in this report are based upon the project Design Year 2035 build-condition traffic conditions (including horizontal alignment

alternatives) resulting in the loudest predicted hourly-equivalent traffic noise levels for each receptor. Refer to Appendix D for the traffic forecast volumes utilized for this analysis and Appendix E for a comprehensive list of traffic noise level receptors, and existing and predicted Design Year 2035 hourly equivalent traffic noise levels. Appendix F contains illustrations of the Traffic Noise Model.

7.0 TRAFFIC NOISE IMPACTS

Traffic noise impacts occur when the predicted traffic noise levels either: [a] approach or exceed the FHWA noise abatement criteria (with "approach" meaning within 1 dB(A) of the NAC values listed in Table 3 on page 6), or [b] substantially exceed the existing noise levels (refer to Table 4). FHWA and NCDOT require that feasible and reasonable measures be considered to abate traffic noise at all predicted traffic noise impacts. Measures considered include highway alignment selection, traffic systems management, buffer zones, noise walls, and earth berms.

Traffic noise is predicted to create nine traffic noise impacts due to predicted design year 2035 build-condition noise levels that will approach or exceed FHWA noise abatement criteria. The number and types of predicted traffic noise impacts from the project is shown in Table 6, with impacts delineated as either approaching or exceeding the FHWA NAC, by a substantial increase in Design Year 2035 build-condition traffic noise levels over existing ambient noise levels, or by meeting both criteria.

Table 6 Traffic Noise Impact Summary

Alternative	Approximate number of Impacted Receptors Approaching or Exceeding FHWA NAC[1]							Substantial Noise Level Increase[2]	Impacts Due to Both Criteria[3]	Total Impacts per 23 CFR 772[4]
	A	B	C	D	E	F	G			
Existing	0	0	0	0	0	0	0	N/A	N/A	0
No-Build	0	4	0	0	0	0	0	5	3	5
Build	0	9	0	0	0	0	0	9	9	9

1. Predicted traffic noise level impact due to approaching or exceeding NAC (refer to Table 3, pg 7).
2. Predicted "substantial increase" traffic noise level impact (refer to Table 4, pg 8).
3. Predicted traffic noise level impact due to exceeding NAC *and* "substantial increase" in build-condition noise levels.
4. The total number of predicted impacts is not duplicated if receptors are predicted to be impacted by more than one criterion.

Predicted build-condition traffic noise level contours are not a definitive means by which to assess traffic noise level impacts; however, they can aid in future land use planning efforts in presently undeveloped areas.

8.0 POTENTIAL TRAFFIC NOISE ABATEMENT MEASURES

Per NCDOT Policy, the following traffic noise abatement measures were considered: highway alignment selection, traffic systems management, buffer zones, noise barriers (earth berms and noise walls), and noise insulation of Activity Category D land use facilities.

8.1 Highway Alignment Selection

Highway alignment selection for traffic noise abatement measures involves modifying the horizontal and vertical geometry of the proposed facility to minimize traffic noise to noise-sensitive receptors. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of locating the roadway at a sufficient distance from noise sensitive receptors. Appreciable reductions in traffic noise transmissions to sensitive receptors can be made by adjusting the vertical highway alignment and/or section geometry. For example, lowering a roadway below existing grade creates a cut section which could act similarly as an earth berm, depending upon the relative location(s) of noise-sensitive receptor(s). The impacted receptors are along a portion of Morrisville Parkway that has already been constructed and is presently in place. As a result, any alignment changes to the interchange or future Morrisville Parkway extension will have minimal impact to these receptors, which are located to the west of the new construction.

8.2 Traffic Systems Management Measures

Traffic management measures such as prohibition of truck traffic, lowering speed limits, limiting of traffic volumes, and/or limiting time of operation were considered as possible traffic noise impact abatement measures. The purpose of the project is to increase the connectivity of the area and provide additional network capacity. Prohibition of truck traffic, reduction of the speed limit below the proposed 45 miles per hour, or screening total traffic volumes would diminish the functional capacity of the highway facility and are not considered practicable abatement measures.

8.3 Buffer Zones

Buffer zones are typically not practical and/or cost effective for noise mitigation due to the substantial amount of right-of-way required, and would not be a feasible noise mitigation measure for this project. Furthermore, if the acquisition of a suitable buffer zone had been feasible, the associated costs would likely exceed the NCDOT Policy reasonable abatement cost threshold per benefited receptor.

8.4 Noise Barriers

Passive noise abatement measures are effective because they absorb sound energy, extend the source-to-receptor sound transmission path, or both. Sound absorption is a function of abatement medium (e.g. earth berms absorb more sound energy than noise walls of the same height because earth berms are more massive). The source-to-receptor path is extended by placement of an obstacle, such as a wall, that sufficiently blocks the transmission of sound waves that travel from the source to the receptor.

Highway sound barriers are primarily constructed as earth berms or solid-mass walls adjacent to limited-access freeways that are in close proximity to noise-sensitive land use(s). To be effective, a sound barrier must be long enough and tall enough to shield the impacted receptor(s). Generally, the noise wall length must be eight times the distance from the barrier to the receptor. For example, if a receptor is 200 feet from the roadway, an effective barrier would be approximately 1,600 feet long – with the receptor in the horizontal center. On roadway facilities with direct access for driveways, sound barriers are typically not feasible because the openings render the barrier ineffective in impeding the transmission of traffic noise. Due to the requisite lengths for effectiveness, sound barriers are typically not economical for isolated or most low-density areas. However, sound barriers may be economical for the benefit of as few as one predicted traffic noise impact if the barrier can benefit enough total receptors – impacted and non-impacted combined – to meet applicable reasonableness criteria.

Based upon the preliminary design of the Morrisville Parkway Extension and NC 540 Interchange, one noise barrier meets applicable feasibility and reasonableness criteria, and is recommended for detailed analysis for the benefit of the predicted traffic noise impacts in the vicinity of the project (refer to Appendix E).

-NW1-: Adjacent to the Morrisville Parkway westbound lanes, in the northeast quadrant of the Green Level Church Road at Morrisville Parkway intersection. The optimized –NW1- sound barrier design is 720 feet long, ranges from 8 feet to 15 feet, with a total area of 9,361 square feet. The barrier is predicted to benefit 21 receptors, including all 9 predicted impacts. The 446 square feet per benefit is less than the maximum allowable 2,955 square feet per benefit. The sound barrier is predicted to provide at least a 7-decibel (7 dB(A)) noise level reduction for 16 first-row receptors.

8.5 Noise Insulation

Since no traffic noise impacts for the Morrisville Parkway Extension and NC 540 Interchange project are predicted to occur for interior noise-sensitive areas (NAC "D"), interior noise insulation was not considered as a potential traffic noise impact mitigation measure as part of the analysis for this Design Noise Report.

9.0 FEASIBILITY AND REASONABLENESS DETERMINATION

FHWA and NCDOT require that feasible and reasonable noise abatement measures be considered and evaluated for the benefit of all predicted build-condition traffic noise impacts. Feasibility and reasonableness are distinct and separate considerations. In accordance with the 2011 NCDOT Traffic Noise Abatement Policy, one noise barrier meets feasibility and reasonableness requirements, and subsequent to completion of the project design and the public involvement process, would be recommended for construction.

Feasibility is the consideration as to whether noise abatement measures can be implemented. Reasonableness is the consideration as to whether noise abatement measures should be implemented. All of the following conditions regarding feasibility and reasonableness must be met in order for noise abatement to be justified and incorporated into project design, as

applicable. Failure to achieve any single element of feasibility or reasonableness will result in the noise abatement measure being deemed not feasible or not reasonable, whichever applies.

Feasibility

The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

a) Any receptor that receives a minimum noise level reduction of five dB(A) due to noise abatement measures shall be considered a benefited receptor. Noise reduction of five dB(A) must be achieved for at least one impacted receptor.
b) Engineering feasibility of the noise abatement measure(s) shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

The TNM analysis indicated that 21 receptors would receive a minimum noise level reduction of five dB(A).

Reasonableness

The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

a) Viewpoints of the property owners and residents of all benefited receptors shall be solicited. One owner ballot and one resident ballot shall be solicited for each benefited receptor. Points per ballot shall be distributed in the following weighted manner:
   - 3 points/ballot for benefited front row property owners
   - 1 point/ballot for all other benefited property owners
   - 1 point/ballot vote for all residents

   Consideration of the noise abatement measure will continue unless a simple majority of all distributed points are returned that indicates the balloted voters do not want the abatement measure.
b) The maximum allowable base quantity of noise walls and/or earthen berms per benefited receptor shall not exceed 2,500 ft^2 and 7,000 yd^3, respectively. Additionally, an incremental increase of 35 ft^2 for noise walls and 100 yd^3 for earthen berms shall be added to the base quantity per the average increase in dB(A) between existing and predicted exterior noise levels of all impacted receptors within each noise sensitive area, which is defined as a group of receptors that are exposed to similar noise sources. A base dollar value of $37,500 plus an incremental increase of $525 (as defined above) shall be used to determine reasonableness of buffer zones and noise insulation.
c) A noise reduction design goal of at least 7 dB(A) must be evaluated for all front row receptors. At least one benefited front row receptor must achieve the noise reduction design goal of 7 dB(A) to indicate the noise abatement measure effectively reduces traffic noise.

The nine impacted receptors have an average 13 dB(A) increase between existing and predicted noise levels. As a result, the maximum allowable base quantity must not exceed 2,500 square

feet plus the incremental 35 square feet for each of the 13 dB(A) increases, or 2,955 square feet. The TNM analysis indicated that 16 front row receptors would receive a 7 dB(A) reduction with a barrier square footage per benefited receptor below the 2,955 square foot threshold.

10.0 CONSTRUCTION NOISE

The predominant construction activities associated with this project are expected to be earth removal, hauling, grading, and paving. Temporary and localized construction noise impacts will likely occur as a result of these activities. During daytime hours, the predicted effects of these impacts will be temporary speech interference for passers-by and those individuals living or working near the project. During evening and nighttime hours, steady-state construction noise emissions such as from paving operations will be audible, and may cause impacts to activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions such as from backup alarms, lift gate closures ("slamming" of dump truck gates), etc., will be perceived as distinctly louder than the steady-state acoustic environment, and will likely cause severe impacts to the general peace and usage of noise-sensitive areas – particularly residences.

Extremely loud construction noise activities such as usage of pile-drivers and impact-hammers (jack hammer, hoe-ram) will provide sporadic and temporary construction noise impacts in the near vicinity of those activities (refer to Table 7). Although a two-lane bridge currently exists over NC 540, a second bridge will eventually be constructed, which could require the use of pile-drivers and impact-hammers. Mills Park Elementary School is located approximately 1,050 feet from this proposed bridge. Based on typical noise levels for these devices and typical point source divergence rates, the sound level could be 80 dB(A) at the building. Assuming a 30 dB(A) Sound Transmission Class (STC) rating of the building, the interior noise level would be 50 dB(A). This noise level would be noticeable within the building, however should not create interior speech intelligibility issues. It is the recommendation of this Traffic Noise Analysis that construction activities that will produce extremely loud noises be scheduled during times of the day when such noises will create as minimal disturbance as possible to the school and adjacent residences.

Generally, low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent possible. These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-road locations, elimination of "tail gate banging", ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

While discrete construction noise level prediction is difficult for a particular receiver or group of receivers, it can be assessed in a general capacity with respect to distance from known or likely project activities. For this project, earth removal, grading, hauling, and paving is anticipated to occur in the near vicinity of numerous noise-sensitive receptors. Although construction noise impact mitigation should not place an undue burden upon the financial cost of the project or the project construction schedule, pursuant to the requirements of 23 CFR 772.19, it is the recommendation of this traffic noise analysis that:

- Earth removal, grading, hauling, and paving activities in the vicinity of residences should be limited to weekday daytime hours.

Table 7 Construction Equipment Typical Noise Level Emissions[1]

Equipment	Noise Level Emissions (dB(A)) at 50 Feet From Equipment[2]
	70 80 90 100
Pile Driver[3]	
Jack Hammer	
Tractor	
Road Grader	
Backhoe	
Truck	
Paver	
Pneumatic Wrench	
Crane	
Concrete Mixer	
Compressor	
Front-End Loader	
Generator	
Saws	
Roller (Compactor)	

1. Adapted from *Noise Construction Equipment and Operations, Building Equipment, and Home Appliances*. U.S. Environmental Protection Agency. Washington D.C. 1971.
2. Cited noise level ranges are typical for the equipment cited. Noise energy dissipates as a function of distance between the source and the receptor. For example, if the noise level from a pile driver at a distance of 50 feet = 100 decibels (dB(A)), then at 400 feet, it might be 82 decibels (dB(A)) or less.
3. Due to project safety and potential construction noise concerns, pile driving activities are typically limited to daytime hours.

- If meeting the project schedule requires that earth removal, grading, hauling and / or paving must occur during evening, nighttime and / or weekend hours in the vicinity of residences neighborhoods, the Contractor shall notify NCDOT as soon as possible. In such instance(s), all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise impacts upon the affected property owners and / or residents.
- If construction noise activities must occur during context-sensitive hours in the vicinity of noise-sensitive areas, discrete construction noise abatement measures including, but not

limited to portable noise barriers and / or other equipment-quieting devices shall be considered.

- Some construction activities will create extreme noise impacts for nearby noise-sensitive land uses. For example, pile driving activities will pose an extreme noise impact for distances of up to one-quarter mile. It is the recommendation of this traffic noise analysis that considerations be made for any nearby residences for all evening and/or nighttime periods (7:00 p.m. – 7:00 a.m.) throughout which extremely loud construction activities might occur.

For additional information on construction noise, please refer to the FHWA Construction Noise Handbook (FHWA-HEP-06-015) and the Roadway Construction Noise Model (RCNM), available online at: http://www.fhwa.dot.gov/environment/noise/cnstr_ns.htm.

11.0 NOISE COMPATIBLE LAND USE

One of the most effective means to prevent future traffic noise impacts is noise-sensitive land-use development. The compatibility of highways and neighboring local areas is essential for continued growth, and can be achieved if local governments and developers require and practice noise-sensitive land-use planning.

Although regulation of land use is not within the purview of FHWA or NCDOT, some widely accepted techniques for noise-sensitive land use planning in the vicinity of existing and proposed highway facilities include:

- Locating commercial, industrial, recreational, and other noise-compatible land-uses adjacent to highways

- Incorporating effective traffic noise mitigating features, such as earth berms and solid-mass noise walls, as part of residential developments

- Utilization of noise-sensitive architectural design and site planning, such as the orientation of quiet spaces away from roadways

- Required use of sound insulating building materials and construction methods

As indicated in the July 2011 NCDOT Traffic Noise Abatement Policy, local jurisdictions with zoning control should use the information contained in this report to develop policies and/or ordinances to limit the growth of noise-sensitive land uses located adjacent to roadways. Furthermore, NCDOT encourages the dissemination of this information to all people who may be affected by, or who might influence others affected by, traffic noise.

12.0 CONCLUSION

Traffic noise and temporary construction noise can be a consequence of transportation projects, especially in areas in close proximity to high-volume and high-speed existing steady-state traffic noise sources. This Traffic Noise Analysis utilized computer models created using TNM 2.5,

validated to field-collected traffic noise monitoring data, to predict future noise levels and define impacted receptors along the proposed new roadway project.

Existing traffic noise impacts no receptors in the vicinity of the proposed Morrisville Parkway Extension and NC 540 interchange project. For design year 2035 traffic volumes, the no-build condition is predicted to create four traffic noise impacts; the build condition is predicted to create nine traffic noise impacts. Additionally, Design Year (2035) Build condition traffic noise impacts were predicted for five receptors presently considered as likely to be acquired for project right-of-way. The status of these five potential noise impacts is recommended to be reviewed subject to the project final design.

Consideration for noise abatement measures was given to all impacted receptors. Traffic noise abatement measures are preliminarily considered to be feasible and reasonable for the benefit of predicted traffic noise impacts in the vicinity of the Morrisville Parkway Extension and NC 540 Interchange project. Furthermore, construction noise impacts – some of them potentially extreme – may occur due to the close proximity of numerous noise-sensitive receptors to project construction activities.

The recommendations of this traffic noise analysis are that all reasonable efforts should be made to minimize exposure of noise-sensitive areas to construction noise impacts, and that a detailed analysis of traffic noise abatement measures be completed in a Design Noise Report subsequent to project final design. In accordance with the 2011 NCDOT Traffic Noise Abatement Policy, one noise barrier meets feasibility and reasonableness requirements, and subsequent to completion of the project design and the public involvement process, is recommended for construction.

VHB+M/A/B | Joining Forces
VHB Engineering NC, P.C.
4000 WestChase Boulevard, Suite 530
Raleigh, NC 27607
919.829.0328 • Fax 919.829.0329
www.vhb.com

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Memorandum

To: Todd Delk, P.E.
Project Engineer
Town of Cary Engineering Dept.

Date: October 17, 2013

Project No.: 38300.00

From: Lauren Triebert, P.E.
Transportation Engineer
VHB NC, P.C.

Re: Morrisville Parkway Extension/NC 540 Interchange EA/FONSI – Noise Analysis Update

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Since the original noise measurements were taken for the Traffic Noise Analysis for the Morrisville Parkway Extension and NC 540 Interchange project, NC 540 has opened in the vicinity of the referenced project. This memo serves to update the previously completed noise analysis based on new ambient noise measurements taken after the opening of NC 540.

Seven (7) short term and one (1) long term traffic noise readings were originally taken May 31-June 1, 2012. Each of these measurements was taken again at the original locations after NC 540 was opened. The new measurements were then compared to the original readings and a review of impacts was completed.

The long term reading is used to determine adjustment factors that should be applied to the short term readings to account for hourly variations in sound throughout the day. The long term reading was taken at a slightly different location because the original location is now within a construction zone and would have notably higher readings than the original data. Also, a new reading at the original location would likely have multiple atypical spikes in the measurements attributable to construction equipment; thus the location was determined to be ineffective for a long-term reading. Because the long term reading is used only to normalize the hourly variations throughout the day, it is not critical that this reading be taken at the exact location as the previous reading.

Attached to this memo is a table comparing the original readings to the updated measurements. The updated measurements are 1-4 decibels (dB) higher than the original readings, depending on their proximity to NC 540.

The increases seen at the short term monitoring locations are in line with what was expected to occur, as there is a substantial amount of new traffic on NC 540 that was not originally recorded. A comparison of the original and updated traffic noise readings are attached.

The long-term reading registers as lower than the original measurement, but this is because of the change in monitoring location. As mentioned previously, this reading is used only to normalize the daily variations, resulting in hourly adjustment factors. Thus, a comparison of the long term readings does not provide a useful comparison.

Theoretically, a traffic noise impact occurs when one of two, or both, impact criteria thresholds set by NCDOT are met. The two categories of traffic noise impact are defined as 1) those that “approach” or exceed the FHWA Noise Abatement Criteria (NAC) and 2) those that represent a “substantial increase” over existing noise levels as defined by NCDOT.

In the original analysis, there were determined to be nine (9) traffic noise impacts, all of which were located along Indigo Ridge Place. As shown in the attached table, the ambient levels in this area (Setup 4512, Indigo Ridge Place Loop) increased to 54 dB (58 dB, adjusted), which is still below the NAC for residential areas (67 dB). Thus there are no additional impacts due to ambient noise levels.

Because the existing sound level has increased since the opening of NC 540, the criteria of a "substantial increase" over existing levels (i.e. a 10 dB increase for this area) would actually require higher noise levels from TNM to maintain the same number of impacts as previously reported. Only 2 of the 9 original impacts are still considered impacts when using this criteria, while 7 no longer meet this threshold.

However, the total number of impacts remains at 9 since all 9 original impacts still meet the first criteria of approaching or exceeding the FHWA NAC. The original analysis results and recommendations are still applicable with no revisions necessary to the draft Environmental Assessment section addressing traffic noise impacts.

If there are any questions regarding the updated analysis or any additional information is needed, please contact me (ltriebert@vhb.com, 919.829.0328 ext. 5643) or Andrew Topp (atopp@vhb.com, 919-334-5620).

Attachments:

Noise Reading Comparison Table

Revised Analysis Results Table (originally Appendix E in TNM Report)

Ambient Monitoring Sites Comparison

				Orinigal Noise Data - May/June 2012				Revised Noise Data - October 2013				
Setup	**Location**	**Land Use**	**Roadway Noise Source2**	**Start/Stop Time**	**Leq(h) (dB(A))**	**Leq(h) Adjust**	**Leq(h) (dB(A))**	**Start/Stop Time**	**Leq(h) (dB(A))**	**Leq(h) Adjust**	**Leq(h) (dB(A))**	**Adjusted Difference**
2001	NE corner of Morrisville Parkway and Westfalen Drive (long-term reading)	Residential	Morrisville Parkway	5:51 AM / 6:06 PM	49	4	53	8:08 AM / 3:14 PM	44	4	48	**-5**
4501	Mills Park Elementary Playground	Institutional	Human Activity	1:14 PM / 1:49 PM	64	0	64	1:12 PM / 1:49 PM	66	4	66	**2**
4502	Mills Park Elementary Parking Lot	Institutional	Human Activity	1:59 PM / 2:30 PM	51	3	54	4:16 PM / 4:48 PM	52	3	55	**1**
4511	NE Corner of Green Level Church Road and Morrisville Parkway	Residential	Green Level Church Road Morrisville Parkway	1:02 PM / 1:36 PM	60	3	63	2:45 PM / 3:18 PM	64	3	67	**4**
4512	Indigo Ridge Place Loop	Residential	Green Level Church Road, Morrisville Parkway	1:03 PM / 1:35 PM	53	3	56	2:45 PM / 3:19 PM	54	4	58	**2**
4521	909 Twyla Drive - (South-Baptist Church)	Residential	Green Hope School Road, Twyla Road	3:01 PM / 3:32 PM	53	4	57	10:59 AM / 11:31 AM	57	0	57	**0**
4522	1013 Twyla Drive (North-Residence)	Residential	Twyla Road	3:38 PM / 4:21 PM	50	4	54	10:19 AM / 10:51 AM	53	2	55	**1**
4525	1003 Twyla Drive (Middle-Residence)	Residential	Twyla Road	4:25 PM / 4:57 PM	46	7	53	11:02 AM / 11:35 AM	54	0	54	**1**

		161					
No.	Address	Dus	USAGE	NAC	x(ft)	y(ft)	z(ft)
1	1708 WACKENA RD	1	Residence	B	2,036,079.41	751,510.27	352.0
2	201 FRYARS FRONTIER TRL	1	Residence	B	2,034,401.31	749,814.79	366.0
4	1404 WACKENA RD	1	Residence	B	2,033,548.85	751,498.16	310.0
5	1512 WACKENA RD	1	Residence	B	2,034,314.57	751,102.32	314.0
6	1616 WACKENA RD	1	Residence	B	2,034,789.02	751,179.16	338.0
7	1500 WACKENA RD	1	Residence	B	2,033,906.10	751,450.89	324.0
8	1504 WACKENA RD	1	Residence	B	2,034,076.38	751,403.97	332.0
9	1105 TWYLA RD	1	Residence	B	2,032,426.31	749,748.40	322.0
10	1117 TWYLA RD	1	Residence	B	2,032,334.50	750,056.57	316.0
11	1145 TWYLA RD	1	Residence	B	2,032,339.04	750,799.88	306.0
12	1140 TWYLA RD	1	Residence	B	2,032,865.26	750,640.73	312.0
13	1128 TWYLA RD	1	Residence	B	2,032,882.03	750,410.21	320.0
14	1004 TWYLA RD	1	Residence	B	2,032,576.21	748,751.88	344.0
15	1101 TWYLA RD	1	Residence	B	2,032,376.12	749,557.22	332.0
16	910 TWYLA RD	1	Church	B	2,032,710.13	748,261.21	374.0
17	1112 TWYLA RD	1	Residence	B	2,032,706.59	749,921.61	320.0
18	1132 TWYLA RD	1	Residence	B	2,032,344.20	750,436.74	310.0
19	1120 TWYLA RD	1	Residence	B	2,032,777.52	750,148.07	322.0
20	1100 TWYLA RD	1	Residence	B	2,032,692.63	749,561.75	316.0
21	1016 TWYLA RD	1	Residence	B	2,032,653.85	749,171.69	332.0
22	0 GREEN HOPE SCHOOL RD	1	Residence	B	2,035,181.12	747,902.71	368.0
23	1148 TWYLA RD	1	Residence	B	2,032,971.31	750,906.61	292.0
24	1017 TWYLA RD	1	Residence	B	2,032,438.25	749,006.59	352.0
25	1005 TWYLA RD	1	Residence	B	2,032,358.67	748,789.74	354.0
26	921 TWYLA RD	1	Residence	B	2,032,227.90	748,489.50	352.0
27	1112 TWYLA RD	1	Residence	B	2,033,079.89	749,805.66	338.0
28	1000 TWYLA RD	1	Residence	B	2,032,845.75	748,721.26	348.0
29	1704 WACKENA RD	1	Residence	B	2,035,178.59	751,050.59	338.0
30	1624 WACKENA RD	1	Residence	B	2,035,495.09	751,039.36	331.0
32	1003 JEWEL CREEK DR	1	Residence	B	2,028,874.56	749,464.43	342.0
33	1005 JEWEL CREEK DR	1	Residence	B	2,028,929.08	749,461.70	341.0
34	1007 JEWEL CREEK DR	1	Residence	B	2,028,977.94	749,460.31	340.0
35	448 GOLDEN HARVEST LP	1	Residence	B	2,029,054.20	749,421.66	337.0
36	446 GOLDEN HARVEST LP	1	Residence	B	2,029,094.15	749,447.31	335.0
37	444 GOLDEN HARVEST LP	1	Residence	B	2,029,147.41	749,446.18	332.0
38	442 GOLDEN HARVEST LP	1	Residence	B	2,029,192.07	749,443.65	329.0
39	440 GOLDEN HARVEST LP	1	Residence	B	2,029,249.16	749,442.62	326.0
40	438 GOLDEN HARVEST LP	1	Residence	B	2,029,311.78	749,437.13	324.0
41	436 GOLDEN HARVEST LP	1	Residence	B	2,029,366.98	749,436.04	321.0
42	434 GOLDEN HARVEST LP	1	Residence	B	2,029,417.55	749,430.70	318.0
43	432 GOLDEN HARVEST LP	1	Residence	B	2,029,471.17	749,441.14	316.0
44	430 GOLDEN HARVEST LP	1	Residence	B	2,029,515.39	749,407.69	314.0
45	428 GOLDEN HARVEST LP	1	Residence	B	2,029,598.19	749,401.30	312.0
46	426 GOLDEN HARVEST LP	1	Residence	B	2,029,632.47	749,340.12	312.0
47	424 GOLDEN HARVEST LP	1	Residence	B	2,029,644.62	749,280.64	312.0
48	422 GOLDEN HARVEST LP	1	Residence	B	2,029,642.03	749,207.59	313.0
49	420 GOLDEN HARVEST LP	1	Residence	B	2,029,622.86	749,143.76	314.0
50	418 GOLDEN HARVEST LP	1	Residence	B	2,029,585.29	749,092.43	316.0
51	412 GOLDEN HARVEST LP	1	Residence	B	2,029,393.00	749,019.12	327.0
52	410 GOLDEN HARVEST LP	1	Residence	B	2,029,336.01	749,017.41	330.0
53	408 GOLDEN HARVEST LP	1	Residence	B	2,029,279.84	749,007.96	334.0
54	406 GOLDEN HARVEST LP	1	Residence	B	2,029,224.66	749,025.27	339.0
55	404 GOLDEN HARVEST LP	1	Residence	B	2,029,176.42	749,019.32	344.0
56	403 GOLDEN HARVEST LP	1	Residence	B	2,029,135.47	749,171.81	343.0
57	405 GOLDEN HARVEST LP	1	Residence	B	2,029,180.84	749,183.77	341.0
58	407 GOLDEN HARVEST LP	1	Residence	B	2,029,236.42	749,168.05	327.0
59	409 GOLDEN HARVEST LP	1	Residence	B	2,029,291.27	749,166.21	333.0
60	411 GOLDEN HARVEST LP	1	Residence	B	2,029,344.90	749,167.97	329.0
61	413 GOLDEN HARVEST LP	1	Residence	B	2,029,402.73	749,163.37	326.0
63	433 GOLDEN HARVEST LP	1	Residence	B	2,029,432.89	749,286.61	318.0
64	435 GOLDEN HARVEST LP	1	Residence	B	2,029,372.68	749,289.98	321.0
65	437 GOLDEN HARVEST LP	1	Residence	B	2,029,317.93	749,290.55	324.0
66	439 GOLDEN HARVEST LP	1	Residence	B	2,029,263.24	749,297.05	327.0
67	441 GOLDEN HARVEST LP	1	Residence	B	2,029,208.38	749,298.89	330.0
68	445 GOLDEN HARVEST LP	1	Residence	B	2,029,155.71	749,297.47	333.0
69	447 GOLDEN HARVEST LP	1	Residence	B	2,029,106.81	749,278.76	327.0
70	1010 JEWEL CREEK DR	1	Residence	B	2,028,973.30	749,298.64	340.0
71	1012 JEWEL CREEK DR	1	Residence	B	2,028,986.16	749,250.35	341.0
72	1014 JEWEL CREEK DR	1	Residence	B	2,029,000.55	749,201.21	342.0

Ambient	Base Year (2012)				No-Build (2035)						Build (2035) - No Barrier					Build (2035) - With Barrier						
Leq	TNM	Existing	Source	Impacts = 3	Ambient	TNM	No-Build	Impacts = 4	Increases	SubInc = 5	TNM	Build	Impacts = 9	Increases	SubInc = 2	Build	w/Bar	IL	Source	Impacts = 3	Benes = 21	wBar Inc
55	41	55			55	48	55		0		52	55		0		55	55	0	Traffic			0
55	33	55			55	55	55		0		66	66	N/A*	10.5		66	66	0	Traffic	N/A*		11
55	32	55			55	56	56		1		55	55		0		55	55	0	Traffic			0
55	32	55			55	53	55		0		52	55		0		55	55	0	Traffic			0
55	35	55			55	51	55		0		52	55		0		55	55	0	Traffic			0
55	32	55			55	55	55		0		54	55		0		55	55	0	Traffic			0
55	33	55			55	54	55		0		54	55		0		55	55	0	Traffic			0
55	42	55			55	65	65		10		64	64		9		64	64	0	Traffic			9
55	36	55			55	66	66	1	11	1	65	65		10		65	65	0	Traffic			10
55	36	55			55	65	65		10		65	65		10		65	65	0	Traffic			10
55	33	55			55	63	63		8		63	63		8		63	63	0	Traffic			8
55	33	55			55	64	64		9		63	63		8		63	63	0	Traffic			8
54	43	54			54	61	61		7		60	60	N/A*	6		60	60	0	Traffic	N/A*		6
55	39	55			55	65	65		10	1	66	66	N/A*	11		66	66	0	Traffic	N/A*		11
57	35	57			57	63	63		6		63	63		6		63	63	0	Traffic			6
55	39	55			55	63	63		8		62	62		7		62	62	0	Traffic			7
55	37	55			55	64	64		9		63	63		8		63	63	0	Traffic			8
55	36	55			55	64	64		9		63	63		8		63	63	0	Traffic			8
55	38	55			55	57	57		2		60	60	N/A*	5		60	60	0	Traffic			5
55	40	55			55	60	60		5		55	55	N/A*	0		55	55	0	Traffic			0
57	32	57			57	49	57		0		48	57		0		57	57	0	Traffic			0
55	31	55			55	60	60		5		59	59		4		59	59	0	Traffic			4
55	47	55			55	65	65		10	1	66	66	N/A*	11		66	66	0	Traffic	N/A*		11
54	42	54			54	68	68	1	14	1	69	69	N/A*	15		69	69	0	Traffic	N/A*		15
54	36	54			54	73	73	1	19	1	73	73	N/A*	19		73	73	0	Traffic	N/A*		19
55	32	55			55	62	62		7		65	65		10		65	65	0	Traffic			10
54	33	54			54	60	60		6		58	58		4		58	58	0	Traffic			4
55	37	55			55	50	55		0		52	55		0		55	55	0	Traffic			0
55	38	55			55	48	55		0		52	55		0		55	55	0	Traffic			0
58	40	58			58	53	58		0		53	58		0		58	58	0	Traffic			0
58	40	58			58	53	58		0		53	58		0		58	58	0	Traffic			0
58	37	58			58	53	58		0		53	58		0		58	58	0	Traffic			0
48	32	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	34	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	33	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	31	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	30	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	31	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	30	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	30	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	31	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	31	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	31	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	30	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	30	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	31	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	31	48			48	52	52		4		54	54		6		54	54	0	Traffic			6
48	32	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	34	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	34	48			48	53	53		5		53	53		5		53	53	0	Traffic			5
48	36	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	40	48			48	55	55		7		55	55		7		55	55	0	Traffic			7
48	41	48			48	55	55		7		56	56		8		56	56	0	Traffic			8
48	39	48			48	54	54		6		55	55		7		55	55	0	Traffic			7
48	38	48			48	54	54		6		54	54		6		54	54	0	Traffic			6
48	30	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	36	48			48	54	54		6		54	54		6		54	54	0	Traffic			6
48	34	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	33	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	31	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	30	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	30	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	32	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	31	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	33	48			48	53	53		5		53	53		5		53	53	0	Traffic			5
48	34	48			48	51	51		3		51	51		3		51	51	0	Traffic			3
58	40	58			58	54	58		0		54	58		0		58	58	0	Traffic			0
58	41	58			58	54	58		0		54	58		0		58	58	0	Traffic			0
58	40	58			58	54	58		0		54	58		0		58	58	0	Traffic			0

		161					
No.	Address	Dus	USAGE	NAC	x(ft)	y(ft)	z(ft)
73	1016 JEWEL CREEK DR	1	Residence	B	2,029,013.68	749,152.92	344.0
74	1018 JEWEL CREEK DR	1	Residence	B	2,029,026.80	749,104.62	346.0
75	1020 JEWEL CREEK DR	1	Residence	B	2,029,039.92	749,056.59	347.0
76	1022 JEWEL CREEK DR	1	Residence	B	2,029,053.05	749,008.30	348.0
77	1024 JEWEL CREEK DR	1	Residence	B	2,029,066.17	748,960.01	349.0
78	7210 GREEN HOPE SCHOOL RD	1	Residence	B	2,034,014.56	748,256.95	364.0
79	920 TWYLA RD	1	Residence	B	2,032,608.23	748,397.83	370.0
80	1026 JEWEL CREEK DR	1	Residence	B	2,029,075.05	748,910.66	346.0
81	1028 JEWEL CREEK DR	1	Residence	B	2,029,092.25	748,861.16	345.0
82	1030 JEWEL CREEK DR	1	Residence	B	2,029,105.64	748,811.82	343.0
83	1102 JEWEL CREEK DR	1	Residence	B	2,029,119.02	748,762.73	341.0
84	1104 JEWEL CREEK DR	1	Residence	B	2,029,132.41	748,713.39	338.0
85	1106 JEWEL CREEK DR	1	Residence	B	2,029,146.85	748,663.26	336.0
86	1108 JEWEL CREEK DR	1	Residence	B	2,029,122.06	748,582.69	333.0
87	1110 JEWEL CREEK DR	1	Residence	B	2,029,165.06	748,534.33	332.0
88	1112 JEWEL CREEK DR	1	Residence	B	2,029,218.18	748,496.38	330.0
89	1114 JEWEL CREEK DR	1	Residence	B	2,029,280.18	748,479.08	328.0
90	1116 JEWEL CREEK DR	1	Residence	B	2,029,337.74	748,472.11	326.0
91	1118 JEWEL CREEK DR	1	Residence	B	2,029,390.61	748,474.09	324.0
92	1120 JEWEL CREEK DR	1	Residence	B	2,029,440.68	748,474.63	322.0
93	1122 JEWEL CREEK DR	1	Residence	B	2,029,491.68	748,471.10	318.0
94	1124 JEWEL CREEK DR	1	Residence	B	2,029,543.97	748,469.20	315.0
95	431 WESTFALEN DR	1	Residence	B	2,029,745.88	748,563.83	312.0
96	429 WESTFALEN DR	1	Residence	B	2,029,743.28	748,624.26	313.0
97	427 WESTFALEN DR	1	Residence	B	2,029,762.08	748,673.90	315.0
98	425 WESTFALEN DR	1	Residence	B	2,029,749.03	748,736.37	316.0
99	423 WESTFALEN DR	1	Residence	B	2,029,735.22	748,798.35	317.0
100	421 WESTFALEN DR	1	Residence	B	2,029,701.97	748,853.83	318.0
101	419 WESTFALEN DR	1	Residence	B	2,029,615.22	748,854.42	319.0
102	417 WESTFALEN DR	1	Residence	B	2,029,570.48	748,874.50	320.0
103	415 WESTFALEN DR	1	Residence	B	2,029,524.04	748,886.09	322.0
104	413 WESTFALEN DR	1	Residence	B	2,029,475.23	748,888.72	325.0
105	411 WESTFALEN DR	1	Residence	B	2,029,422.21	748,890.29	329.0
106	409 WESTFALEN DR	1	Residence	B	2,029,369.19	748,892.13	332.0
107	407 WESTFALEN DR	1	Residence	B	2,029,316.17	748,893.97	336.0
108	405 WESTFALEN DR	1	Residence	B	2,029,263.42	748,895.54	339.0
109	403 WESTFALEN DR	1	Residence	B	2,029,213.47	748,895.74	341.0
110	404 WESTFALEN DR	1	Residence	B	2,029,249.14	748,755.92	334.0
111	406 WESTFALEN DR	1	Residence	B	2,029,296.38	748,750.70	331.0
112	408 WESTFALEN DR	1	Residence	B	2,029,349.14	748,749.12	328.0
113	410 WESTFALEN DR	1	Residence	B	2,029,401.63	748,747.28	326.0
114	412 WESTFALEN DR	1	Residence	B	2,029,456.93	748,747.99	324.0
115	416 WESTFALEN DR	1	Residence	B	2,029,513.24	748,751.93	321.0
116	420 WESTFALEN DR	1	Residence	B	2,029,572.68	748,729.32	319.0
117	1125 JEWEL CREEK DR	1	Residence	B	2,029,588.75	748,617.23	314.0
118	1121 JEWEL CREEK DR	1	Residence	B	2,029,531.47	748,617.21	317.0
119	1119 JEWEL CREEK DR	1	Residence	B	2,029,477.40	748,618.79	319.0
120	1117 JEWEL CREEK DR	1	Residence	B	2,029,423.60	748,620.62	322.0
121	1115 JEWEL CREEK DR	1	Residence	B	2,029,369.53	748,622.46	325.0
122	1111 JEWEL CREEK DR	1	Residence	B	2,029,314.96	748,635.58	327.0
123	1004 INDIGO RIDGE PL	1	Residence	B	2,029,566.64	748,267.75	312.0
124	1006 INDIGO RIDGE PL	1	Residence	B	2,029,525.69	748,249.35	312.0
125	1008 INDIGO RIDGE PL	1	Residence	B	2,029,506.34	748,239.99	313.0
126	1010 INDIGO RIDGE PL	1	Residence	B	2,029,486.83	748,230.64	314.0
127	1012 INDIGO RIDGE PL	1	Residence	B	2,029,472.52	748,225.72	315.0
128	1014 INDIGO RIDGE PL	1	Residence	B	2,029,444.54	748,213.70	316.0
129	1016 INDIGO RIDGE PL	1	Residence	B	2,029,431.78	748,208.90	317.0
130	1018 INDIGO RIDGE PL	1	Residence	B	2,029,411.71	748,201.03	318.0
131	1040 INDIGO RIDGE PL	1	Residence	B	2,029,293.22	748,138.69	325.0
132	1042 INDIGO RIDGE PL	1	Residence	B	2,029,283.91	748,164.43	325.0
133	1044 INDIGO RIDGE PL	1	Residence	B	2,029,274.46	748,184.64	325.0
134	1046 INDIGO RIDGE PL	1	Residence	B	2,029,265.02	748,204.85	326.0
135	1052 INDIGO RIDGE PL	1	Residence	B	2,029,233.18	748,228.97	327.0
136	1054 INDIGO RIDGE PL	1	Residence	B	2,029,194.75	748,223.52	327.0
137	1056 INDIGO RIDGE PL	1	Residence	B	2,029,179.41	748,219.54	328.0
138	1058 INDIGO RIDGE PL	1	Residence	B	2,029,157.04	748,215.62	328.0
139	1060 INDIGO RIDGE PL	1	Residence	B	2,029,137.26	748,212.94	329.0
140	1080 INDIGO RIDGE PL	1	Residence	B	2,029,179.35	747,954.25	330.0
141	1082 INDIGO RIDGE PL	1	Residence	B	2,029,200.61	747,961.07	329.0

Ambient	Base Year (2012)				No-Build (2035)						Build (2035) - No Barrier					Build (2035) - With Barrier						
Leq	TNM	Existing	Source	Impacts = 3	Ambient	TNM	No-Build	Impacts = 4	Increases	SubInc = 5	TNM	Build	Impacts = 9	Increases	SubInc = 2	Build	w/Bar	IL	Source	Impacts = 3	Benes = 21	wBar Inc
58	42	58			58	55	58		0		55	58		0		58	58	0	Traffic			0
58	43	58			58	55	58		0		55	58		0		58	58	0	Traffic			0
58	43	58			58	55	58		0		56	58		0		58	58	0	Traffic			0
58	44	58			58	56	58		0		56	58		0		58	58	0	Traffic			0
58	45	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
57	31	57			57	53	57		0		52	57		0		57	57	0	Traffic			0
57	40	57			57	66	66	1	9		65	65		8		65	65	0	Traffic			8
58	45	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
58	45	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
58	45	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
58	45	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
58	46	58			58	56	58		0		56	58		0		58	58	0	Traffic			0
58	46	58			58	56	58		0		57	58		0		58	58	0	Traffic			0
58	48	58			58	56	58		0		58	58		0		58	58	0	Traffic			0
58	49	58			58	57	58		0		58	58		0		58	58	0	Traffic			0
58	48	58			58	56	58		0		58	58		0		58	58	0	Traffic			0
58	46	58			58	55	58		0		57	58		0		58	58	0	Traffic			0
58	44	58			58	54	58		0		57	58		0		58	58	0	Traffic			0
48	43	48			48	53	53		5		57	57		9		57	57	0	Traffic			9
48	42	48			48	53	53		5		57	57		9		57	57	0	Traffic			9
48	43	48			48	52	52		4		58	58		10		58	58	0	Traffic			10
48	46	48			48	54	54		6		60	60		12		60	60	0	Traffic			12
48	40	48			48	54	54		6		62	62		14		62	62	0	Traffic			14
48	32	48			48	54	54		6		60	60		12		60	60	0	Traffic			12
48	31	48			48	54	54		6		60	60		12		60	60	0	Traffic			12
48	26	48			48	54	54		6		58	58		10		58	58	0	Traffic			10
48	27	48			48	54	54		6		57	57		9		57	57	0	Traffic			9
48	27	48			48	54	54		6		56	56		8		56	56	0	Traffic			8
48	34	48			48	46	48		0		49	49		1		49	49	0	Traffic			1
48	34	48			48	50	50		2		52	52		4		52	52	0	Traffic			4
48	34	48			48	51	51		3		52	52		4		52	52	0	Traffic			4
48	36	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	37	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	38	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	39	48			48	54	54		6		54	54		6		54	54	0	Traffic			6
48	42	48			48	55	55		7		55	55		7		55	55	0	Traffic			7
48	42	48			48	56	56		8		56	56		8		56	56	0	Traffic			8
48	42	48			48	53	53		5		54	54		6		54	54	0	Traffic			6
48	41	48			48	53	53		5		53	53		5		53	53	0	Traffic			5
48	40	48			48	52	52		4		53	53		5		53	53	0	Traffic			5
48	39	48			48	52	52		4		52	52		4		52	52	0	Traffic			4
48	34	48			48	50	50		2		51	51		3		51	51	0	Traffic			3
48	31	48			48	50	50		2		50	50		2		50	50	0	Traffic			2
48	36	48			48	49	49		1		52	52		4		52	52	0	Traffic			4
48	45	48			48	51	51		3		57	57		9		57	57	0	Traffic			9
48	40	48			48	50	50		2		56	56		8		56	56	0	Traffic			8
48	36	48			48	50	50		2		55	55		7		55	55	0	Traffic			7
48	39	48			48	52	52		4		54	54		6		54	54	0	Traffic			6
48	41	48			48	52	52		4		54	54		6		54	54	0	Traffic			6
48	42	48			48	52	52		4		54	54		6		54	54	0	Traffic			6
48	49	49	Traffic		48	54	54		5		62	62		13		62	60	2	Traffic			11
48	47	48			48	53	53		5		60	60		12		60	58	2	Traffic			10
48	47	48			48	53	53		5		59	59		11		59	58	1	Traffic			10
48	47	48			48	52	52		4		58	58		10		58	57	1	Traffic			9
48	46	48			48	52	52		4		57	57		9		57	56	1	Traffic			8
48	46	48			48	51	51		3		56	56		8		56	55	1	Traffic			7
48	46	48			48	51	51		3		56	56		8		56	55	1	Traffic			7
48	45	48			48	51	51		3		56	56		8		56	55	1	Traffic			7
58	49	58			58	54	58		0		56	58		0		58	56	2	Traffic			-2
58	49	58			58	55	58		0		51	58		0		58	49	9	Traffic		1	-9
58	49	58			58	54	58		0		50	58		0		58	47	11	Traffic		1	-11
58	48	58			58	53	58		0		51	58		0		58	48	10	Traffic		1	-10
58	48	58			58	55	58		0		58	58		0		58	57	1	Traffic			-1
58	50	58			58	56	58		0		58	58		0		58	58	0	Traffic			0
58	51	58			58	57	58		0		60	60		2		60	59	1	Traffic			1
58	53	58			58	59	59		1		61	61		3		61	61	0	Traffic			3
58	54	58			58	61	61		3		63	63		5		63	63	0	Traffic			5
58	46	58			58	54	58		0		59	59		1		59	54	5	Traffic		1	-4
58	45	58			58	54	58		0		59	59		1		59	53	6	Traffic		1	-5

		161						Ambient	Base Year (2012)				No-Build (2035)						Build (2035) - No Barrier					Build (2035) - With Barrier						
No.	Address	Dus	USAGE	NAC	x(ft)	y(ft)	z(ft)	Leq	TNM	Existing	Source	Impacts = 3	Ambient	TNM	No-Build	Impacts = 4	Increases	SubInc = 5	TNM	Build	Impacts = 9	Increases	SubInc = 2	Build	w/Bar	IL	Source	Impacts = 3	Benes = 21	wBar Inc
142	1084 INDIGO RIDGE PL	1	Residence	B	2,029,221.87	747,968.16	329.0	58	45	58			58	54	58		0		60	60		2		60	53	7	Traffic		1	-5
143	1086 INDIGO RIDGE PL	1	Residence	B	2,029,243.13	747,975.25	328.0	58	45	58			58	54	58		0		60	60		2		60	53	7	Traffic		1	-5
144	1088 INDIGO RIDGE PL	1	Residence	B	2,029,264.12	747,982.07	327.0	58	44	58			58	53	58		0		60	60		2		60	53	7	Traffic		1	-5
145	1090 INDIGO RIDGE PL	1	Residence	B	2,029,301.13	747,994.14	327.0	58	47	58			58	55	58		0		63	63		5		63	54	9	Traffic		1	-4
146	1029 INDIGO RIDGE PL	1	Residence	B	2,029,348.37	748,010.94	325.0	58	47	58			58	55	58		0		64	64		6		64	54	10	Traffic		1	-4
147	1027 INDIGO RIDGE PL	1	Residence	B	2,029,368.32	748,020.92	323.0	58	46	58			58	54	58		0		64	64		6		64	54	10	Traffic		1	-4
148	1025 INDIGO RIDGE PL	1	Residence	B	2,029,388.27	748,031.15	322.0	58	46	58			58	55	58		0		65	65		7		65	54	11	Traffic		1	-4
149	1023 INDIGO RIDGE PL	1	Residence	B	2,029,407.95	748,041.65	321.0	58	47	58			58	55	58		0		66.3	66	1	8		66	55	11	Traffic		1	-3
150	1021 INDIGO RIDGE PL	1	Residence	B	2,029,427.64	748,052.15	320.0	58	47	58			58	55	58		0		67.0	67	1	9		67	55	12	Traffic		1	-3
151	1019 INDIGO RIDGE PL	1	Residence	B	2,029,461.76	748,070.52	319.0	58	49	58			58	56	58		0		68	68	1	10	1	68	55	13	Traffic		1	-3
152	1015 INDIGO RIDGE PL	1	Residence	B	2,029,496.93	748,090.47	317.0	58	48	58			58	55	58		0		67	67	1	9		67	55	12	Traffic		1	-3
153	1013 INDIGO RIDGE PL	1	Residence	B	2,029,516.35	748,101.75	316.0	58	48	58			58	55	58		0		67	67	1	9		67	55	12	Traffic		1	-3
154	1011 INDIGO RIDGE PL	1	Residence	B	2,029,535.51	748,113.04	315.0	58	48	58			58	55	58		0		67	67	1	9		67	55	12	Traffic		1	-3
155	1009 INDIGO RIDGE PL	1	Residence	B	2,029,554.67	748,124.59	314.0	58	48	58			58	55	58		0		67	67	1	9		67	55	12	Traffic		1	-3
156	1007 INDIGO RIDGE PL	1	Residence	B	2,029,573.57	748,136.40	313.0	58	49	58			58	55	58		0		67	67	1	9		67	55	12	Traffic		1	-3
157	1005 INDIGO RIDGE PL	1	Residence	B	2,029,606.11	748,156.87	312.0	58	50	58			58	56	58		0		68	68	1	10	1	68	55	13	Traffic		1	-3
158	509 MILLS PARK DR	1	School	B	2,030,768.28	749,775.37	336.0	66	31	66		1	66	55	66		0		55	66		0		66	66	0	Traffic	1		0
159	509 MILLS PARK DR	1	School	B	2,030,948.22	749,709.65	342.0	66	32	66		1	66	58	66		0		57	66		0		66	66	0	Traffic	1		0
160	509 MILLS PARK DR	1	School	B	2,031,320.15	750,363.14	370.0	66	21	66		1	66	55	66		0		57	66		0		66	66	0	Traffic	1		0
161	102 HILLIARD LN	1	Residence	B	2,032,964.03	748,452.23	368.0	57	32	57			57	61	61		4		60	60		3		60	60	0	Traffic			3
162	7216 GREEN HOPE SCHOOL RD	1	Residence	B	2,033,493.23	748,296.73	362.0	57	31	57			57	56	57		0		54	57		0		57	57	0	Traffic			0
163	3761 NC 55 HWY	1	Mulch	F	2,037,508.08	751,256.02	380.0	55	66	66	Traffic		55	67	67		2		70	70		4		70	70	0	Traffic			4
164	419 GOLDEN HARVEST LP	1	Residence	B	2,029,452.05	749,182.54	322.0	48	33	48			48	53	53		5		53	53		5		53	53	0	Traffic			5
2001	*2001 - Monitoring Station*	*1*	*Residence*	*B*	*2,029,754.50*	*748,230.13*	*302.0*	*48*	*43*	*48*			*48*	*53*	*53*		*5*		*65*	*65*		*17*	*1*	*65*	*65*	*0*	*Traffic*			*17*
4501	*4501 - Monitoring Station*	*1*	*Residence*	*B*	*2,031,047.75*	*749,838.81*	*346.0*	*66*	*32*	*66*		*1*	*66*	*59*	*66*		*0*		*60*	*66*		*0*		*66*	*66*	*0*	*Traffic*	*1*		*0*
4502	*4502 - Monitoring Station*	*1*	*Residence*	*B*	*2,030,357.63*	*749,644.94*	*308.0*	*55*	*28*	*55*			*55*	*51*	*55*		*0*		*51*	*55*		*0*		*55*	*55*	*0*	*Traffic*			*0*
4511	*4511 - Monitoring Station*	*1*	*Residence*	*B*	*2,029,112.25*	*747,970.13*	*344.0*	*67*	*62*	*67*		*1*	*67*	*69*	*69*	*1*	*2*		*70*	*70*	*1*	*3*		*70*	*70*	*0*	*Traffic*	*1*		*3*
4512	*4512 - Monitoring Station*	*1*	*Residence*	*B*	*2,029,185.38*	*748,124.50*	*326.5*	*58*	*53*	*58*			*58*	*59*	*59*		*1*		*61*	*61*		*3*		*61*	*61*	*0*	*Traffic*			*3*
4521	*4521 - Monitoring Station*	*1*	*Residence*	*B*	*2,032,522.00*	*748,187.63*	*374.0*	*57*	*51*	*57*			*57*	*67*	*67*	*1*	*10*		*67*	*67*	*1*	*10*	*1*	*67*	*67*	*0*	*Traffic*	*1*		*10*
4522	*4522 - Monitoring Station*	*1*	*Residence*	*B*	*2,032,498.75*	*749,217.00*	*342.0*	*55*	*50*	*55*			*55*	*63*	*63*		*8*		*66*	*66*	*1*	*11*	*1*	*66*	*66*	*0*	*Traffic*	*1*		*11*
4525	*4525 - Monitoring Station*	*1*	*Residence*	*B*	*2,032,417.75*	*748,808.75*	*352.0*	*54*	*47*	*54*			*54*	*66*	*66*	*1*	*12*	*1*	*68*	*68*	*1*	*14*	*1*	*68*	*68*	*0*	*Traffic*	*1*		*14*

* Property anticipated to be aqcquired for right-of-way or vacant and scheduled for demolition

Appendix D

Air Quality Assessment
(streamlined version)

Morrisville Parkway Extension Widening and NC 540 Interchange
Streamlined Air Quality Assessment
NCDOT TIP Project No. U-5315
WBS No. 45429.1.1

Introduction

Air pollution originates from various sources. Emissions from industry and internal combustion engines are the most prevalent sources. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air quality. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility.

The Federal Clean Air Act of 1970 established the National Ambient Air Quality Standards (NAAQS). These standards were established to protect the public from known or anticipated effects of air pollutants. The most recent amendments to the NAAQS contain criteria for sulfur dioxide (SO_2), particulate matter (PM), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead (Pb).

The primary pollutants from motor vehicles are unburned hydrocarbons, nitrous oxides, carbon monoxide, and particulates. Hydrocarbons and nitrogen oxides can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO_2. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources.

A project-level air quality analysis was prepared for this project. A copy of the unabridged version of the full technical report entitled *Air Quality Assessment*, dated July 2012, can be viewed at the Town of Cary Engineering Office, located at 316 N. Academy Street, Cary NC 27511.

Attainment Status

The project is located in Wake County, which is within the Raleigh-Durham-Chapel Hill non-attainment area for ozone (O3) and the Raleigh-Durham non-attainment area for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated this area as a moderate nonattainment area for CO. However, due to improved monitoring data, this area was redesignated as maintenance for CO on September 18, 1995. On June 20, 2013, the United States Environmental Protection Agency (USEPA) approved a maintenance plan known as a “limited maintenance plan” for the Triangle, North Carolina CO maintenance plan area which is comprised of the entire counties of Wake and Durham, which was effective on July 22, 2013 with a 2015 horizon year. Because of this plan, CAMPO no longer has to complete a regional emissions analysis for the CO standard pursuant to 40 CFR 93.109(e). This area was designated nonattainment for O3 under the eight-hour ozone standard effective June 15, 2004. Again, due to improved monitoring data, this area was redesignated as maintenance for O3 under the eight-hour standard on December 26, 2007. Section 176(c)

of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP).

On January 21, 2015, the CAMPO made a conformity determination on their amended FY 2012-2018 Transportation Improvement Program (TIP). On February 4, 2015, the FHWA reviewed the CAMPO Transportation Conformity Determination Report (U-5315: A&B Amendment #18 – Morrisville Parkway Extension) for the FY 2012-2018 TIP and determined that the CAMPO FY 2012-2018 TIP (a direct subset of the 2035 LRTP) conforms to the purpose of the State Implementation Plan (SIP) in accordance with the final conformity rule found in 40 CFR 93. FHWA made this determination following a coordinated review with the USEPA, Region 4.

Carbon Monoxide Microscale Analysis

Because the project is located within the Raleigh-Durham-Chapel Hill maintenance area for carbon monoxide (CO), a microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC - A Modeling Methodology for Predicting Pollutant Concentrations near Roadway Intersections" was used to predict the CO concentration near sensitive receptors. Carbon monoxide vehicle emission factors were calculated for the years 2010, 2015, 2020 and 2035 using the EPA publication "Mobile Source Emission Factors", and the MOBILE6 mobile source emissions computer model. The background CO concentration for the project area was estimated to be 2.9 parts per million (ppm). Consultation with the North Carolina Department of Environment & Natural Resources' Air Quality Section indicated that an ambient CO concentration of 2.9 ppm is suitable for calculations in Wake County.

The worst-case air quality scenario was determined to be at the intersection of NC 55 and the proposed Morrisville Parkway Extension. The predicted 1-hour average CO concentrations for the evaluation years of 2010, 2015, 2020, and 2035 Build and No Build are in the table below.

Microscale Air Quality Analysis
Maximum 1-Hour CO Concentrations (ppm)*
TIP Project U-5315 – Morrisville Parkway Extension Widening and NC 540 Interchange
Wake County, Cary N.C

2010	2015		2020		2035	
No-Build	Build	No-Build	Build	No-Build	Build	No-Build
1 hour	1 hour	1 hour	1 hour	1 hour	1 hour	1 hour
5.7	7.1	7.2	7.6	7.7	9.2	9.0

*The National Ambient Air Quality Standard for CO is 35 ppm for a one hour average.
Concentrations include an ambient background level of 2.9 ppm (1 hour)

Mobile Source Air Toxics (MSAT)

Background

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/iris/). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 1.

Motor Vehicle Emissions Simulator (MOVES)

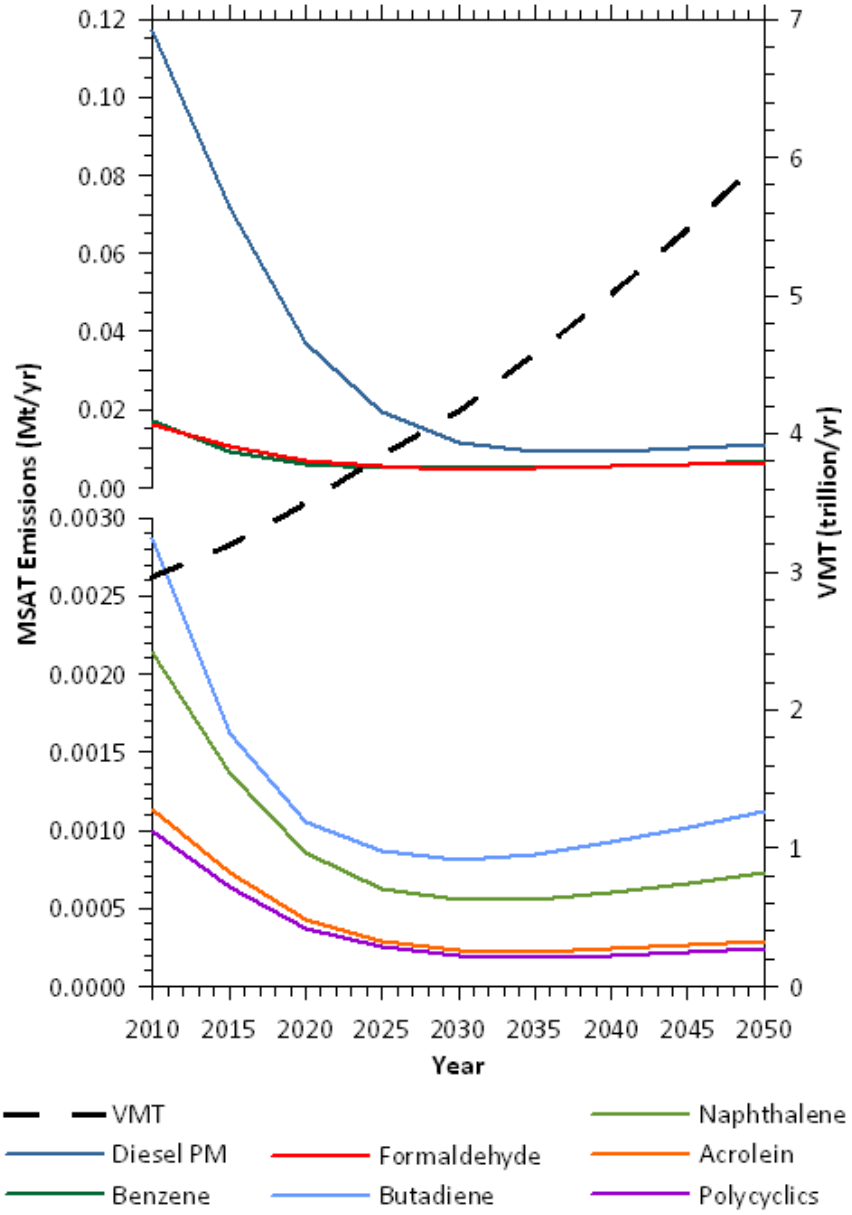
According to EPA, MOVES improves upon the previous MOBILE model in several key aspects: MOVES is based on a vast amount of in-use vehicle data collected and analyzed since the latest release of MOBILE, including millions of emissions measurements from light-duty vehicles. Analysis of this data enhanced EPA's understanding of how mobile sources contribute to emissions inventories and the relative effectiveness of various control strategies. In addition, MOVES accounts for the significant effects that vehicle speed and temperature have on PM emissions estimates, whereas MOBILE did not. MOVES2010b includes all air toxic pollutants in NATA that are emitted by mobile sources. EPA has incorporated more recent data into MOVES2010b to update and enhance the quality of MSAT emission estimates. These data reflect advanced emission control technology and modern fuels, plus additional data for older technology vehicles.

Based on an FHWA analysis using EPA's MOVES2010b model, as shown in Figure 1, even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period.

The implications of MOVES on MSAT emissions estimates compared to MOBILE are: lower estimates of total MSAT emissions; significantly lower benzene emissions; significantly higher diesel PM emissions, especially for lower speeds. Consequently, diesel PM is projected to be the dominant component of the emissions total.

Figure 1

National MSAT Emission Trends 1999 – 2050
For Vehicles Operating On Roadways Using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived
information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

Source: EPA MOVES2010b model runs conducted during May - June 2012 by FHWA.

MSAT Research

Air toxics analysis is a continuing area of research. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health outcomes as a result of lifetime MSAT exposure remain limited. These limitations impede the ability to evaluate how potential public health risks posed by MSAT exposure should be factored into project-level decision-making within the context of NEPA.

Nonetheless, air toxics concerns continue to be raised on highway projects during the NEPA process. Even as the science emerges, we are duly expected by the public and other agencies to address MSAT impacts in our environmental documents. The FHWA, EPA, the Health Effects Institute, and others have funded and conducted research studies to try to more clearly define potential risks from MSAT emissions associated with highway projects. The FHWA will continue to monitor the developing research in this field.

NEPA Context

The NEPA requires, to the fullest extent possible, that the policies, regulations, and laws of the Federal Government be interpreted and administered in accordance with its environmental protection goals. The NEPA also requires Federal agencies to use an interdisciplinary approach in planning and decision-making for any action that adversely impacts the environment. The NEPA requires, and FHWA is committed to, the examination and avoidance of potential impacts to the natural and human environment when considering approval of proposed transportation projects. In addition to evaluating the potential environmental effects, we must also take into account the need for safe and efficient transportation in reaching a decision that is in the best overall public interest. The FHWA policies and procedures for implementing NEPA are contained in regulation at 23 CFR Part 771.

Consideration of MSAT in NEPA Documents

The FHWA developed a tiered approach with three categories for analyzing MSAT in NEPA documents, depending on specific project circumstances:

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; or
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

For projects warranting MSAT analysis, the seven priority MSAT should be analyzed.

(1) Projects with No Meaningful Potential MSAT Effects, or Exempt Projects.

The types of projects included in this category are:

•Projects qualifying as a categorical exclusion under 23 CFR 771.117(c) (subject to consideration whether unusual circumstances exist under 23 CFR 771.117(b));
•Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
•Other projects with no meaningful impacts on traffic volumes or vehicle mix.

For projects that are categorically excluded under 23 CFR 771.117(c), or are exempt from conformity requirements under the Clean Air Act pursuant to 40 CFR 93.126, no analysis or discussion of MSAT is necessary. Documentation sufficient to demonstrate that the project qualifies as a categorical exclusion and/or exempt project will suffice. For other projects with no or negligible traffic impacts, regardless of the class of NEPA environmental document, no MSAT analysis is recommended. The types of projects categorically excluded under 23 CFR 771.117(d) or exempt from certain conformity requirements under 40 CFR 93.127 do not warrant an automatic exemption from an MSAT analysis, but they usually will have no meaningful impact. However, the project record should document the basis for the determination of "no meaningful potential impacts" with a brief description of the factors considered.

(2) Projects with Low Potential MSAT Effects

The types of projects included in this category are those that serve to improve operations of highway, transit, or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. This category covers a broad range of projects.

We anticipate that most highway projects that need an MSAT assessment will fall into this category. Any projects not meeting the criteria in category (1) or category (3) below should be included in this category. Examples of these types of projects are minor widening projects; new interchanges, replacing a signalized intersection on a surface street; or projects where design year traffic is projected to be less than 140,000 to 150,000 annual average daily traffic (AADT).

For these projects, a qualitative assessment of emissions projections should be conducted. This qualitative assessment would compare, in narrative form, the expected effect of the project on traffic volumes, vehicle mix, or routing of traffic and the associated changes in MSAT for the project alternatives, including no-build, based on VMT, vehicle mix, and speed. It would also discuss national trend data projecting substantial overall reductions in emissions due to stricter engine and fuel regulations issued by EPA. Because the emission effects of these projects typically are low, we expect there would be no appreciable difference in overall MSAT emissions among the various alternatives.

In addition to the qualitative assessment, a project-level air quality analysis for this category of projects must include a discussion of information that is incomplete or unavailable for a project specific assessment of MSAT impacts, in compliance with the

Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)). This discussion should explain how current scientific techniques, tools, and data are not sufficient to accurately estimate human health impacts that could result from a transportation project in a way that would be useful to decision-makers. Also in compliance with 40 CFR 150.22(b), it should contain information regarding the health impacts of MSAT.

(3) Projects with Higher Potential MSAT Effects

This category includes projects that have the potential for meaningful differences in MSAT emissions among project alternatives. We expect a limited number of projects to meet this two-pronged test. To fall into this category, a project should:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of diesel particulate matter in a single location, involving a significant number of diesel vehicles for new projects or accommodating with a significant increase in the number of diesel vehicles for expansion projects; or
- Create new capacity or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,0002 or greater by the design year;

And also

- Proposed to be located in proximity to populated areas.

Projects falling within this category should be more rigorously assessed for impacts, including completion of a quantitative analysis to forecast local-specific emission trends of the priority MSAT for each alternative, to use as a basis of comparison. This analysis also may address the potential for cumulative impacts, where appropriate, based on local conditions. How and when cumulative impacts should be considered would be addressed as part of a project-level air quality analysis. If the analysis for a project in this category indicates meaningful differences in levels of MSAT emissions among alternatives, mitigation options should be identified and considered.

This project falls under Category (2) because it proposes a new interchange and roadway widening, and the Design Year traffic is not projected to meet or exceed the 140,000 to 150,000 AADT criterion.

Qualitative MSAT Analysis

A qualitative MSAT analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The analysis is based on a comparison of vehicle miles traveled (VMT) for each alternative.

Phase I of the proposed action is to build a new interchange between NC 540 and Morrisville Parkway Extension. For each interchange configuration alternative, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The estimated VMT under each of the Build Alternatives are expected to be nearly the same.

Phase II of the proposed action accounts for the widening of the Morrisville Parkway Extension to four lanes, once traffic demand warrants such widening. The VMT expected for the Build Alternative would be slightly higher than that of the No Build conditions, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases.

Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent from 2010 to 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in virtually all locations.

In sum, under all Build Alternatives in the design year it is expected there would be reduced MSAT emissions in the immediate area of the project, relative to the No Build conditions, due to the reduced VMT associated with the EPA's MSAT reduction programs.

Incomplete Or Unavailable Information For Project-Specific MSAT Health Impacts Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action.

The U.S. Environmental Protection Agency (EPA) is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in

the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents. Among the adverse health effects linked to MSAT compounds at high exposures are; cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts - each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70 year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational
exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

MSAT Conclusion

What we know about mobile source air toxics is still evolving. As the science progresses FHWA will continue to revise and update this guidance. FHWA is working with Stakeholders, EPA and others to better understand the strengths and weaknesses of developing analysis tools and the applicability on the project level decision documentation process.

Construction Air Quality

Air Quality impacts resulting from roadway construction activities are typically not a concern when contractors utilize appropriate control measures. During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to ensure burning will be done at the greatest distance practical from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits. Burning will be

performed under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents.

Burning of Debris

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the Contractor. Any burning done will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520.

Summary

Vehicles are a major contributor to decreased air quality because they emit a variety of pollutants into the air. Changing traffic patterns are a primary concern when determining the impact of a new highway facility or the improvement of an existing highway facility. New highways or the widening of existing highways increase localized levels of vehicle emissions, but these increases could be offset due to increases in speeds from reductions in congestion and because vehicle emissions will decrease in areas where traffic shifts to the new roadway. Significant progress has been made in reducing criteria pollutant emissions from motor vehicles and improving air quality, even as vehicle travel has increased rapidly. This project is not anticipated to create any adverse effects on the air quality of the surrounding area.

The project is located in Wake County, which complies with the National Ambient Air Quality Standards. This project will not add substantial new capacity or create a facility that is likely to meaningfully increase emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this attainment area. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

A microscale hot-spot analysis that predicted future carbon monoxide concentrations resulting from the proposed highway improvements indicated that no violations of the applicable NAAQS CO concentrations are anticipated. Additionally, this project will not add substantial new vehicle capacity or create a facility that is likely to meaningfully increase vehicle emissions. Therefore, it is not anticipated to create any adverse effects on the air quality of this nonattainment area.

Appendix E

Public Involvement

Public Workshop Sign-In

Due to personal information provided at sign-in, this information is only available upon request from the Town.

Email Correspondence

Email Discussion with Cary Citizen, December 20, 2011

From: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 7:31 AM
To: Todd Delk
Subject: Phase 3 Morrisville Parkway

Hi Todd -

I'm a Cary resident and was wondering when Phase 3 of Morrisville Parkway is slated to start construction and when it is expected to be completed.

Thank you.

[personal contact information removed before publication]

From: Todd Delk <Todd.Delk@townofcary.org>
To: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 3:54 PM
Subject: RE: Phase 3 Morrisville Parkway

[personal contact information removed before publication]

Thanks for your note.

The Morrisville Parkway bridge over NC 540 is actually nearing completion now as part of the NC 540 construction. The Town is working with the three developers along the proposed Morrisville Parkway alignment to design and construct a two-lane roadway between NC 55 and Green Level Church Road (older deign shown here in photo). Each section will be completed by developers as they forward with their sites (see Staff Report EN11-043 and Site Plan 07-SP-095 as examples). While nothing official has been set so far, I would expect the roadway to be completed (as a two-lane road) likely in 2013.

The Town has also started a study to look at the design and environmental documentation for the NC 540 interchange with Morrisville Parkway. The project will reevaluate the interchange configuration and intersections considering project costs, impacts, and tolling. The study is expected to take 12 months and be followed by final design of the interchange. Two public workshops will be held for the interchange study, with the first upcoming in February (date and place being determined). We will move forward with final design for the interchange this fall. Council and staff will be working with NCDOT and the Toll Authority to determine how the interchange construction may be funded. Again, nothing official, but I would project that the interchange could be in place by 2014 or 2015.

I hope this helps and I will put you on my list of citizens to inform when we set the first public workshop for the interchange study. Stay informed also through the project website at: http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm.

Thanks, Todd

Todd B. Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Dept.
316 N. Academy Street

PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

From: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 4:11 PM
To: Todd Delk
Subject: Re: Phase 3 Morrisville Parkway

Todd -

Thanks for the information.

I live in Highcroft and traffic on Green Hope School road west of 55 has been getting heavier and heavier. My hope is that phase 3 of Morrisville Parkway will help alleve traffic on Green Hope School rd. I'm surprised phase 3 is just 2 lanes and not 4 as it is for the phase 2 section. I think the 540 interchange will be a popular one so the sooner the better for that project.

Thank you again for the information and will keep up to date via the website you reference.

[personal contact information removed before publication]

From: Todd Delk <Todd.Delk@townofcary.org>
To: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 4:17 PM
Subject: RE: Phase 3 Morrisville Parkway

FYI – The Town has the environmental permit to construct Morrisville Parkway in that section, but the agencies stipulated that we built it as a 2-lane to start and expand to 4-lanes when it becomes necessary.

We are requiring the developers to design and reserve the right-of-way for four lanes, but build only the first two lanes. They are going to be building their sections PAST their developments though to connect to NC 55 and NC 540 in order to finish the connection and make up for the not having to build all 4 lanes. In addition, the Toll Authority has only built a two-lane bridge over NC 540.

Thanks, Todd

From: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 4:31 PM
To: Todd Delk
Subject: Re: Phase 3 Morrisville Parkway

Personally, I think a 2 lane bridge over 540 is a mistake as traffic in this area will only continue to grow. Out of your control however.

Thanks again. Really appreciate the quick and thorough response.

Email Discussion with Cary Citizen, December 20-21, 2011

From: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 3:39 PM
To: Todd Delk
Subject: Morrisville Parkway

Todd,

We live in the Copperleaf subdivision and many of us wanted to know if there is any update on Morrisville Pkwy connecting to NC 55 and also if there are any plans to re-pave Morrisville Parkway from our neighborhood to the Chatham County line? It is in horrible condition.

Also, what are the plans for Green Level Church Road south from where the 4-lane stops?

thanks!

[personal contact information removed before publication]

From: Todd Delk <Todd.Delk@townofcary.org>
To: *[personal contact information removed before publication]*
Sent: Tuesday, December 20, 2011 4:20 PM
Subject: RE: Morrisville Parkway

[personal contact information removed before publication]

Thanks for your note.

The Morrisville Parkway bridge over NC 540 is actually nearing completion now as part of the NC 540 construction. The Town is working with the three developers along the proposed Morrisville Parkway alignment to design and construct a two-lane roadway between NC 55 and Green Level Church Road (older design shown here in photo). Each section will be completed by developers as they forward with their sites (see Staff Report EN11-043 and Site Plan 07-SP-095 as examples). While nothing official has been set so far, I would expect the roadway to be completed (as a two-lane road) likely in 2013.

The Town has also started a study to look at the design and environmental documentation for the NC 540 interchange with Morrisville Parkway. The project will reevaluate the original interchange configuration and intersections considering project costs, impacts, and tolling. The study is expected to take 12 months. Two public workshops will be held for the interchange study, with the first upcoming in February (date and place being determined). We will move forward with final design for the interchange this fall. Council and staff will be working with NCDOT and the Toll Authority to determine how the interchange construction may be funded. Again, nothing official, but I would project that the interchange could be in place by 2014 or 2015.

In terms of the existing road between your subdivision and the Chatham line, the road is a state road and maintained by NCDOT. We have spoke to them about the deteriorating condition and asked that they work on pavement maintenance, but it is not on this year's list.

Lastly, for Green Level Church Road, the Town will be making some short-term improvements from the recent corridor study or the next year. We have been working the developer near Morrisville Parkway as well and it looks like we will be fixing the dog-leg condition at the end of the 4-lane section there next summer, making it a straight connection between Morrisville Parkway and Green Hope School Road. There currently is no planned projects to widen GLC Road south of that area in the near future though.

I hope this helps. I will put you on my list of citizens to inform when we set the first public workshop for the interchange study. Stay informed also through the Morrisville Parkway project website at: http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm.

Thanks, Todd

Todd B. Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Dept.
316 N. Academy Street
PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

From: *[personal contact information removed before publication]*
Sent: Wednesday, December 21, 2011 11:39 AM
To: Todd Delk
Subject: Re: Morrisville Parkway

Thank you Todd for the quick reply. I will be interested in the MP interchange with 540 meeting. That's the one we all want to see happen sooner than later.

[personal contact information removed before publication]

Email Discussion with Cary Citizen, January 18-February 9, 2012

From: *[personal contact information removed before publication]*
Sent: Wednesday, January 18, 2012 2:26 AM
To: Todd Delk
Subject: Morrisville Parkway extension

Hi Todd,

I wanted to pass along some concerns regarding the proposed extension of the Morrisville Parkway from NC-55 to Green Level Church Road. The traffic in west Cary is growing rapidly. The new I-540 is suppose to help this, but this is unlikely to happen due to the expensive tolls. In addition, there is only one access to get on the new I-540 between NC-55 and US-64.

I read the latest update regarding the Morrisville Parkway extension on the Town of Cary website. It appears that a 2 lane vs. a 4 lane road is being considered. Also, it is unclear if and when the interchange at I-540 would be completed. There is a proposal to allow 3 developers to do this extension. This needs to be studied carefully before going forward.

Currently, Green Level Church road is highly traveled and fragmented. Many people from western Wake county, Apex, etc. are using this road. Various developers have agreed to "widen" this road, but this has resulted in lots of traffic delays and an overall poor road. I am afraid that this is what the proposed Morrisville Parkway extension will end up being. If this is not done properly, we will end up with more traffic delays, backups, accidents, etc.

This Morrisville Parkway extension needs to be done as soon as possible. It needs to be 4 lanes with an interchange at I-540. Also, Green Level Church road needs to be 4 lanes from O'Kelly Chapel Road to US-64. With this, along with the opening of the new I-540 section from NC-55 to US-64, the traffic problem in west Cary would be resolved for now and many years ahead.

I am taking time to email this to you because of my experience driving in this area the last several years, as well as years of experience of driving in fast growing areas. Also, there are many, many people here in west Cary very concerned with the current traffic problems, and the progress so far to resolve this.

I hope this will help, and would appreciate a response if feasible.

Sincerely,
[personal contact information removed before publication]

On Thu, Feb 9, 2012 at 6:07 PM, Todd Delk <Todd.Delk@townofcary.org> wrote:

[personal contact information removed before publication],

I apologize about taking a little bit in getting back to you. It is only due to fact I was in the midst of getting a lot of things ready and coordinated that directly address your email.

The Town has heard numerous concerns and questions about Morrisville Parkway, its extension, and the future interchange with NC 540. Just this week, we have updated the Town project website with new information concerning how development in the area is working to create the missing link in the Parkway, and how the Town is working on the interchange design. Please go to http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm to get all the updated information and get filled in on the various activities going on. I think this will answer many of your questions and explain the plan for the roadway as we move forward.

Also, we just recently confirmed that we will be holding a public work session about the extension and the interchange in western Cary on February 28. Below, I have copied the letter we sent to property owners within 400 feet of the extension just this week.

> *The Town of Cary invites you to a Citizen Information Workshop for the proposed extension of Morrisville Parkway from NC 55 west to the intersection of Green Level Church Road, including the NC 540 interchange. The Town is in the early stages of the project. We encourage you to come to the workshop to learn about particular elements of this proposed project, consider the project schedule, and review three alternatives for the NC 540/Morrisville Parkway interchange.*
>
> *The workshop will be held on **Tuesday, February 28, 2012, from 5 p.m. to 7 p.m. at the Cary Park Clubhouse,** located at 5353 Cary Glen Boulevard in western Cary. Project area maps, interchange design concepts, and other information will be available for viewing, and Town staff will be available to answer questions and discuss concerns about the future project. We look forward to getting your feedback on the project.*
>
> *If you are unable to attend the Citizen Workshop, questions and comments may be submitted in advance to my attention at Town of Cary Engineering Department; PO Box 8005, Cary, NC 27512-8005 or by e-mail at todd.delk@townofcary.org. You may also call me at (919) 462-3834. General information regarding this project is available on the Town's website (http://www.townofcary.org) on the Engineering Department's Street Projects webpage.*
>
> *Your participation in this public process will help ensure that the best solutions are developed for our community. Thank you for helping make the Town of Cary a great place to live, play, and raise a family.*

I hope to see you at the meeting and will be more than glad to talk to you about the project that evening. Thank you for your thoughtful email and interest in the project. I have added your email to the project email list so you will get future updates. Feel free to call or email with any additional comments or questions.

Sincerely,
Todd

Todd B. Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Dept.
316 N. Academy Street
PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

From: *[personal contact information removed before publication]*
Sent: Thursday, February 09, 2012 7:59 PM
To: Todd Delk
Subject: Re: Morrisville Parkway extension

Hi Todd,
Thanks for your response. I will do my best to make the meeting on the 28th, and look forward to meeting you. Thanks again for sharing the updated information with me.

Sincerely,

[personal contact information removed before publication]

Email from Cary Citizen, March 13, 2012

From: *[personal contact information removed before publication]*
Sent: Tuesday, March 13, 2012 9:50 AM
To: Todd Delk
Subject: Morrisville Pkwy Extension and 540 Connection

Hello Mr. Todd Delk,

was unable to attend the 1st community public workshop for this study. Therefore, I would like to comment on these proposals. I believe having the interchange drop into a two lane area along with Hwy 55 intersecting with Morrisville Pwky will increase the congestion and make this area undesirable for Western Cary. One of the main selling points of this area was the uncongested and beautiful scenary that is affored along with the convenience of the schools. I also feel that there could be potential safety issues with a major artery (540) so close to the elementary and middle schools and allowing traffic to enter into this area to easily. There are two other major interchanges that are more suitable with commercial developed areas that have been choosen already not our residential areas. Please seriously think about not doing this interchange as the Town of Cary will see dramatic changes to this more rustic and rural area if this interchange is allowed. A connection to Hwy 55 is more suitable for Morrisville Pwky.

Thank you,
--

[personal contact information removed before publication]

Email Discussion with Staff at US Army Reserve Center (Cary), February 9, 2012

From: Ferguson, Nancy J Mrs CIV 81ST RSC [mailto:nancy.jn.ferguson@usar.army.mil]
Sent: Thursday, February 09, 2012 8:09 AM
To: Todd Delk
Cc: Habig, Lawrence R LTC USAR 81ST RSC DPW
Subject: Town of Cary citizen info workshop (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: NONE

Please provide the agenda and/or documentation that will be discussed at the Cary Citizen Workshop scheduled for Tuesday, February 28, 2012 at the Cary Park Clubhouse. The 81st Regional Support Command Cary Reserve Center is located on NC Hwy 55 where the extension will be constructed.
If you have any questions, please do not hesitate to call or email me.

Thanks,

V/r,

Nancy J.N. Ferguson

81st RSC
DPW Facility Plans and Engineering Branch
1525 Marion Avenue, Fort Jackson SC 29207-6070
Nancy.JN.Ferguson@usarc.army/mil
P: 803.751.9385 Office
F: 803.751.9631

How well did the DPW serve you today? Please click on the link below and leave a comment.
http://ice.disa.mil/index.cfm?fa=card&site_id=959&service_provider_id=119121

Classification: UNCLASSIFIED
Caveats: NONE

From: Todd Delk
Sent: Thursday, February 09, 2012 9:51 AM
To: 'Ferguson, Nancy J Mrs CIV 81ST RSC'
Cc: 'Habig, Lawrence R LTC USAR 81ST RSC DPW'
Subject: RE: Town of Cary citizen info workshop (UNCLASSIFIED)

Ms. Ferguson,

Thanks for your messages and good to talk with you on the phone this morning.

The best way to keep up with the process from afar will be to follow updates on our project website at:
http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm

Meeting materials and comments we receive at the meeting will be posted there.
You can also feel free to call me with any questions or comments.

Thanks again, Todd

Todd B. Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Dept.
316 N. Academy Street
PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

Email Discussion with Cary Citizen, March 22-27, 2012

From: *[personal contact information removed before publication]*
Sent: Thursday, March 22, 2012 3:50 PM
To: Tim Bailey
Subject: Morrisville Parkway Interchange w/ I-540

Hi Tim,

We have an HOA meeting coming up and we were wondering if you have any updates you can share regarding the status of studying and constructing the Morrisville parkway interchange with I-540? Any news or developments?

Also, with the new section of Highcroft being built how, if at all, will this impact the construction of Morrisville Parkway east of I-540? Any sense for when the full span of roadway between 540 and HWY 55 will be constructed?

Hoping you can shed some perspective on plans, developments and timelines on these issues. Likewise, if you have any perspective on the widening of Carpenter Fire Station over the single lane stretch as it approaches HWY 55, that feedback would be welcome too…

Please share your thoughts when you have a chance. Our residents will appreciate it! Thanks Tim….

[personal contact information removed before publication]

From: Tim Bailey
Sent: Thursday, March 22, 2012 4:25 PM
To: *[personal contact information removed before publication]*
Cc: Todd Delk
Subject: RE: Morrisville Parkway Interchange w/ I-540

Todd Delk is working on the study and will give you an update.

For Highcroft Village North they are constructing two lanes with a median from their western property line to NC55.

The Fryar tract PDD amendment is on the Town Council agenda for Thursday night and would be required to build a significant segment. There is a new developer looking at the property near Twyla Road. These two projects would complete most of the uncommitted road sections and the Town may cover the short gap. We also want to seek grant funding from NCDOT and other sources.

Tuesday night Town Council approved sending a bond referendum to the voters in November that would likely include some work on Carpenter Fire Station Road, right now we are focusing on the NC55 intersection widening and the railroad bridge where the capacity bottleneck is worst. We are still making refinements to the project list.

I hope this update is helpful. Stay in touch as a lot of things are in the works that could be positive progress by the end of the year.

Tim Bailey, P.E.
Director of Engineering
Town of Cary
tim.bailey@townofcary.org
919-469-4034

From: Todd Delk [mailto:Todd.Delk@townofcary.org]
Sent: Thursday, March 22, 2012 4:30 PM
To: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Interchange w/ I-540

[personal contact information removed before publication]

We are in the process of looking at the 3 alternatives for the Morrisville Parkway interchange. There is an considerable amount of information from last month's public meeting on our project website; scroll down to public meetings. The study update should answer your questions and is a good reference for anyone interested in the project at your HOA.

Feel free to call me with any additional questions.

Thanks, Todd

From: *[personal contact information removed before publication]*
Sent: Thursday, March 22, 2012 9:19 PM
To: Todd Delk
Cc: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Interchange w/ I-540

Thanks Todd. Where can I sign up so I'll receive notification on future such public hearings? Can you notify me of the next hearing? Thanks.

In the document you provided, I don't see any discussion of the pros and cons associated with each design. Can you offer this detail? Why is the design "up for public discussion", isn't there a "generally accepted best practice" for such interchanges? Why isn't a full cloverleaf design presented as an option?

[personal contact information removed before publication]

From: Todd Delk [mailto:Todd.Delk@townofcary.org]
Sent: Friday, March 23, 2012 10:35 AM
To: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Interchange w/ I-540

[personal contact information removed before publication]

I added you to the contacts list yesterday, so we are good in terms of notification for future meetings.

As for your interchange questions, there is no preferred standard interchange design per se, because each interchange has particular issues and impacts.

- Full cloverleaves generally have the best traffic performance for the crossing road because left turns are eliminated. Operations on the freeway though are more problematic due to the weave area between the loops. Vehicles accelerating from the loop ramp weave into traffic, crossing over the paths of others decelerating from the freeway to get to the loop ramp.
- Full cloverleaves are typical for freeway-to-freeway interchanges.
- Full cloverleaves and diamond (full cloverleaves without the loops) create the highest impacts to property and the environment based on larger footprints. More right-of-way also means the construction costs are higher due to property acquisition.
- Partial cloverleaf options offer designs that reduce property and environmental impacts, and provide better traffic operations on the freeway, possibly with some impact in delay to crossing road.

- Diamonds and partial cloverleaves are typical for freeway-to-secondary road interchanges (such as Morrisville Parkway).

Alternative A is a diamond interchange design, with the loop ramps shown as dashed lines within to show loops could be built later if a full cloverleaf is needed.

Alternatives B and C (partial or half cloverleaves) reduce heavy property impacts on Twyla Road as well as stream impacts on the southwest quadrant. Alternative C further minimizes stream impacts in the northeast quadrant.

Our preliminary traffic analysis results show that Alternatives A and C operate at similar levels-of-service, with B operating somewhat worse.

I hope this helps offer some detail to the options. Feel free to submit your comments on the designs.

Thanks for your note and interest in the project. Have a great weekend,

Todd

From: *[personal contact information removed before publication]*
Sent: Friday, March 23, 2012 10:52 AM
To: Todd Delk
Subject: RE: Morrisville Parkway Interchange w/ I-540

Todd,

Thanks so much for the detailed response. In reviewing the options, I'm partial to Alternative A.

Since the Twyla neighborhood already exists, who has the financial responsibility to build the "connection" on this stretch of the planned Morrisville Parkway? NC DOT? If so, how realistic is it to think this will get their attention anytime soon? If it's the town's responsibility, then why hasn't a plan been initiated since the other segments appear to be "in progress" (so to speak) based upon developer activity underway.

Also, is my understanding correct that NC DOT (Toll Authority) only built a 2 lane bridge across I-540 even though the plans for Morrisville Parkway calls for a 4 lane (2 x2) separated by a median? If so, that seems awfully short sighted by NC DOT. Seems the Town would have been better served to contribute toward constructing a 4 lane wide bridge crossing now, rather than pick up some of the tab down the road when Morrisville Parkway hits gets expanded to 4 lanes…Surely, you guys have your "challenges" with NC DOT too…

By the way, whenever the bridge DOES get widened, I'd suggest some thought be given to creating enough space to incorporate a guard rail between the road and the pedestrian sidewalk. I can't believe the bridge on McCrimmon Parkway over 540 has a "skinny" 5 foot sidewalk that directly abuts the road…next to a SCHOOL where hundreds of kids walk every day. A simple slip off the curb and a kid gets hit by traffic. ESPECIALLY in proximity to a school, the sidewalk should perhaps have been 10 feet wide with space to insert a guard rail. I can't imagine that an additional bridge width of 10 feet (5 on each side) would have dramatically changed the cost equation…Very disappointing to see in "new construction". Doesn't show much foresight. Not blaming the town per se, just disappointed that the town didn't perhaps push this issue with NC DOT when the designs came out…and, if necessary, come forward with a proposal to NC DOT to pick up the extra cost to incorporate enhanced safety….Just a matter of time before a kid gets hurt (or killed)….On top of the narrow sidewalk, the drop off the curb is substantial, so anyone accidently slipping off the curb will likely fall over and roll to the ground….and out of view for an unalert driver or, worse yet, school bus….

[personal contact information removed before publication]

From: Todd Delk [mailto:Todd.Delk@townofcary.org]
Sent: Monday, March 26, 2012 10:17 AM
To: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Interchange w/ I-540

[personal contact information removed before publication]

Quick update of development along the corridor: The Fryar Tract development's rezoning was denied last week at Council, but Council seemed to have left the door open for reapplication in the near future. In addition, Twyla Road residents as a whole have applied for rezoning to Mixed Use back in January. Therefore, the possibilities for development to complete most of Morrisville Parkway in the next year or two do exist. And the Town has completed designs for the 900' section on the west side from the Greystone property to the bridge.

Bridge and Morrisville Parkway cross-section: I am not sure of the decision-making in building the 2-lane bridge. But considering the roadway is not currently constructed and NCTA included even a two-lane bridge to accommodate the first phase of Morrisville Parkway, I think the Town is very fortunate to get what has been provided. In terms of budget, the Town did not have the budget to contribute to a wider bridge.

Bridge Design for Pedestrians: Thanks for the comment, we will consider that issue when we look to widen the existing bridge or add a second in the future.

Thanks, Todd

From: *[personal contact information removed before publication]*
Sent: Monday, March 26, 2012 11:10 AM
To: Todd Delk
Subject: RE: Morrisville Parkway Interchange w/ I-540

Thanks Todd. I've long been an advocate to complete the Morrisville Parkway segment WEST of the highway (900 feet) even before the segment east of the highway "becomes a reality". Providing access on/of 540, even if only for residents west of 540 would go a long way toward improving infrastructure.

Any word on the possibility of this moving forward "sooner than later"? I really look at this as a separate actions than the segment of Morrisville Parkway east of 540…which gets bogged down in resolving Twyla, Fryer, etc. Doesn't make sense (to me) that building access to/from 540 for points west of 540 (via Morrisville Parkway) are "mixed" with the conversation about constructing Morrisville Parkway east of 540. Great if they can happen concurrently, but seems to me there's little reason not to make the "short connection" from the segment of Morrisville Parkway already constructed just west of 540. I think the Greystone developer is on board and interested in building road access to his property. Just would then need the town to step up and build the "last stretch" to connect to 540.

I'd hate to see the interchange construction (and access for those of us west of 540) to get delayed because of Twyla, Fryer etc. Interested in your thoughts, perspective and insights…

[personal contact information removed before publication]

From: Todd Delk [mailto:Todd.Delk@townofcary.org]
Sent: Tuesday, March 27, 2012 9:58 AM
To: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Interchange w/ I-540
[personal contact information removed before publication]

At this point, the timing of the construction of the roadway segments and the interchange is unknown. Neither the interchange nor any part of the roadway are in our immediate capital budget.

We understand the desire of residents in western Cary to have better access to NC 55 and points east, as well as to future NC 540. But until we have a preferred alternative for the interchange AND an idea of potential funding and schedule for its construction, questions about development and timelines will remain unanswered and hypothetical.

Hence the importance of the interchange study we are currently conducting. We need to answer the questions of "What we are going to do?" and "How we are going to pay for it?" before we can answer "When, and in what order, are we going to do it?".

Thanks, Todd

From: *[personal contact information removed before publication]*
Sent: Tuesday, March 27, 2012 12:27 PM
To: Todd Delk
Subject: RE: Morrisville Parkway Interchange w/ I-540

Thanks Todd. Understand. Hopefully we'll get a chance to meet @ the next public meeting. Thanks for all you do…

[personal contact information removed before publication]

Email Discussion with Cary Citizen, June 7, 2012

From: *[personal contact information removed before publication]*
Sent: Thursday, June 07, 2012 9:05 PM
To: Todd Delk
Subject: Morrisville Parkway connection timeframe?

Hi Todd,

I live in Cary and was wondering if there is an estimated timframe of the completion of Morrisville Parkway from Hwy 55 to Green Level Church Road and including the interchange at 540?

Thanks for your help.

[personal contact information removed before publication]

On Jun 8, 2012, at 9:30 AM, Todd Delk wrote:

[personal contact information removed before publication]

Thanks for your question.

We are currently working away on that project. For more details, you can go to the Town project website(http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm).

The Town currently is doing the planning, environmental, and design work for Morrisville Parkway Extension and an interchange with NC 540. While there is no set timeframe for the projects' construction, there is a lot of activity going on that seems to point to it being completed sooner than later (refer to the map of the website):

- The development of Highcroft Village has already started and they are in the process of finalizing designs so they can build Morrisville Parkway from NC 55 west to the edge of their development (2-lane, median-divided to start as part of their development approval).
- The Fryar tract is in the process of site review presently, and the Town has begun discussions with them to hopefully get their development to extend the road to the NC 540 bridge (already built based on an agreement between the Town and NC Turnpike Authority).
- The Twyla community has submitted a rezoning request and it currently evaluating redevelopment opportunities as well. The requirements for their development approval per Town Adequate Public Facilities for Roads ordinance will be somewhat dependent on Fryar tract, but may include funding or construction help with the western section or the interchange.

If the eastern section is completed/looks to be completed in the near future, the hopes would be that the Town would work with Greystone to complete the section between Green Level Church and NC 540 concurrently or shortly thereafter. The interchange though is still under design, but we are finalizing the environmental document by this fall so that we can begin discussion with the Turnpike Authority and other developers about private-public partnerships to add the interchange within the next few years.

Currently, in the Town Manager's recommended FY 2013 budget to Council (see page 7), the assumption is:

- Morrisville Parkway will be completed as two-lane road by developers before or during Fiscal Year 2016 (July 2015-June 2016),
- The Town will build the NC 540 interchange in partnership with NC Turnpike Authority and possible developers in FY 2016.

- The Town will begin the construction project to widen Morrisville Parkway to the full 4-lane median-divided section in FY2020.

Please note that this budget is still preliminary and has not been approved by Council. They have their final Budget Work Session on Monday June 25 (5:30pm) and will discuss and vote on the budget at their June 28 meeting (6:30pm).

I hope this helps. Keep up with the project at the Town website, and I will add your name to the email list for when we send out updates and announcements about public meetings.

Thanks, Todd

Todd B. Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Dept.
316 N. Academy Street
PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

From: *[personal contact information removed before publication]*
Sent: Fri 6/8/2012 1:45 PM
To: Todd Delk
Subject: Re: Morrisville Parkway connection timeframe?

Todd,

Thanks very much for the info. It was very helpful. The connection the the Parkway plus the 540 exchange will be a huge benefit to West Cary. Thanks also for adding me to any updates.

-*[personal contact information removed before publication]*

Email Discussion with Cary Citizen, June 18, 2012

From: *[personal contact information removed before publication]*
Sent: Monday, June 18, 2012 11:17 AM
To: Todd Delk
Subject: Morrisville Parkway Study comments

Todd -

Found your name on the Town website - very interested in the progress of the Morrisville Pkwy. extension to Green Level - do you have any wild idea of timing (or for that mater likelihood) that the project will start/ complete? (Lots of folks in Cary Park/ Weldon Ridge would benefit from that extension, and access to 540!)

Thanks,

- *[personal contact information removed before publication]*

From: Todd Delk
Sent: Monday, June 18, 2012 11:57 AM
To: *[personal contact information removed before publication]*
Subject: RE: Morrisville Parkway Study comments

[personal contact information removed before publication]

Thanks for your question.

As you noted, the Town is currently working away on that project. To stay informed with the study, you can look for updates on the Town project website (http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm).

The Town currently is doing the planning, environmental, and design work for 1) Morrisville Parkway Extension and 2) its interchange with NC 540. While there is no set timeframe for the two projects' construction, there is a lot of activity going on that seems to point to it being completed sooner than later (refer to the map of the website):

- The development of Highcroft Village has already started and they are in the process of finalizing designs. When they start the next phase of the development, they will build Morrisville Parkway from NC 55 west to the edge of their development (2-lane, median-divided to start as part of their development approval and permits previously obtained by the Town).
- The Fryar tract is in the process of site review presently, and the Town has begun discussions with them to hopefully get their development to extend the 2-lane road to the NC 540 bridge (already built based on an agreement between the Town and NC Turnpike Authority).
- The Twyla community has submitted a rezoning request and is currently evaluating redevelopment opportunities as well. The requirements for their development approval per Town Adequate Public Facilities for Roads ordinance will be somewhat dependent on Fryar tract, but may include funding or construction help with the western section or the interchange.

If the eastern section is completed/looks to be completed in the near future, the hopes would be that the Town would work with Greystone to complete the western section between Green Level Church and NC 540 concurrently or shortly thereafter.

The interchange is still under design, and we are finalizing the environmental document by this fall. We hope to begin discussions with the Turnpike Authority and other developers about private-public partnerships to add the interchange within the next few years.

Currently, in the Town Manager's recommended FY 2013 budget to Council (see page 7), the assumption is:

- Morrisville Parkway will be completed as two-lane road by developers before or during Fiscal Year 2016 (July 2015-June 2016),
- The Town will built the NC 540 interchange in partnership with NC Turnpike Authority and possibly developers in FY 2016.
- The Town will begin a construction project to widen Morrisville Parkway to the full 4-lane median-divided section in FY2020.

Please note that this budget is still preliminary and has not been approved by Council. They have their final Budget Work Session on Monday June 25 (5:30pm) and will discuss and vote on the budget at their June 28 meeting (6:30pm).

I hope this helps. Keep up with the project at the Town website, and I will add your name to the email list for when we send out updates and announcements about public meetings.

Thanks, Todd

Todd B. Delk, P.E.
Transportation Planning Engineer

Town of Cary Engineering Dept.
316 N. Academy Street
PO Box 8005, Cary NC 27512
919.462.3834 (919.460.4935 fax)
todd.delk@townofcary.org

Public Hearing Comments

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Public Hearing Comments

The Town of Cary, in conjunction with NCDOT and FHWA, held a Design Public Hearing on November 6, 2013, at Cary Fire Station #8 (408 Mills Park Drive) from 4:30 - 7:30 p.m. The Town shared the design drawings for Phase I and II of the Morrisville Parkway Extension Improvements and NC 540 Interchange, detailing the preferred alternative using Interchange Option C (partial clover interchange with ramps in northwest and southeast quadrants). The Town also had a slideshow running with project details and the findings of the environmental assessment document.

Town staff made short summary presentations at 5:30 and 6:30 p.m. to the public, outlining the project history and progress, the status of the NEPA documents, and the anticipated project schedule based on existing Town funding and potential state and federal funding sources. Town, consultant, NCDOT and FHWA project staff were introduced during the presentation. After the short presentation, the Town's project manager Todd Delk took questions and comments from the public in attendance.

5:30 Comments

A citizen asked about the phasing of the project and when the interchange would be built.

Town staff explained the phasing as follows:

- the extension is under construction by developers and is scheduled to be completed by the Town,
- the schedule for the interchange is in question but could potentially be built when NCTA offers its next set of bonds, presumably in 2018 with the construction of the Triangle Expressway Southeast Extension, and
- the four-lane widening will occur when traffic determines it is needed

A citizen asked about improvements/widening to Morrisville Parkway/Lewter Shop Road west of the project

Town staff explained the widening west of Green Level Church Road is not part of this project.

A citizen asked about the timing when Morrisville Parkway would be connected at NC 55.

Town staff confirmed it is part of this project.

A citizen asked about estimated costs for construction and what is included.

Town staff explained that the cost estimate for the extension alone is approximate $5-6 million and with the interchange the cost increases to approximately $10 million. Staff explained the additional expenses include the interchange roadway construction, tolling equipment, freeway signage, and other tollway-related expenses.

A citizen asked about whether the extension could be built without the interchange.

Town staff explained that town is currently working on the assumption that the extension will be built without the interchange and that sequencing is likely to build the interchange at a later date.

A citizen asked about the existing interchanges in Cary along NC 540, what the spacing is between them, and whether an interchange was needed at Morrisville Parkway.

Town staff stated that the spacing between the existing interchanges at Green Level West Rd and NC 55 is 4 miles, and that typical spacing in suburban areas is 2 miles, while 1 mile is typical in urban settings.

Town staff explained that the interchange was planned in I-540 designs, but was pulled for construction plans when 540 changed to toll road. Staff stated that the interchange would have likely been built with NC 540 had Morrisville Parkway been constructed before or in tandem with the tollway.

NCDOT staff made note that public hearing is not the only time to make comments and asked for town staff clarify other ways to submit comments.

Town staff concurred and stated comments could be made on comment sheets at meeting or sent it via mail or email through Dec. 5 for meeting. Staff also explained that the public would have opportunity to comment on EA during a 30-day comment period after it was approved by NCDOT and FHWA and posted to Federal Register.

6:30 Comments

A citizen asked about the proposed funding source for the project and whether it is Town tax dollars or bond money.

Town staff explained that the developers were funding and constructing their portions. The final piece of the extension has $3.5 million in construction funding shown in the Town's Capital Improvement Plan (CIP) in FY16, and the Town is looking to use that money to leverage state/fed funding or other developer monies to complete the roadway. Staff noted that the CIP is the budgetary plan but that the town budget is only set for the current year, and the future funding would need to be included and approved by council in the year planned.

Town staff stated that the town is looking to the NC Turnpike Authority (NCTA) to fund the interchange, and that funding for the future widening is yet to be determined since it is further out in the schedule.

A citizen asked for the presentation slide showing traffic increases to be explained.

Town staff showed the traffic volume slide with 2010 and 2035 forecast traffic numbers and explained the figure.

A citizen asked about presentation covering relocations and noise impacts.

Town staff showed the expected relocations on the Phase II map.

Town staff discussed the noise impact analysis and showed impacted homes based on full build-out on the Phase II map.

Another citizen asked about the impacts at the Greystone community.

Town staff explained the projected noise impacts are right at the threshold with full build-out.

The same citizen expressed concerns about noise levels in the near term with the extension and Phase I improvements.

Consultant staff discussed that the impacts are based on the 2035 build-out but there will likely be increased noise in the interim, but that the full build-out is the point it reached the threshold levels.

The same citizen expressed concerns about the new traffic around the Greystone subdivision with children crossing the roads to get to the pool and community center, even with the pedestrian underpass of Morrisville Parkway, and asked when the connection would be in place.

Town staff stated that the current expectation is that construction could start in 2016.

The same citizen expressed concern about traffic control at Green Level Church/Morrisville Parkway intersection, asked whether a roundabout was considered instead of a signal, and expressed concerns about speeds coming down the hill on northbound Green Level Church Rd. and the potential for motorists to run the red light. She noted two crashes that have occurred at the intersection recently.

Town staff stated that only a traffic signal had been looked at for the intersection. Consultant staff stated that it would need a multi-lane roundabout based on the four-lane roadway approaches and volumes. Town staff stated that the signal is part of the project and may be installed earlier than the project construction.

Town staff offered to discuss the noise impacts and future mitigation and project more with citizen and the Greystone homeowners association

The same citizen expressed complaints about the current construction practices (impacts to a HOA property, working hours, and noise) and noted that complaint had been filed with the Town.

Town staff noted that the construction work was being done by the developer and not the Town or NCDOT and offered to help follow up on the complaint with Town staff.

The same citizen expressed concerns about the lack of buffers with current townhomes backing up to Morrisville Parkway and noted that developer told them the roadway would only be two-lanes, have no interchange, and no interchange was planned.

Town staff apologized if developer wrongly informed home buyers, but noted that interchange has been in Town's plans since 2001, and always been planned for Morrisville Parkway. Town staff stated that the extension was a part of the development site plan for the Greystone community and always planned for an ultimate 4-lane section in future. Town staff again offered to follow-up with the citizen and the Greystone HOA as the final design progressed and became more defined.

Written Comments

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

There are 2 large perennial streams in the corridor_ one near the east side by Greystone and one near the west side by Highcroft. Both should use bridge crossings instead of culverts in order to accomodate greenway paths that travel under the road. This will improve crossing safety as the greenway paths will connect housing areas with two schools, Town park facilities, USA Baseball, and is a connection to the shopping center on Green Level Church Road.

If culverts are used they will potentially not meet future FEMA no-rise requirements for the second set of lanes. The proposed new residential will add impervious drainage that will shed into these two perennial streams and a culvert will eventually contribute to channel erosion.

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

Excellent idea. Thank you for providing an easier access to 540 for the Carry Park residence without having an exit on Carpenter fire station. The conventional intersection seems to be the easiest access but more $ & time. So any of these options should be good.

I am sure you will provide sound barriers for Graystone residence.

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

Please Copy To: Todd Delk.

4 concerns for West Cary traffic:

1. Amount of toll for new I-540 & Triangle Expressway
2. Morrisville Parkway being only 2 lanes west of NC-55
3. Need to widen Green Level Church Rd from O'Kelly Chapel Rd. to NC-64.
4. Widen & straighten O'Kelly Chapel Rd; very dangerous (especially with Tobacco Trail crossing)

These will solve 90% of West Cary traffic problems.

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

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My preference is the Diamond Interchange, but anyone of them will be fine.

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

- The roundabouts at the 540 interchange are a BAD idea. Please use the other option.
- Prefer Alt. A, Diamond interchange with the alternate intersections (i.e. without the roundabouts)

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

Bicycle and walking paths are very important - please make sure these are included.

Thank you

An exchange on 540 is very important and supported by CP board. Our

NC 540/Morrisville Parkway Interchange Study

Citizens Workshop - February 28, 2012

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

PREFERENCES IN ORDER

#1 - DIAMOND

#2 - PARTIAL B CLOVERLEAF

#3 - PARTIAL C CLOVER LEAF

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

Items of Concern Greystone

- Too much noise from traffic
- A stoplight will not be [illegible] right now than a roundabout
- We need a way to safely allow

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

This project spends TOC taxpayer dollars for a facility that can not be used until some date in the future whenever a developer comes forward with a project that will connect two new road sections that are roads to nowhere right now. Instead of the ~~$100s of~~ thousands spent on this project it would be nice to have park facilities for the communities here in NW Cary. We have a tennis park for tennis players a baseball park for baseball players but nothing that the general community can use. What about a Bond Park type of facility? a dog walk park? a KIDS Together type of park? I think the TOC has not served the community well or taken fiduciary responsibility in how taxpayers money is spent in this part of Cary.

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

Disappointed that road is not funded or will not be operational sooner. Road and ramp to 540 is needed now!

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

will there be a crosswalk at main road of Highcroft development? Looks like that is 1/4 mile from ped underpass.

willthere be noise absorbing features between Morrisville Pkwy and Highcroft development?

Will developers build the sidepath? Will it be on north or south side?

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

I will be glad to see this interchange approved and built. It will help West Cary.

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

NC 540/Morrisville Parkway Interchange Study

Design Public Hearing & Workshop – November 5, 2013

Comment Sheet

Please provide comments, questions, and concerns below.

If you would like be contacted in the future regarding changes or updates to these projects, please provide your name and contact information at the bottom of the page.

I'd really encourage getting the interchange installed ASAP. & 540 would get more use due to easier access west of 540 (by not having to cross 55). There's a large population in West Cary near this intersection.

Send comments by **December 5, 2013** to Todd Delk, Town of Cary Engineering, 316 N Academy St., Cary NC 27513 or todd.delk@townofcary.org.

Twyla Road Comments

March 27, 2012

Todd Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Department

Subject: Feedback on NC540/Morrisville Parkway Interchange
Town of Cary Project Number – ST 1123

Dear Mr. Delk

Thank you and your team for the informative Citizen Workshop on February 28th to provide information and solicit public comments on the proposed interchange of Morrisville Parkway and NC540. Thanks also for the ongoing conversations we've had about project schedule, phasing, parcel access and land use considerations related to the design and construction of the proposed interchange in coordination with the successful redevelopment of our Twyla Road neighborhood.

In response to the Town of Cary's request for comments on the three design options for the interchange, this letter is to state the unified preference of 31 property owners for Interchange Option 3 with roundabouts. Our comments here and in the attached diagram and letters will refer to this option, along with additional access provisions we feel are key to the coordinated redevelopment of our 73+ acre Twyla tract as Option C (rev). Interchange Options A and B create untenable impediments to viable redevelopment of our land and are therefore unacceptable.

In response to the impending realities of Cary's growth, the property owners on and adjacent to Twyla Road have taken the unprecedented step of forming the Twyla Group LLC, whose sole purpose is to facilitate the orderly and complete redevelopment of their neighborhood in a way that benefits both the Town of Cary and the Twyla Group LLC. Please see the attached 31 signed LLC member letters describing the challenges they face and the opportunity for achieving mutual objectives.

In pursuit of this critical partnership with Cary, the LLC has engaged a number of the most creative and experienced development planning and engineering consultants available. The attached diagram of interchange Option C (rev) represents our consultants' best effort to combine the strategic and technical goals of Cary and the LLC in selecting the best interchange design.

Thank you again for your efforts and the efforts of the Town of Cary to engage, listen and work together with the Twyla Group neighborhood. We are encouraged and look forward to a successful partnership.

Sincerely,
Dave Dayton, Vicki Smith, Russ Stephenson
Twyla Group LLC managers

Support Letters for Option C (rev) from The Twyla Group LLC Members

PROPERTY OWNER	COUNTY PARCEL NUMBER	REAL ESTATE ID	DEEDED ACREAGE
Davenport, Patricia	0734286448	0105925	2.10
Dayton, Carol	0735209448	0129571	5.20
Dayton, Dave	0735209448	0129571	5.20
Gilbert, Debbie	0734390881 / 0734392943	0155314 / 0155315	2.25 / 2.61
Gilbert, Lawrence	0734390881 / 0734392943	0155314 / 0155315	2.25 / 2.61
Hilliard, Annie Ruth	0734392007	0031006	14.19
Hilliard, Craig	0734282466	0138571	1.54
Hilliard, Todd	0734380591	0199505	3.50
Holly, Barbara	0734294807	0100217	1.50
Jones, Catherine	0735209740	0105901	4.88
Jones, Destry	0735209740	0105901	4.88
Kearns, Elizabeth	0735209159	0105972	5.60
Kearns, Talbert	0735209159	0105972	5.60
Olive, Winifred G.	0735203489	0105971	2.50
Posson, Kristin	0735217059 / 0735209946	0101553 / 0135034	0.52 / 4.60
Posson, Steve	0735217059 / 0735209946	0101553 / 0135034	0.52 / 4.60
Rogers, Clinton	0734283875	0138570	1.66
Rogers, Shannon	0734283875	0138570	1.66
Rogers, Milton	0734294217	0105927	3.40
Rogers, Rita	0734294217	0105927	3.40
Smith, Michael	0734297619	0105973	3.75
Smith, Vicki	0734297619	0105973	3.75
Longino, Ellen	0734297234	0105923	3.75
Stephenson, Russell	0734297234	0105923	3.75
Swingle, Sandra	0734294615	0100216	1.50
Weldon, Kristel	0734286728	0127862	2.00
Weldon, John	0734286728	0127862	2.00
Wiggins, Elizabeth	0734288739	0141667	2.00
Wiggins, James	0734288739	0141667	2.00
Young, Ellan	0735203991	0105900	4.26
Young, Melissa	0735203991	0105900	4.26

31 copies of this letter signed by all 31 Twyla Road property owners were attached to the Twyla Group's letter with comments

March 27, 2012

Todd Delk, P.E.
Transportation Planning Engineer
Town of Cary Engineering Department

Subject: Feedback on NC540/Morrisville Parkway Interchange
Town of Cary Project Number – ST 1123

Dear Mr. Delk,

As a member of The Twyla Group LLC, I support Interchange Option C with a few requests as described in the attached cover letter and diagram. This is a slightly modified version of Option C presented by the Town of Cary at the February 28 Citizen Workshop, which we will refer to as Option C (rev).

Interchange Options A and B create untenable impediments to viable redevelopment of our land as part of the Twyla Group LLC tract, and are therefore unacceptable.

Interchange Option C (rev) provides the best opportunity for successful redevelopment of The Twyla Group's 73+ acre tract in concert with Cary's Southwest Area Plan transportation and commercial development objectives: "*Encourage mixed-use, infill development, especially in the I-540/ NC 55 corridor*" and "*Acknowledge high value of land adjoining thoroughfares and near interchanges; focus commercial development near them.*"

I have enjoyed living among the families who built homes on Twyla Road, but we have increasingly found ourselves in the crosshairs of western Wake growth — with the Turnpike Expressway nearing completion on our western border, an attached-unit PUD approved on our eastern border, and now the Morrisville Parkway planned to divide Twyla Road in half.

The access provided by Interchange Option C (rev) to The Twyla Group assemblage is our last best chance to recover from the advancing forces isolating and dividing our neighborhood and the associated decline in value of our life investments.

I respectfully urge you to support the efforts of The Twyla Group to deal with the dissolution of their neighborhood in a way that prepares the ground for a new development supporting Cary's goals for the future and in doing so, allows the Twyla Road residents to start over. Please recommend Interchange Option C (rev).

Sincerely,

Project Newsletter

Comments or Questions?

Contact the Town's project manager with any questions or comments:

Todd Delk, P.E.
Town of Cary Engineering Department
(919) 462-3834
todd.delk@townofcary.org

Next Steps for Morrisville Parkway and NC 540 Interchange

- **Citizens and stakeholders should fill out a comment sheet to let us know your thoughts.**

  Let the Town and its project staff know what you think about the information presented here. Also note any concerns or issues you think should be addressed during the study.

  Please provide the Town with your contact information so that we can keep you informed about the study and any updates on its progress.

- **Town staff and the project team will evaluate designs, environmental data, agency comments, and citizen input and make recommendation for Cary Town Council to select a Preferred Alternative.**

  After evaluating the designs, estimated costs, impacts, and feedback, Town staff will prepare a staff report for Town Council and make a recommendation for a Preferred Alternative to carry forward in the design process.

- **The project team will prepare the Environmental Assessment (EA) document.**

  The project consultants will summarize the environmental and community impacts in the EA document to fulfill NEPA requirements for the project.

- **The Town will conduct a Public Hearing in late summer for citizen input.**

  The Town and NCDOT will hold an open forum for review of the project designs and EA findings and provide an opportunity for the public and review agencies to comment.

TOWN OF CARY
ENGINEERING DEPARTMENT
316 N Academy St.
Cary, NC 27513
919.469.4030 ph
919.460.4935 fax
www.townofcary.org

TOWN OF CARY
ENGINEERING DEPARTMENT

Study Updates

February 2012

contents

Schedule for Morrisville Parkway Extension

Currently, there is no expected date for the completion of the Morrisville Parkway extension or the interchange. The design and environmental study will help the Town determine project cost estimates, funding opportunities, and a construction timeframe.

INTERCHANGE STUDY
Fall 2012 -
Preliminary designs and environmental document

Fall 2013 -
Final design

INTERCHANGE
To be determined -
The NC Turnpike Authority and the Town will determine funding and timing for the interchange after the preliminary engineering is completed.

MORRISVILLE PARKWAY
As development occurs -
Two-lane roadway from NC 55 to NC 540 bridge to Green Level Church Rd.

To be determined -
Widening to four-lane roadway with wider NC 540 bridge

Cary Works to Connect Morrisville Parkway

The Town of Cary is working with local developers and the NC Turnpike Authority to complete the last 1.83-mile segment of the Morrisville Parkway corridor from NC 55 to Green Level Church Road with a planned interchange at NC 540 (Western Wake Expressway).

The project will be constructed initially as a two-lane road, and later widened to four lanes when traffic demands necessitate the widening.

Status

Western Segment: From Green Level Church Road to west of the NC 540 interchange – The Developer of Greystone PUD is responsible for constructing a two-lane portion from Green Level Church Road to 900' from the bridge. The Town of Cary has designed the remaining 900-foot two-lane section to the bridge.

Bridge and Interchange at NC 540 – The NC Turnpike Authority has completed the construction of the Morrisville Parkway Bridge as part of their Western Wake Freeway project.

In September 2011, the Town began the study to design and provide the environmental documentation needed to move the NC 540 interchange forward. The project is reevaluating interchange configurations and intersections based on project costs, impacts, and tolling. The study is expected to take 12 months and will be followed by final design of the interchange.

Eastern Segment: From NC 540 interchange to NC 55 – The Town is working with two developers to complete the eastern segment. Instead of building the proposed four-lane segments across each of their properties, the Developers look to a longer piece of two-lane roadway beyond their properties so that the roadway connection can be completed earlier.

The Developer of Highcroft Village (Phase 4 & 5) has developed plans to construct a two-lane portion from NC 55 to the western edge of their development. The rezoning and site plans have been approved and construction should begin some point in the near future.

The Developer of Fryar Tract is currently in the rezoning process. Current Town development requirements would require the developer to construct the portion of Morrisville Parkway across their development.

Currently, there is no expected date for the completion of the Morrisville Parkway extension or the interchange. The design and environmental study will help the Town determine project cost estimates and a construction schedule.

TOWN OF CARY

HISTORY

2003-04

- Town of Cary performs study and selects planned alignment from 5 alternatives
- Town holds workshops on June 29, 2004 and September 21, 2004 second workshop for citizens' input
- Town Council selects Alignment B with Loops

2006

- Town completes 25% design plans for extension and interchange

2007

- Town applies for Section 404 wetland and stream impacts permit

2008

- NC Turnpike Authority takes over I-540 project
- NCTA determines they will not build interchange but will build two-lane bridge
- US Army Corps of Engineers approve Section 404 permit
- Permit stipulates construction of 2-lane roadway first to minimize impacts but allows widening when traffic conditions warrant

2010

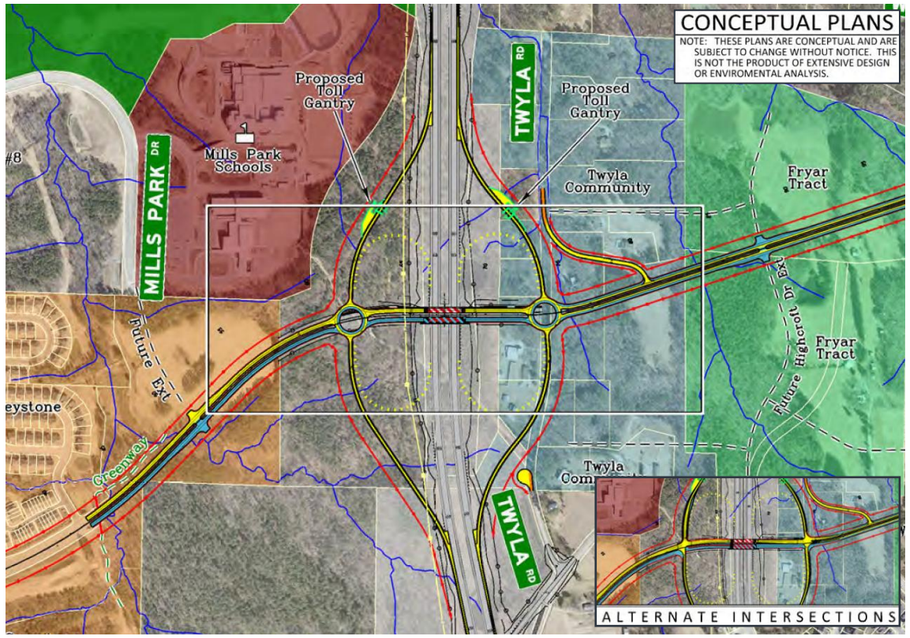
- Town wins grant to reevaluate interchange designs and perform environmental documentation needed to construct interchange
- Town Council approves recommendation for Highcroft development to construct 2-lane extension west from NC 55 halfway to NC 540 as part of improvements for subdivision approval
- Council agrees to use same method for development being considered between Highcroft and NC 540

2011

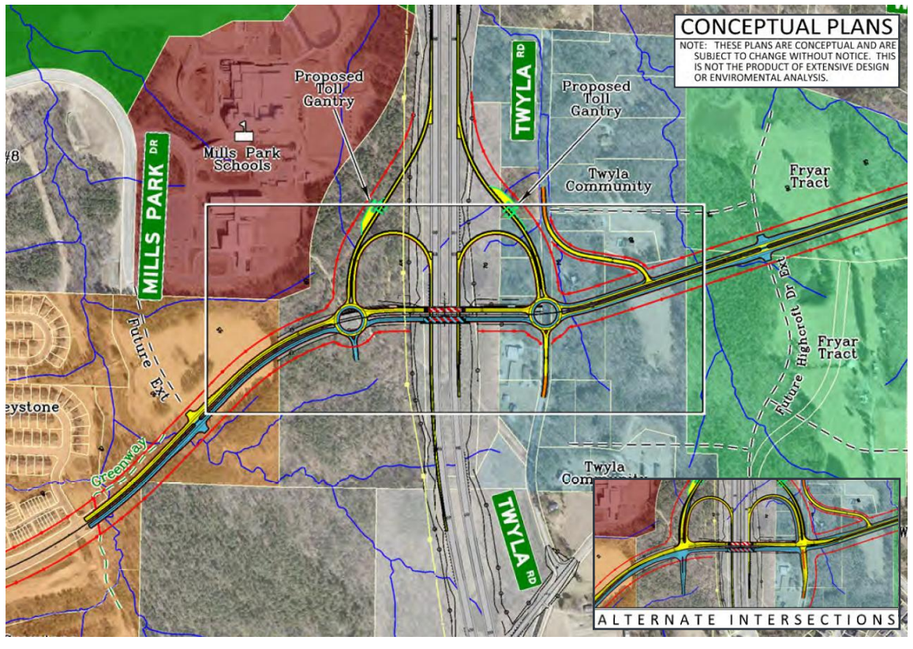
- Town completes full design for 900' segment west of bridge to Greystone PUD
- NCTA constructs Morrisville Parkway bridge
- Town starts functional interchange design and environmental study

Preliminary Interchange Concepts for NC 540 Western Wake Freeway at Morrisville Parkway

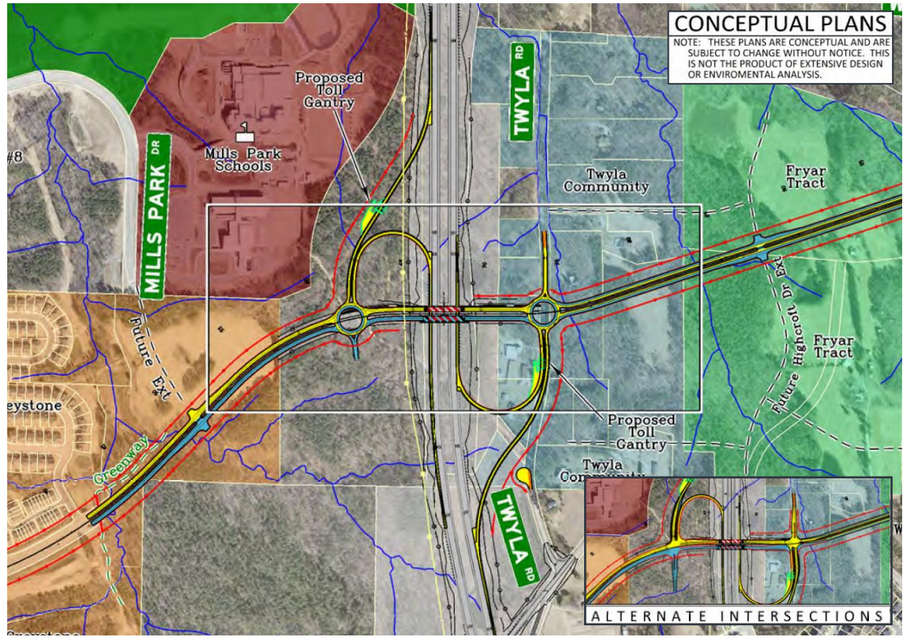
Alternative A: Diamond Interchange



Alternative B: Partial Cloverleaf – North Side



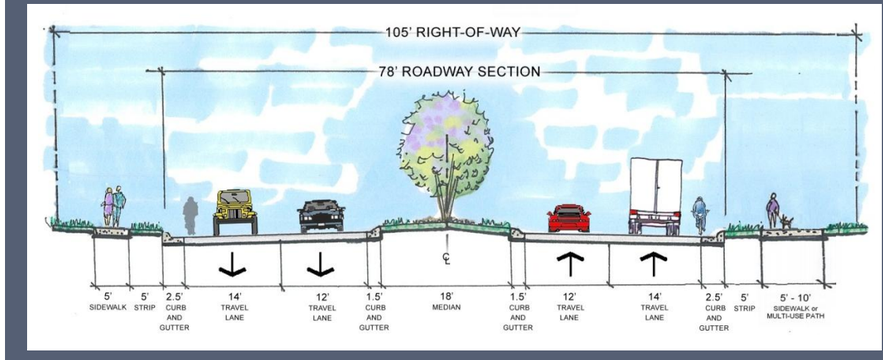
Alternative C: Partial Cloverleaf – NW/SE Diagonal



The alternatives presented here are only concepts for discussion and may not represent the future preferred alternatives. The options show three interchange designs developed in consideration of numerous issues, including but not limited to safety, traffic operations and capacity, environmental issues, and community impacts and access.

For each alternative, the concepts consider two options for the intersections at the interchanges ramps: roundabouts and conventional intersections. The roundabout intersections have been considered as a way to postpone widening the newly-constructed two-lane bridge until the road is widened to four lanes. Conventional intersections (signalized or unsignalized) may require turn lanes where the required storage lengths would be restricted by the current bridge width.

Typical Cross-Section for Morrisville Parkway



WHAT IS NEPA? Environmental Documentation for Projects

The development of roadway projects with federal funding requires planning be done in accordance with the National Environmental Policy Act (NEPA). NEPA is a federal law enacted in 1970 that requires governments to consider the environmental impacts of, and alternatives to, major proposed actions in its decision-making processes. The act is the basic national charter for the protection of the environment.

For this project, an environmental assessment (EA) has been prepared and will be reviewed by NCDOT and Federal Highway Administration (FHWA). The EA includes identification of the project's purpose and need, documentation of the potential alternatives, comparison of each alternative's environmental impacts, and coordination with the public and regulatory agencies.

STUDY BUDGET

The Town is funding the current study through two grants received from the Capital Area Metropolitan Planning Organization (CAMPO) Locally Administered Project Program (LAPP).

FY 2012 - $325,000 for interchange study
$260,000 from STP-DA grants, $65,000 from Town funds

FY 2013 (Proposed) - $750,000 for final design
$600,000 from STP-DA grants, $150,000 from Town funds

Comments or Questions?

Contact the Town's project manager with any questions or comments or for additional Public Hearing information:

Todd Delk, P.E.
Town of Cary Engineering Department
(919) 462-3834
todd.delk@townofcary.org

Notice of Design Public Hearing

Tuesday, November 5, 2013, 4:30-7:30 PM

Cary Fire Station #8
480 Mills Park Drive

The Town of Cary invites you to attend our Design Public Hearing on the Morrisville Parkway project. **Citizens are encouraged to attend to review project maps and get details on the environmental study. Members of the project team including Town and NCDOT staff will be available to answer questions and receive comments.** Interested individuals may attend this public hearing any time during the above hours. The project team will make a short summary presentation on the project at 5:30 and 6:30 PM.

A map displaying the location and design of the project are available for public review at the Town of Cary Engineering Department located at 316 N. Academy St. in downtown Cary. The map may also be viewed at the Town's project website: http://www.townofcary.org/Departments/Engineering/Streets_and_Sidewalks/Streets_Projects/morrisvillepkwy.htm

The Town and NCDOT will take all input into consideration as work on the project progresses. Public comments will be recorded, included, and addressed in project documentation for the final document.

The Town will provide auxiliary aids and services under the Americans with Disabilities Act for disabled persons who wish to participate in this hearing. Anyone requiring special services should contact Todd Delk (contact information to left) as early as possible so that arrangements can be made. Persons who have a limited ability to read, speak, or understand English may call Town of Cary Public Information Office at 919-481-5091 prior to the hearing to request assistance.

Las personas que tienen una capacidad limitada para leer, hablar o entender el Inglés pueden solicitar servicios de interpretación antes de la reunión ya sea llamando 1-800-481-6494.

Next Steps for Morrisville Parkway Extension and Interchange

- **Citizens and stakeholders should fill out a comment sheet to let us know your thoughts.**

  Let the Town and its project staff know what you think about the information presented here. Also note any concerns or issues you think should be addressed during the study. Please provide the Town with your contact information so that we can keep you informed about the study and any updates on its progress. Please provide you comments to project manager Todd Delk by November 30.

- **Town staff and the project team prepare the Finding of No Significant Impact (FONSI).**

  Town staff will evaluate the designs, estimated costs, impacts, environmental data, agency comments, and citizen input in order to make a recommendation for a Preferred Alternative to carry forward in the design process.

- **The project team will develop the roadway plans through final design phase.**

  Upon approval by NCDOT and the Town, the project consultants will move forward with the design process and work to develop construction documents for the project. Final designs should be complete by next fall.

- **The Town will move forward to secure the funding and construction of Morrisville Parkway Extension.**

  The Town has funds for right-of-way acquisition in the current fiscal year's budget for the extension project. The Town is currently working to secure additional funding to cover the full construction costs of the project.

- **The Town will work with NCDOT, NC Turnpike Authority, and developers to construct the interchange.**

  The Town has continued to coordinate with NCDOT and NC Turnpike Authority to determine ways to fund the construction of the interchange. The Town is currently working to identify funding partnerships and timeframes to construct this important interchange.

Town of Cary

October 2013

Study Updates

Morrisville Parkway Extension and NC 540 Interchange

PROJECT SCHEDULE

Currently, there is no confirmed date for the completion of the Morrisville Parkway extension or the interchange. The following timeline outlines the current schedule based on the study and the Town's Capital Improvement Program, but may change based on factors out of the Town's control.

INTERCHANGE STUDY
Fall – Winter 2013
Final EA and Finding of No Significant Impact (FONSI)

Winter 2013 – Fall 2014
Final Design

MORRISVILLE PARKWAY
As development occurs / 2016 (if funding is available) -
Two-lane roadway from NC 55 to NC 540 bridge to Green Level Church Rd.

2022-23 (if funding is available) -
Widening to four-lane roadway with wider NC 540 bridge if traffic conditions deem it necessary

INTERCHANGE
With new NC Strategic Transportation Investment legislation, funding for the interchange is unclear. The Town will continue to pursue partnerships & opportunities to construct this priority interchange.

Stay updated on the project's progress at the Town's website (http://www.townofcary.org) on the Engineering Department's Street Projects web-page, or use this QR code to go directly to the project website.

contents

Interchange Design Selected for Morrisville Parkway

The Town of Cary began working last two years to develop the designs and environmental documentation for **Morrisville Parkway from NC 55 to Green Level Church Road.** This 1.83-mile segment includes **the planned interchange at NC 540 Western Wake Freeway.** Cary citizens were able to see the preliminary concepts at a public workshop held in February 2012 and provided the project team with numerous comments and insights.

Project Status

The Town has finalized the preliminary designs and drafted the Environmental Assessment (EA) document for Morrisville Parkway Extension and the NC 540 Interchange. The document outlines the project details and impacts and fulfills the requirements of the National Environmental Policy Act (NEPA). The EA will be posted to the Town website for public review upon its approval by the Federal Highway Administration (FHWA) and NCDOT.

Key items addressed in the document include:

Purpose and Need: The purpose of the proposed project is **providing increased connectivity and access, as well as additional roadway capacity, within western Cary.** The extension currently in progress will address the existing deficiency in the connectivity of segments of existing Morrisville Parkway, while the interchange will provide Cary travelers better access to NC 540 than the current interchanges located at NC 55 and Green Level West Road. The four-lane widening will provide added capacity to the area roadway network, relieving projected congestion on NC 55 and Green Level Church Road.

Alternatives Considered: A full range of alternatives, including the No-Build Alternative, Alternative Modes of Transportation, Transportation Systems Management (TSM) Alternative, Improve Existing Facility Alternative, and new location Build Alternative were evaluated for the proposed action. The Build Alternative represents the recommended alignment from the 2003-2004 corridor study and permitted by the US Army Corps of Engineers and NC Division of Water Quality in 2008. The Build Alternative includes the evaluation of three interchange designs.

Preferred Alternative: The Build Alternative is recommended, with Interchange Option C—the construction of **a partial cloverleaf interchange at NC 540 with ramps and loops in the northwest and southeast quadrants**.

Summary of Impacts: The main impacts include the relocation of 7 residences, 6 stream crossings with a combined length of 2,825 feet, 4 wetland areas of a combined 0.44 acres, 87 acres of forest impacts, and 9 residences where noise impacts would need to be mitigated.

Preferred Design for Morrisville Parkway Extension and NC 540 Interchange

Option C: Partial Cloverleaf Interchange – Northwest and Southeast Quadrants

WHAT IS NEPA?
Environmental Documentation for Projects

The development of roadway projects with federal funding requires planning be done in accordance with the National Environmental Policy Act (NEPA). NEPA is a federal law enacted in 1970 that requires governments to consider the environmental impacts of, and alternatives to, major proposed actions in its decision-making processes. The act is the basic national charter for the protection of the environment.

For this project, an environmental assessment (EA) has been prepared and is being reviewed by NCDOT and Federal Highway Administration (FHWA). The EA includes identification of the project's purpose and need, documentation of the potential alternatives, comparison of each alternative's environmental impacts, and coordination with the public and regulatory agencies. When the interagency review of EA is completed, a FONSI is issued if the project to have no significant impacts on the quality of the environment.

STUDY BUDGET

The Town is funding the current study through grants received from the Capital Area Metropolitan Planning Organization (CAMPO) Locally Administered Project Program (LAPP).

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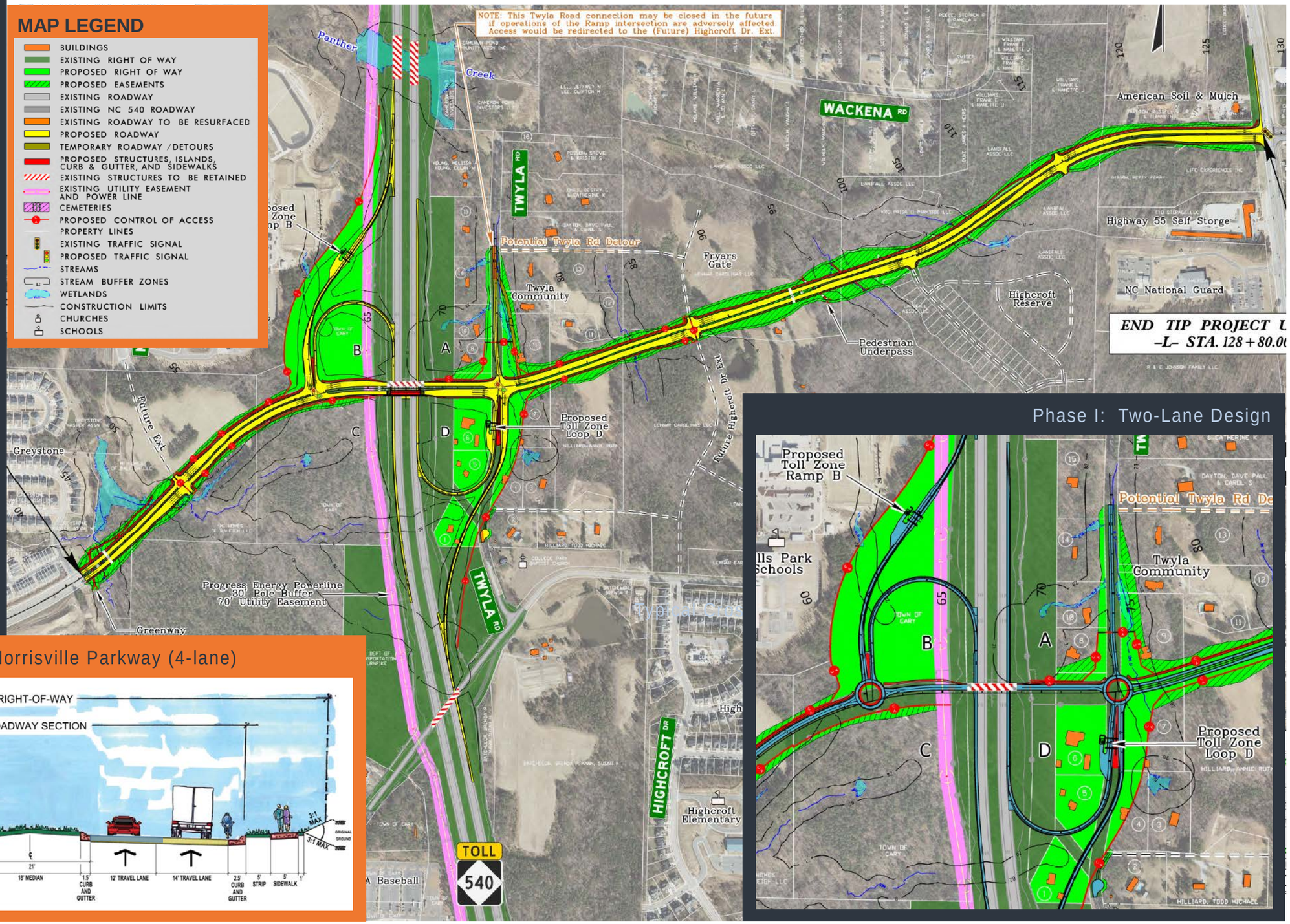
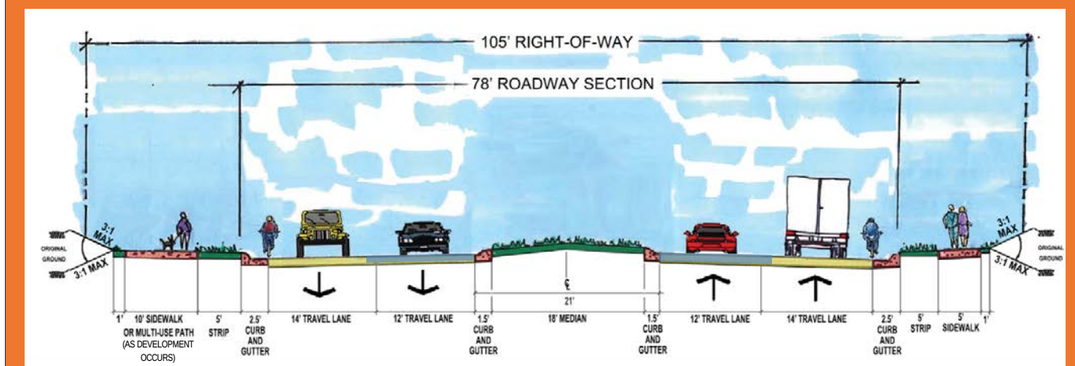


Phase I: Two-Lane Design

Typical/Ultimate Cross-section for Morrisville Parkway (4-lane)



Appendix F

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