



December 15, 2022

US 1 (Capital Boulevard) Freeway Upgrade

Informational Meeting for Concurrence Point 3/4A

STIP Project U-5307, Wake County, NC





US 1 (Capital Boulevard) Freeway Upgrade

Informational Meeting for CP 3/4A

STIP Project No. U-5307, Wake County, NC

Informational Packet – Subject to Change

12/01/2022

Prepared by RS&H, Inc. at the direction of NCDOT

Table of Contents

1	Introduction & Project Overview.....	1
1.1	Introduction.....	1
1.2	Project Description.....	2
1.3	Project Status	3
2	Merger Process History	5
2.1	Concurrence Point 1 Purpose & Need and Project Study Area (June 2018)	5
2.2	Concurrence Point 2 Detailed Study Alternatives Carried Forward (November 2018).....	6
2.3	Concurrence Point 2 Revised (April 2021).....	7
2.4	Concurrence Point 2A Bridging Decisions & Alignment Review (July – November 2021)...	9
3	Public Outreach & Ongoing Coordination Efforts	10
3.1	Public Involvement Prior to CP 2A.....	10
3.2	Public Involvement Since CP 2A.....	10
3.2.1	Public Meeting No. 2 (December 9, 2021).....	10
3.3	Ongoing Efforts.....	11
3.3.1	Citizen and Developer Coordination	11
3.3.2	Municipal Comments and Questions	11
3.3.3	Public Meeting Map Updates	11
3.3.4	Section 6(f) Coordination.....	12
3.3.5	NC Historic Preservation Office (HPO) Coordination.....	12
3.3.6	Circle Drive Neighborhood Meeting	14
4	Current Project Designs and Updates Following CP 2A.....	15
4.1	Traffic Operations.....	15
4.2	US 1 Mainline Number of Lanes.....	16
4.3	Service Road Alignments	22
4.4	Other Design Components	24

List of Tables

Table 1-1. U-5307 Project Schedule (NCDOT 2020-2029 Current STIP, November 2022*).....	4
Table 1-2. U-5307 Project Cost Estimates (NCDOT 2020-2029 Current STIP, November 2022).....	4
Table 2-1. Bridging & Alignment Decisions from CP 2A	9
Table 4-1. Project Life Expectancy Based on 2040 Build Volumes, LOS Threshold of Basic Freeway Segments, and Geometric Design Requirements.....	17

List of Figures

Figure 1-1. U-5307 Project Limits.....	2
Figure 1-2. Proposed Improvements	3
Figure 2-1. Project Study Area Agreed Upon at CP 1	5
Figure 3-1. Historic Property Locations.....	12
Figure 4-1. Segment D – US 1 Mainline Proposed Lanes Graphic.....	18
Figure 4-2. Segment C – US 1 Mainline Proposed Lanes Graphic.....	19
Figure 4-3. Segment B – US 1 Mainline Proposed Lanes Graphic.....	20
Figure 4-4. Segment A – US 1 Mainline Proposed Lanes Graphic.....	21

1 Introduction & Project Overview

1.1 Introduction

The purpose of this packet is to provide a project update and additional information in preparation of Concurrence Point 3 (CP 3) and Concurrence Point 4A (CP 4A) meetings (anticipated early 2023).

NCDOT is not seeking concurrence from the Merger Project Team on any of the information shown in this packet. The intent of the information presented here is to provide a detailed project overview as well as summarize previous concurrence points and design progress.

This informational packet includes summaries of the Purpose and Need/Study Area (CP 1), Detailed Study Alternatives Carried Forward (CP 2 and CP 2 Revised), and Bridging Decisions and Alignment Review (CP 2A) previously concurred upon by the NEPA/404 Merger Team. This packet will be expanded upon for the CP 3 (Least Damaging and Practicable Alternative) and CP 4A (Avoidance and Minimization) meetings.

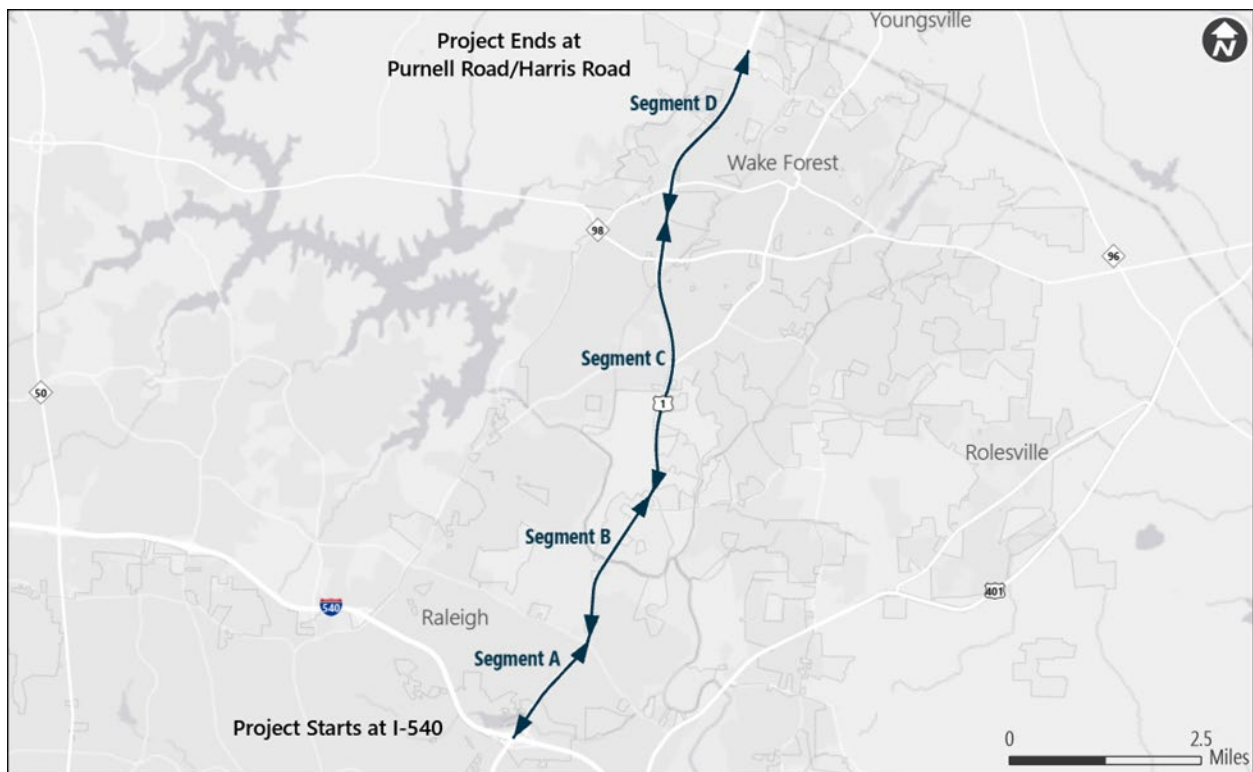
1.2 Project Description

The North Carolina Department of Transportation (NCDOT) proposes to upgrade approximately 10.5 miles of US 1 (Capital Boulevard) from I-540 in Raleigh to SR 1909 (Purnell Road)/SR 1931 (Harris Road) in Wake Forest in Wake County. This project is included as four segments, A through D, in NCDOT's current State Transportation Improvement Program (STIP) as Project U 5307 (see **Figure 1-1**).

U-5307 Segment Summary

- » Segment A – I-540 to north of Durant Road/Perry Creek Road
- » Segment B – North of Durant Road/Perry Creek to Burlington Mills Road
- » Segment C – North of Burlington Mills Road to south of NC 98 Business
- » Segment D – South of NC 98 Business to Purnell Road/Harris Road

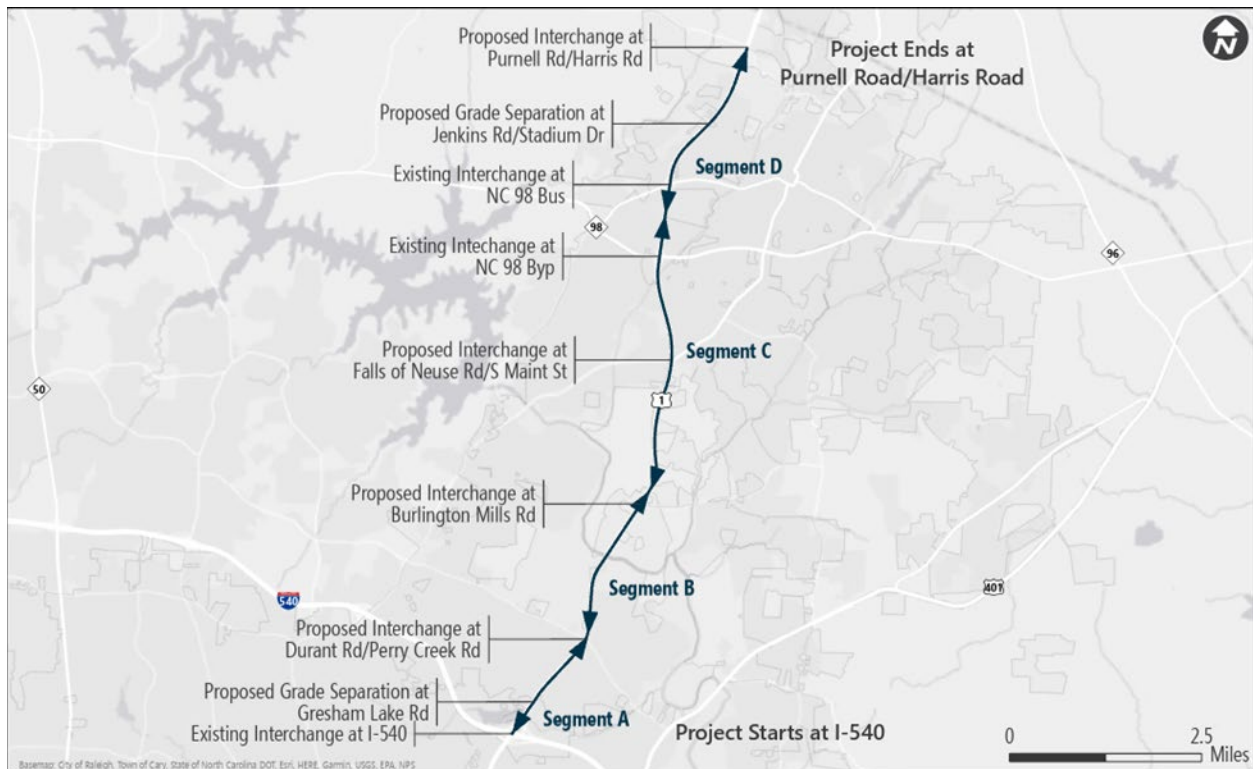
Figure 1-1. U-5307 Project Limits



Proposed improvements include upgrading US 1 from a median-divided roadway with partial access control to a fully controlled-access freeway as well as improving existing and constructing new interchanges and service roads. The current design includes the following:

- » Removing all traffic signals and driveway connections along US 1
- » Improving existing interchanges along US 1 at I-540, NC 98 Bypass, and NC 98 Business
- » Constructing two new grade separations along US 1: north of I-540 at Gresham Lake Road and at the existing Jenkins Road/Stadium Drive intersection
- » Constructing new interchanges at Durant Road/Perry Creek Road, Burlington Mills Road, US 1A (Falls of Neuse Road/S Main Street), and Purnell Road/Harris Road
- » Improving existing service roads and constructing new service road connections throughout the project corridor

Figure 1-2. Proposed Improvements



1.3 Project Status

After completion of CP 2A in June 2021, preliminary designs were further developed, and Public Meeting 2 was held in December 2021. Following the Public Meeting, the Project Team addressed over 200 comments received at the Public Meeting and during the Public Comment Period (December 9, 20201 – January 7, 2022). Open channels of communication have been maintained with the public and the Project Team has continued to address additional comments and questions.

Comments were also received from the City of Raleigh, Town of Wake Forest, US 1 Council of Planning, and GoTriangle regarding the preliminary design presented at the Public Meeting. Additional coordination has been ongoing to address questions and concerns from municipalities. The overall project schedule as shown in the NCDOT 2020-2029 Current STIP (November 2022) can be seen in **Table 1-1**.

Table 1-1. U-5307 Project Schedule (NCDOT 2020-2029 Current STIP, November 2022*)

Segment	ROW	Utilities	Construction
Segment A	FY 2025	FY 2025	FY 2025-2028
Segment B	FY 2025	FY 2025	FY 2027-2029**
Segment C	FY 2025	FY 2025	FY 2027-2029**
Segment D	FY 2029*	FY 2029*	**

* Draft STIP displays ROW, Utility, and Construction potentially shifting 1-2 fiscal years later.

** Construction either partially funded or unfunded in the current STIP.

Based on ongoing coordination, a more detailed schedule extending through completion of the environmental document was developed. This schedule anticipates completion of the Merger Process by March 2023 and finalizing the Environmental Document in May 2023¹.

Project cost estimates as shown in the NCDOT 2020-2029 Current STIP (November 2022) can be seen in **Table 1-2**.

Table 1-2. U-5307 Project Cost Estimates (NCDOT 2020-2029 Current STIP, November 2022)

Segment	Right-of-Way	Utilities	Construction	Total
Segment A	\$37,600,000	\$4,500,000	\$82,600,000	\$124,700,000
Segment B	\$25,000,000	\$2,700,000	\$92,400,000	\$120,100,000
Segment C	\$30,000,000	\$3,000,000	\$95,100,000	\$128,100,000
Segment D	\$40,100,000	\$3,700,000	\$56,400,000	\$100,200,000
TOTAL	\$132,700,000	\$13,900,000	\$326,500,000	\$474,100,000*

* Total project cost includes an additional \$1,000,000 of prior years cost (Preliminary Engineering, Planning, etc.)

¹ Project schedule is subject to change. Current plans include completing a Federal Categorical Exclusion (CE). FHWA may determine that type of environmental document required should be an Environmental Assessment (EA) which would likely impact the current project schedule.

2 Merger Process History

2.1 Concurrence Point 1

Purpose & Need and Project Study Area (June 2018)

The purpose of the meeting was to discuss the project's Purpose & Need and the Study Area. Existing conditions were presented alongside the proposed study area, project's need, and project's purpose. Upon conclusion of the presentation and discussions, the 404 Merger Team reached consensus and signed the formal CP 1 agreement on June 14, 2018, which defines the following:

Need of the Proposed Action

- » Traffic congestion and trip time unreliability

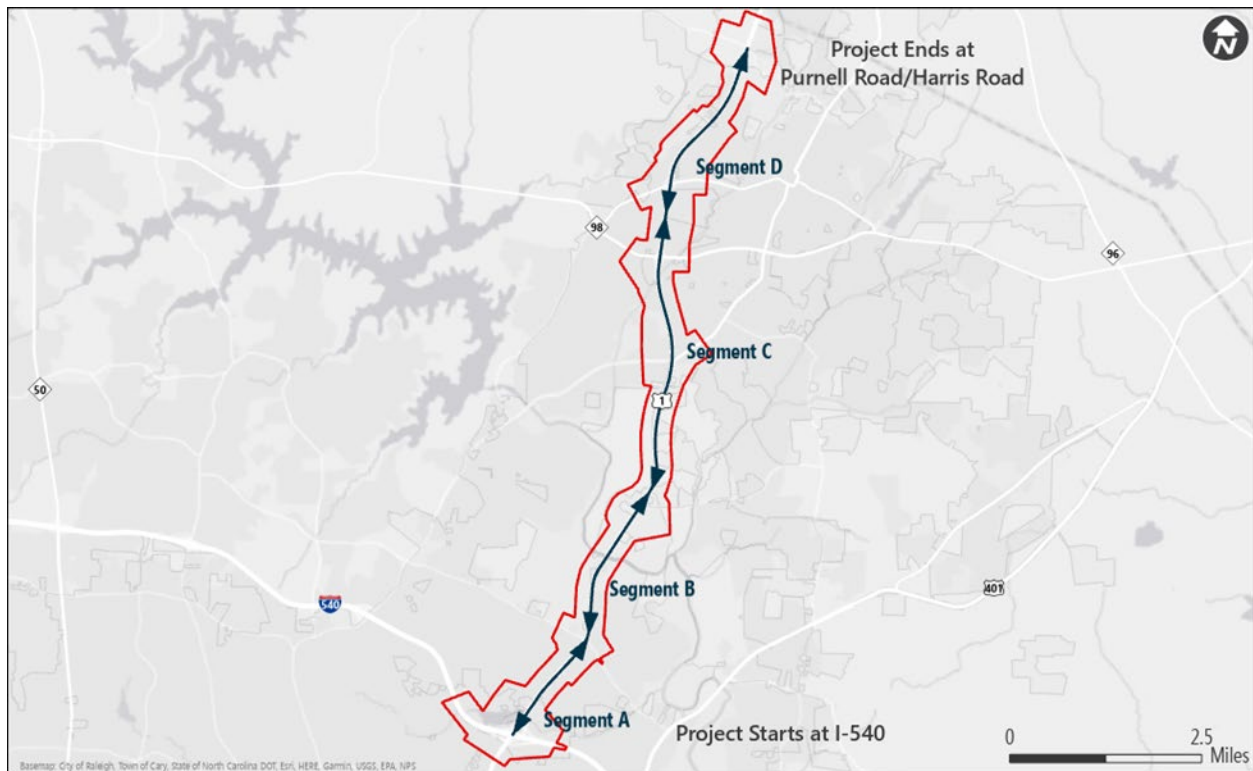
Purpose of the Proposed Action

- » Improve traffic congestion and travel times
- » Maintain regional mobility and local connectivity

Study Area Defined

- » The study area agreed upon at the CP 1 meeting extends along US 1 from I-540 to Purnell Road/Harris Road in Wake County, as shown in **Figure 2-1** below.

Figure 2-1. Project Study Area Agreed Upon at CP 1



2.2 Concurrence Point 2

Detailed Study Alternatives Carried Forward (November 2018)

The purpose of the meeting was to discuss the Detailed Study Alternatives Carried Forward. Public comments from the October 2018 Public Meetings, proposed design alternatives, plus stream and wetland impacts were presented. Upon conclusion of the presentation and discussions, the Merger Team reached consensus and signed the formal CP 2 agreement on November 14, 2018, which defines the following alternatives to carry forward:

Segments A-D

- » US 1 Mainline
 - Conversion to a controlled-access highway; best fit alignment for centerline with consideration for maintenance of traffic during construction
- » Service Roads
 - A combination of existing streets and new location service roads are under study to maintain regional mobility and local connectivity

Segment A

- » I-540 (existing interchange)
 - New flyover carrying US 1 southbound to directly connect with I-540 eastbound
 - Westbound lane addition between Triangle Town Boulevard Interchange and US 1 southbound on-ramp at I-540
- » Durant Road/Perry Creek Road (proposed interchange)
 - Option A – Diverging Diamond Interchange (US 1 over Durant Road/Perry Creek Road)
 - Option B – Diamond Interchange (US 1 over Durant Road/Perry Creek Road)

Segment B

- » Burlington Mills Road (proposed interchange)
 - Option A – Diamond Interchange (US 1 under Burlington Mills Road)
 - Option B – Diverging Diamond Interchange (US 1 under Burlington Mills Road)

Segment C

- » US 1A (Falls of Neuse Road/S Main Street) (proposed interchange)
 - Diverging Diamond Interchange (US 1 over US 1A)
- » NC 98 Bypass (existing interchange)
 - Ramp modifications at the gores but keeping the existing lane configurations for the Single Point Urban Interchange (SPUI) the same

Segment D

- » NC 98 Business (existing interchange)
 - Addition of a loop in the northeast quadrant and relocation of adjacent on-ramp
- » Jenkins Road/Stadium Drive (existing intersection)
 - New grade separation (US 1 under Jenkins Road/Stadium Drive)
- » Purnell Road/Harris Road (proposed interchange)
 - Partial cloverleaf (US 1 under Purnell Road/Harris Road)

2.3 Concurrence Point 2 Revised (April 2021)

In February 2020, the project team and key agency team members determined that an update would be necessary to the CP 2 agreement. Additional coordination via emails and meetings was completed in April 2021.

CP 2 revisions included five minor study area modifications to “[...] account for pavement tie-ins and potential easements” as well as revising the previously agreed upon interchange types to carry forward at US 1 at Durant Road/Perry Creek Road and US 1 at Burlington Mills Road. Upon conclusion of agency correspondence, the Merger Team reached a formal consensus and signed the revised CP 2 Agreement on April 7, 2021, detailing the following:

Segments A-D

- » US 1 Mainline
 - Conversion to a controlled-access highway; best fit alignment for centerline with consideration for maintenance of traffic during construction
 - No change from CP 2
- » Service Roads
 - A combination of existing streets and new location service roads are under study to maintain regional mobility and local connectivity
 - No change from CP 2

Segment A

- » I-540 (existing interchange)
 - Flyover carrying US 1 southbound to directly connect with I-540 eastbound
 - No change from CP 2
 - Westbound lane addition between Triangle Town Boulevard Interchange and US 1 southbound on-ramp at I-540
 - No change from CP 2
- » Durant Road/Perry Creek Road (proposed interchange)
 - Option A – Diverging Diamond Interchange (US 1 over Durant Road/Perry Creek Road)
 - Option changed to Minimized DDI for CP 2 Rev
 - Option B – Diamond Interchange (US 1 over Durant Road/Perry Creek Road)
 - Option removed from consideration for CP 2 Rev

Segment B

- » Burlington Mills Road (proposed interchange)
 - Option A – Diamond Interchange (US 1 under Burlington Mills Road)
 - No change from CP 2
 - Option B – Diverging Diamond Interchange (US 1 under Burlington Mills Road)
 - Option removed from consideration for CP 2 Revised
 - Option C – Skewed Partial Cloverleaf Interchange
 - Added for CP 2 Revised

Segment C

- » US 1A (Falls of Neuse Road/S Main Street) (proposed interchange)
 - Diverging Diamond Interchange (US 1 over US 1A)
 - No change from CP 2
- » NC 98 Bypass (existing interchange)
 - Ramp modifications at the gores but keeping the existing lane configurations for the Single Point Urban Interchange (SPUI) the same
 - No change from CP 2 but studying potential ramp improvements

Segment D

- » NC 98 Business (existing interchange)
 - Addition of a loop in the northeast quadrant and relocation of adjacent on-ramp
 - No change from CP 2 but studying potential ramp and loop additions (see **Section 4.4** for additional information)
- » Jenkins Road/Stadium Drive (existing intersection)
 - New grade separation (US 1 under Jenkins Road/Stadium Drive)
 - No change from CP 2 but working with stakeholders not to preclude possible future improvements by others
- » Purnell Road/Harris Road (proposed interchange)
 - Partial cloverleaf (US 1 under Purnell Road/Harris Road)
 - No change from CP 2

2.4 Concurrence Point 2A

Bridging Decisions & Alignment Review (July – November 2021)

Bridging Decisions and Alignment Review for major hydraulic structures were presented in the CP 2A packet and reviewed in the field on July 7, 2021. Following additional emails and correspondence, comments, and review time, the CP 2A packet was signed on November 17, 2021.

Table 2-1 includes the concurred upon structures from the CP 2A meeting.

Table 2-1. Bridging & Alignment Decisions from CP 2A

Site #	Stream or Feature Crossing Roadway	Existing	Proposed Structure	Wetland Impacts (acres)	Stream Impacts (lf)
Segment A					
1	UT to Perry Creek I-540	72" RCP	Retain existing	0.1	70
2	UT to Perry Creek I-540	Double-barrel 8'x6' RCBC	Retain existing & add 72" supplemental pipe	0.0	180
3	Perry Creek Gresham Lake Road Ext	N/A	300' bridge	0.0	260
4	Perry Creek US 1	Triple-barrel 8'x8' RCBC	Retain + extend existing & add 84" supplemental pipe	0.0	190
5	UT near Neuse River US 1	Double-barrel 8'x8' RCBC	Retain existing & add 84" supplemental pipe	0.0	100
6	UT near Neuse River Y10 (new service road)	N/A	48'W x 60'L bridge	0.0	120
7	UT near Neuse River Y10 (new service road)	N/A	Single 6'x7' RCBC with notched sill	0.1	300
11	UT near Neuse River Driveway	N/A	DELETED (no longer necessary)	N/A	N/A
Segment B					
8	Neuse River US 1	Dual 250' bridges	345' dual bridges + service road bridge ²	0.0	430
Segment C					
9	UT to Smith Creek Y18 (new Star Rd Ext)	N/A	Single 7'x8' RCBC	0.6	810
10	Richland Creek US 1	Quadruple 10'x11' RCBC	Retain + extend existing RCBC & add 72" supplemental pipe	0	160
12	US 1 over CSX Rail (NR eligible)	Dual bridges carrying US 1	300' dual bridges + service road bridge	0.0	0.0

Potential wetland and stream impacts calculated for CP 2A were determined using slope stakes + 40'.

² Three 280' bridges (US 1 structures + service road) were recommended as part of the CP 2 Packet. Following additional coordination and recommendations from USFWS and NCWRC, 345' bridges were concurred upon to allow for wildlife crossings along the southern bank of the Neuse River.

3 Public Outreach & Ongoing Coordination Efforts

3.1 Public Involvement Prior to CP 2A

Two Public Meetings were held in October 2018 to present preliminary designs and gather public feedback. A total of 477 citizens attended the meetings. 52 comments were received via comment forms at the Public Meetings with an additional 10 comments submitted via email and 100 through the project website.

Other conference calls were held with various small groups including the South Forest Business Park, Southeastern Baptist Theological Seminary, Duke Energy, Wake Forest Crossing Shopping Center, Celebration Church, and representatives for several property owners along the corridor. Extensive public involvement for the US 1 Corridor Study was conducted prior to STIP Project U-5307 and is summarized on CAMPO's website.

3.2 Public Involvement Since CP 2A

Following CP 2A, the U-5307 project design was further developed, and Public Meeting materials were prepared using previously agreed upon details. Various alternatives at interchange locations were presented based on the outcome of the CP 2 Revisions, bridges and culverts were presented based on coordination during CP 2A, and specific betterment options were presented based on NCDOT and municipal coordination.

3.2.1 Public Meeting No. 2 (December 9, 2021)

Preliminary designs were approved and presented at Public Meeting 2 in December 2021. A virtual public meeting (webinar) was held on December 9, 2021, at 6:00 PM via GoTo Meeting. A public comment period was open from December 9, 2021, through January 7, 2022.

Meeting materials included Public Meeting Maps, handouts, project video, presentation, and an updated project website, <https://publicinput.com/T041>. A recording of Public Meeting 2 is available [here](#).

Approximately 300 citizens participated (answered survey questions or asked questions) from the 3,000 plus website hits during this public outreach period. More than 200 new subscribers were added to the project email list.

Comments were fielded from citizens, developers, and municipalities and addressed in several rounds of communication as detailed below:

- » Public Comments Received at the Public Meeting on December 9, 2021 (see [response document](#)) and Public Comments Received During the Public Comment Period (see [response document](#))
 - Comments were reviewed and categorized by location and/or topic (i.e., Schedule, Funding, Gresham Lake Road, Safety, etc.) and addressed in two (2) individual documents that were distributed to the project subscriber list.
- » Property Specific Comments and Questions

- All other citizen comments and questions from the public meeting and public comment period were addressed individually via email and/or phone by April 19, 2022.
- » Municipal Comments
 - The City of Raleigh, Town of Wake Forest, US 1 Council of Planning, and GoTriangle submitted formal comments/resolutions relating to the preliminary designs. The Project Team continued internal discussions and engaged the municipalities and departments in the months following the Public Meeting. Additional details are provided in the Ongoing Efforts section below.

3.3 Ongoing Efforts

3.3.1 Citizen and Developer Coordination

Since the conclusion of the public comment period in January 2022, NCDOT has maintained an open line of communication with the public and has continued to respond to comments and project inquiries via telephone and email.

The Project Team has also fielded multiple developer requests to meet and discuss preliminary designs. Developers have initiated coordination with the Project Team to discuss their proposed developments in relation to the U-5307 plans. The Project Team has shared preliminary designs and provided information on how development plans may impact the project design and vice versa. Private development coordination has ranged from existing major facilities such as Mallinckrodt and Guerbet to a variety of multi-use, residential, and commercial developments.

3.3.2 Municipal Comments and Questions

To address significant impact concerns expressed by the participating municipalities, NCDOT held meetings on September 1st and 13th, 2022 with the Town of Wake Forest and City of Raleigh, respectively (CAMPO staff attended both municipal meetings.). The official resolutions were reviewed and discussed with the Town of Wake Forest, City of Raleigh, and CAMPO staff. These stakeholders were engaged in discussions centered around, but not limited to, typical sections, number of lanes along US 1 and service roads, bicycle and pedestrian facilities, service road connections, interchange locations and designs, US 1 access, and traffic projections.

NCDOT and the municipalities are in the process of concluding discussions that will establish which design components will be included as part of the project versus as a betterment. The outcome of these meetings will be reflected in the NCDOT recommended alternatives at CP 3. Changes from what was originally agreed upon in previous Merger Meetings will be clearly documented as part of the CP 3 materials.

3.3.3 Public Meeting Map Updates

The *Traffic Noise Report* was finalized on March 16, 2022, which identified seven potential noise abatement areas (PNAA). The November 2021 Public Meeting Maps were updated with the PNAAs

in August 2022 followed by a public notice informing residents (on the subscriber list) that this information was available. These maps are available on the project website [here](#).

3.3.4 Section 6(f) Coordination

The Project Team coordinated with NC Parks and the Town of Wake Forest to determine restrictions associated with Joyner Park (701 Harris Road, Wake Forest). The park was awarded two Land and Water Conservation Fund grants for property acquisition and Phase I development which result in specific deed restrictions related to property impacts. To avoid potential Section 6(f) impacts, the project design was revised to stop the multi-use path along the south side of Harris Road at the Joyner Park property line. Additional coordination and design revisions may continue through final design if new information is made available.

3.3.5 NC Historic Preservation Office (HPO) Coordination

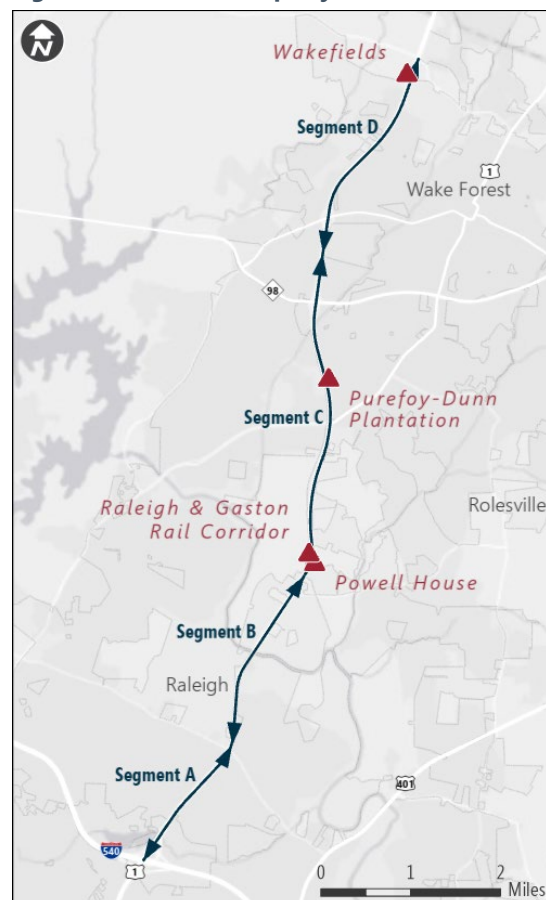
Four properties protected by Section 4(f) of the US Department of Transportation Act are located within the area of potential effect, or APE. Three of these properties are on the National Register and one is listed as eligible for the National Register. **Figure 3-1** shows the location of each property in relation to the project corridor and U-5307 segment.

The Historic Property Effects Meeting was held with HPO on October 27, 2022. Details regarding each property and outcome from the Effects Meeting are included below:

Powell House (National Register, Site WA0040)

- » 10200 Capital Boulevard, Wake Forest
- » No right-of-way required but change in access will be necessary. An on-site meeting was held with the property owners on May 18, 2022. Since the U-5307 project eliminates the front drive to US 1, a new driveway location was recommended by NCDOT to the property owners, extending from Stroller Ridge Drive and connecting with their current driveway.
- » SHPO Effects Meeting Outcome
 - **No Adverse Effect (with commitments).** Commitments include that NCDOT will provide a driveway to access to this property off existing Stroller Ridge Drive. NCDOT will protect the triangular piece of land between Capital Boulevard and the development parcel, which is located in between right of way and the historic property boundary.
 - **4(f) de minimus impact**

Figure 3-1. Historic Property Locations



Raleigh & Gaston Rail Corridor (Eligible for the National Register)

- » The rail corridor crosses US 1 approximately ½ mile north of Burlington Mills Road. Ongoing coordination with CSX and NCDOT Rail Division has been maintained throughout the planning and design process. Current designs factor in vertical and horizontal clearances and allow for the addition of another rail line.
- » SHPO Effects Meeting Outcome
 - **No Effect**
 - **4(f) – no impact**

Purefoy Dunn Plantation (National Register, Site WA0221)

- » 11300 Capital Boulevard, Wake Forest
- » No right-of-way or easements are required, and no access changes are proposed. The property does not experience a substantial increase in noise from no-build to build condition but does meet the absolute noise level impact threshold for the build condition. A noise wall is not feasible since there is only one impacted receptor at this location.
- » SHPO Effects Meeting Outcome
 - **No Effect**
 - **4(f) – no impact**

Wakefields/Sutherland (National Register, Site WA0047)

- » 13371 Wake Union Church Road, Wake Forest
- » Acquisition of a permanent easement approximately 20 feet in width is anticipated along the front boundary of the historic property.
- » SHPO Effects Meeting Outcome
 - **No Adverse Effect (with commitments)**. Commitments include that the retaining wall along Capital Boulevard will be a soil nail wall with a wall design selected by the property owner. Landscaping and fence style behind the wall will be coordinated with the property owner. The cul-de-sac will be eliminated from the parcel behind the property, as seen on the plans.
 - **4(f) de minimus**

3.3.6 Circle Drive Neighborhood Meeting

A small group, neighborhood meeting was held on November 16, 2022, from 6:00 to 8:00 PM at Celebration Church (8700 Capital Boulevard) to address the residents along Circle Drive. The purpose of this meeting was to provide information on the U-5307 project, particularly with regards to Segment B and the two proposed interchange options at Burlington Mills Road.

Both interchange options are likely to have impacts to the residents along Circle Drive, with Option 1 (diamond) resulting in requiring a new entrance to the neighborhood and Option 2 (skewed partial cloverleaf) resulting in the displacement of all residents in this neighborhood. The project team presented the Public Meeting Maps from December 2021 and provided an overview of these scenarios, answered questions, and listened to comments and concerns of the residents. Residents were encouraged to share their thoughts in writing as well and provided comment forms for additional feedback.

Based on the feedback received at this meeting, the residents of Circle Drive overwhelmingly prefer Option 1 (diamond interchange) to Option 2 (partial cloverleaf interchange). Residents noted that many of them have lived along Circle Drive for a number of years, some their entire lives, with multiple generations of several families still present. Residents also noted hardships associated with relocating due to disabled children and elderly populations. The overall feelings shared were that this is a tight-knit cohesive community with substantial sentimental and (personal) historic value and not something that can be replaced.

4 Current Project Designs and Updates Following CP 2A

This section provides a complete overview of the traffic operations and proposed number of lanes on US 1, proposed service roads, updated interchange options, and other design components to provide the Merger Team with an update on the project's progression.

4.1 Traffic Operations

A traffic memo was drafted on September 20, 2022 (*US 1 Typical Section Analysis Memo*) as supplemental information and was distributed to the USACE and CAMPO for their review. The intent of the memo was to provide a historical overview of the traffic and design processes that resulted in the preliminary design shown on the December 2021 Public Meeting Maps.

No additional analyses were conducted, or decisions made, as a result of the information presented in the memo noted above. The following section includes clarifying information for several key items noted by the USACE. An updated typical section memo will also be provided that supersedes any previous versions.

Design Year

- » A 2040 design year was used as part of CP 1 and all subsequent analyses were based on the forecast and operations developed for 2040. Due to the amount of time that has elapsed since the conception of the project (project delays associated with funding, COVID-19, etc.), preliminary projections were developed to gain a rough understanding of the project's life. 2040 remains the design year and all analyses/decisions were based on 2040 volumes. Additional information is available in **Section 4.2** and the data can be reviewed in **Table 4-1**.
- » As part of the municipal coordination efforts, NCDOT has agreed to review the 2050 Triangle Regional Model (TRM) when it becomes available in 2023. No wholesale updates to the current design are expected as a result of this review, but NCDOT does anticipate being able to enhance minimization efforts during CP 4A and final design.

Measures of Effectiveness (MOEs)

- » MOEs were determined as part of CP 1 to ensure the project maintains consistency with the Purpose and Need, as stated in **Section 2.1**.
 - *Planning Time Index* – Studied in conjunction with the development of the CP 1 Packet and trip times were noted as taking up to four times longer than expected.
 - *Level of Service (LOS)* and *Travel Times* – Noted in the signed CP 1 packet and CP 1 meeting summary that these MOEs should be used for CP 2. Specific LOS requirements were not included as part of the Purpose and Need since LOS is serving as a validation tool, rather than a selection tool, for the design alternatives.

Corridor Travel Times along the US 1 mainline and I-540 were used to support the proposed design alternatives (which performed comparably). Based on the build alternatives, travel times are expected to improve by up to 50 percent (future no-build versus future build). Results of these analyses are included in the *Traffic Operations Reports, Volume 1* (November 2018) and *Volume 2* (December 2020).

Note - All options presented as part of this packet have shown to operate at an acceptable LOS and no options have been eliminated from further consideration due to a target LOS requirement.

4.2 US 1 Mainline Number of Lanes

- » Per CP 2 documentation – “The proposed typical section for the US 1 mainline includes three 12-foot travel lanes with 12-foot full-depth paved shoulders and a 3-foot barrier. Auxiliary lanes may be needed on US 1 between I-540 and Burlington Mill Road interchanges” and “Critical lane analysis was used to determine if a design would provide an acceptable Level of Service.”
- » Per CP 2A documentation – “The proposed typical section for the US 1 mainline includes three 12-foot travel lanes with 12-foot full-depth paved shoulders and a 3-foot concrete median barrier. The number of lanes in each direction varies based on traffic needs with most of the US 1 mainline having three lanes in each direction. Auxiliary lanes are proposed on US 1 between I-540 and Burlington Mills Road interchanges, and service/connector roads will be provided.”
- » Following CP 2A, designs were further developed to take additional operational and geometric requirements into consideration resulting in the designs presented in the December 2021 Public Meeting Maps. Additional revisions are possible following municipal coordination efforts. The lanes proposed as part of the current project design are detailed in **Table 4-1** and visualized in **Figure 4.1-4.4**.
 - The lane configurations in **Table 4-1** are divided into three main categories:
 - 1) “Auxiliary Lanes” – Are “[...] defined by AASHTO as the portion of the roadway adjoining the traveled way for speed change, turning, weaving, truck climbing, maneuvering of entering and leaving traffic, and other purposes supplementary to through-traffic movement. [...] They facilitate the positioning of drivers at exits and the merging of drivers at entrances.”³
 - 2) “Thru-Lanes” – These lanes are needed for mainline traffic operations; 6 lanes are the standard along the entire roadway.
 - 3) “Transition Lanes” – These lanes are not required based on traffic operations but are added due to geometric/design constraints that do not allow the dropping of lanes. Such constraints include, but are not limited to, inadequate distance between exit and entrance ramps, lane balance, and basic number of lanes guidance from AASHTO.
 - “Merge Lane”, “Diverge Lanes”, and “Option Lanes” – Lanes that are not included as part of the total lane count but are required as part of traffic operations to maintain acceptable on/off movements. These lanes drop or develop between interchanges so are not considered auxiliary lanes. Merge, diverge, and option lanes are shown in **Figure 4.1-4.4**.

³ FHWA – [*Freeway Management and Operations Handbook*](#)

Table 4-1. Project Life Expectancy Based on 2040 Build Volumes, LOS Threshold of Basic Freeway Segments, and Geometric Design Requirements

Segment	Estimated 2040 Vol.	Existing Thru-Lanes	Minimum # of Lanes for LOS D or Better	# Lanes in Current Design				Project Life Expectancy by LOS & Year			
				Thru-Lanes	Transition Lanes	Auxiliary Lanes	Total # Lanes	6 Thru-Lanes		8 Thru-Lanes	
								LOS E >115,068 vpd	LOS F >129,705 vpd	LOS E >153,431 vpd	LOS F >172,909 vpd
I-540 to Durant Rd / Perry Creek Rd	95,000	6 - 8	6	6	2	2	10	2047	2052	2060	2067
Durant Rd / Perry Creek Rd to Burlington Mills Rd	108,200	4 - 5	6	6	2	0	8	2042	2046	2054	2060
Burlington Mills Rd to US 1A (Main St) / Falls of Neuse Rd	105,400	4	6	6	2	0	8	2043	2047	2055	2061
US 1A (Main St) / Falls of Neuse Rd to NC 98 Bypass	98,900	6	6	6	2	0	8	2045	2050	2058	2065
NC 98 Bypass to NC 98 Business	90,000	4	6	6	0	2	8	2049	2054	2063	2071
NC 98 Business to Harris Rd / Purnell Rd	84,600	4	6	6	0	0	6	2052	2057	2067	2075
Harris Rd / Purnell Rd to Project end	57,200	4	4	4	0	0	4	2073	2082	2096	2107

Estimated 2040 volumes were determined as part of the project's approved traffic forecast. Volumes beyond the 2040 horizon year are extrapolated from the approved 2040 traffic forecast and are not based on new design year data. LOS D and E threshold years are estimated based on these volumes grown at 3% annually and are meant to provide a preliminary understanding of when US 1 is likely to reach gridlock conditions. These values are estimates only and subject to change.

Figure 4-1. Segment D – US 1 Mainline Proposed Lanes Graphic

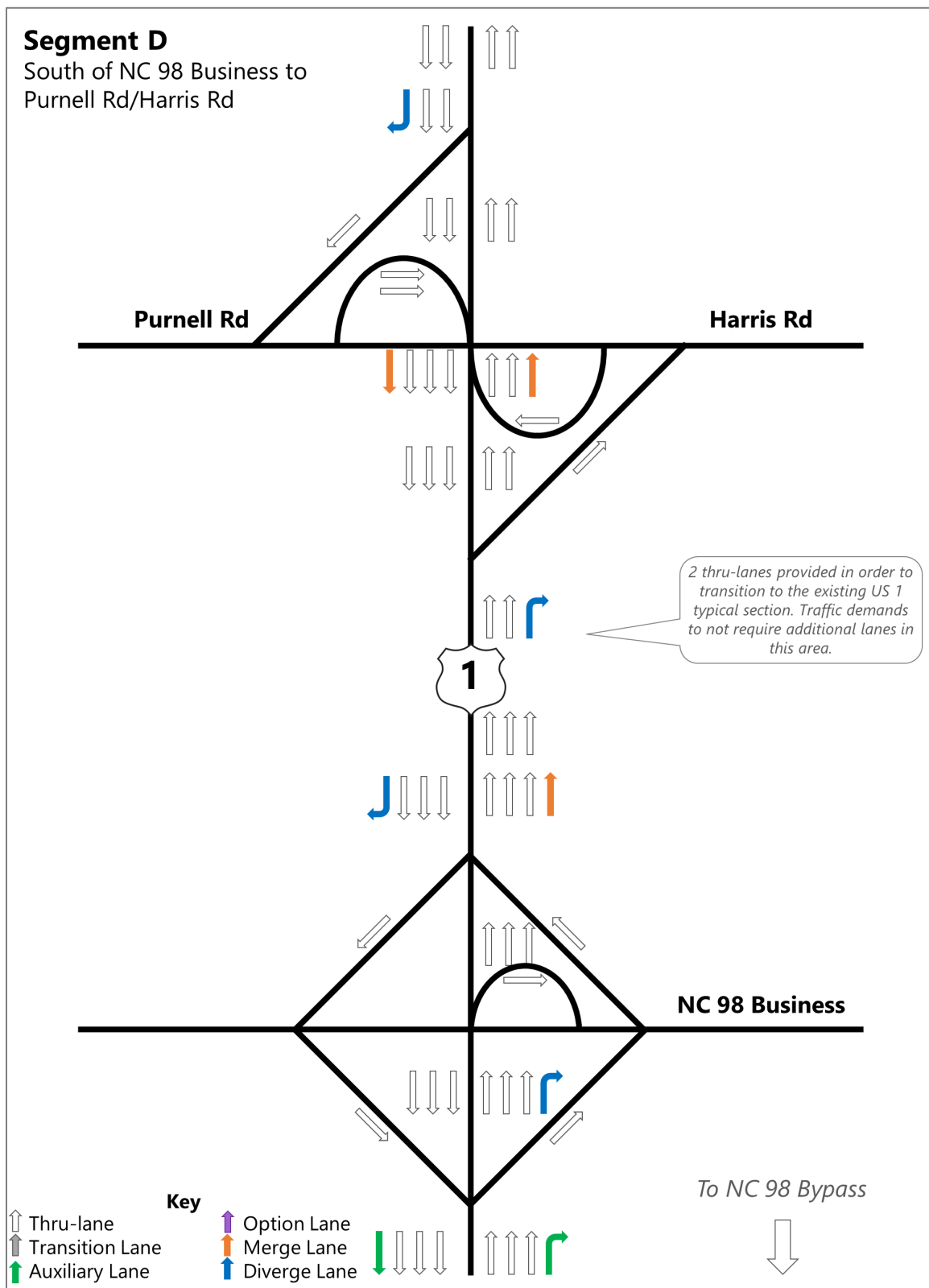


Figure 4-2. Segment C – US 1 Mainline Proposed Lanes Graphic

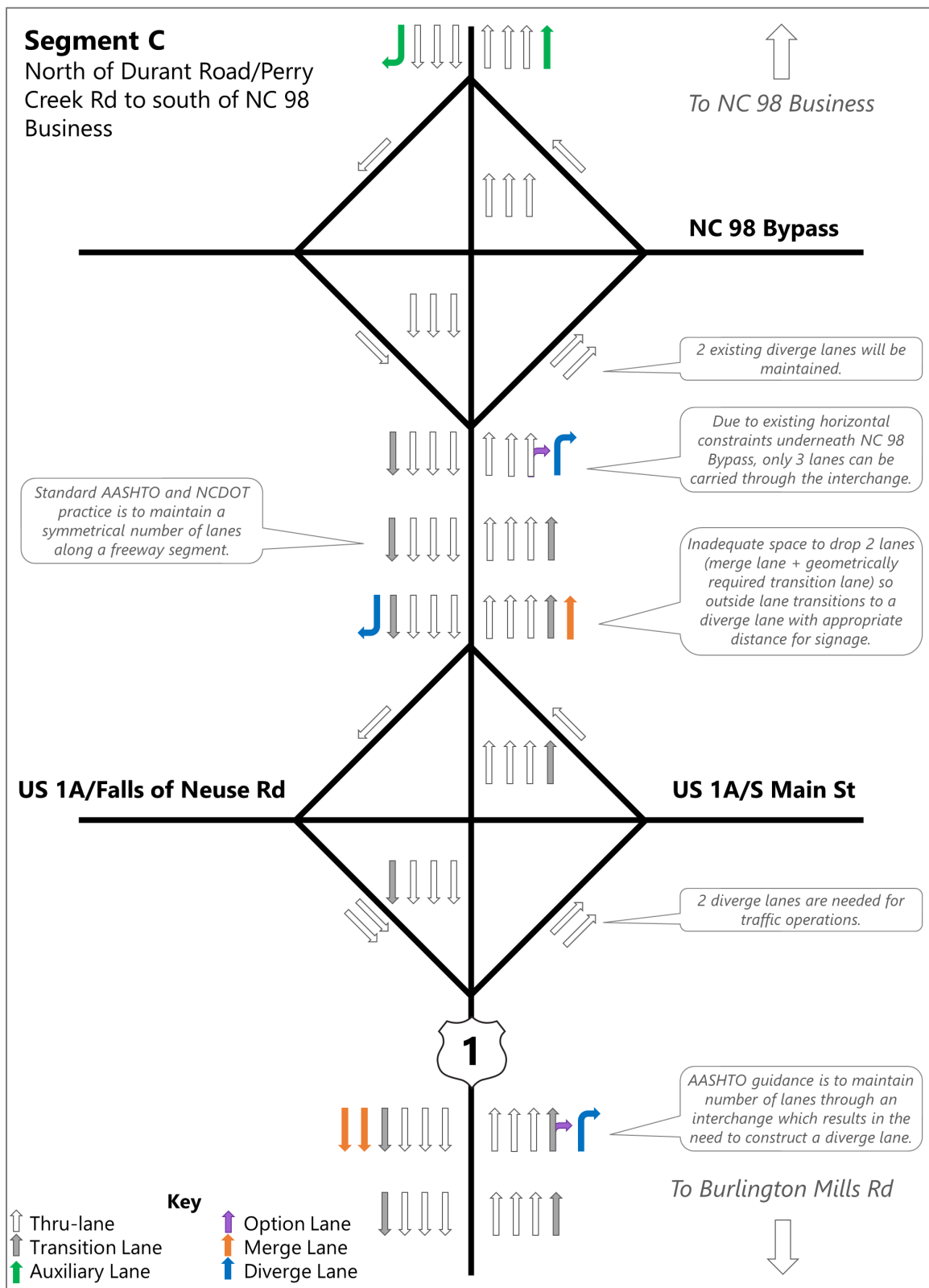


Figure 4-3. Segment B – US 1 Mainline Proposed Lanes Graphic

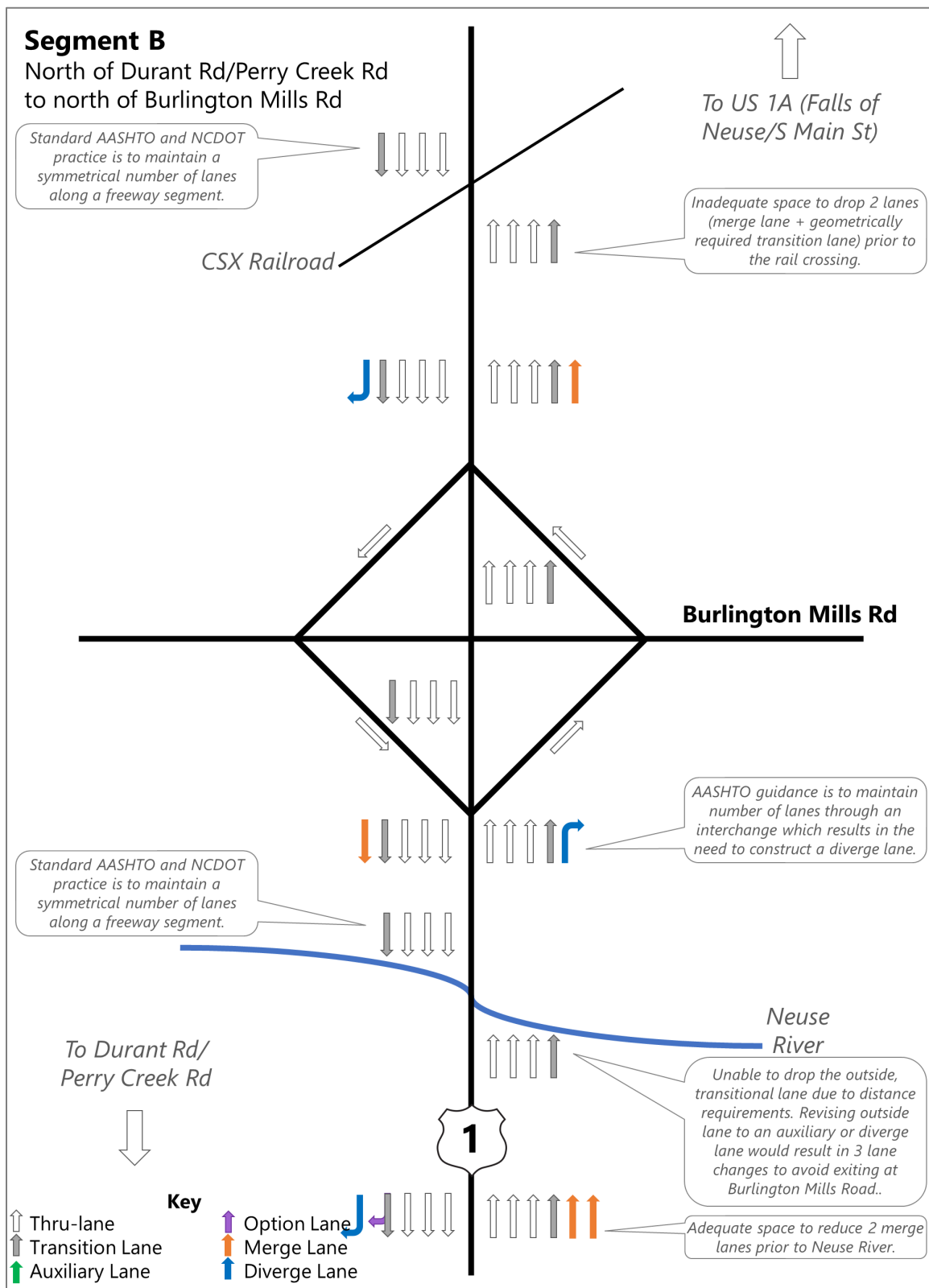
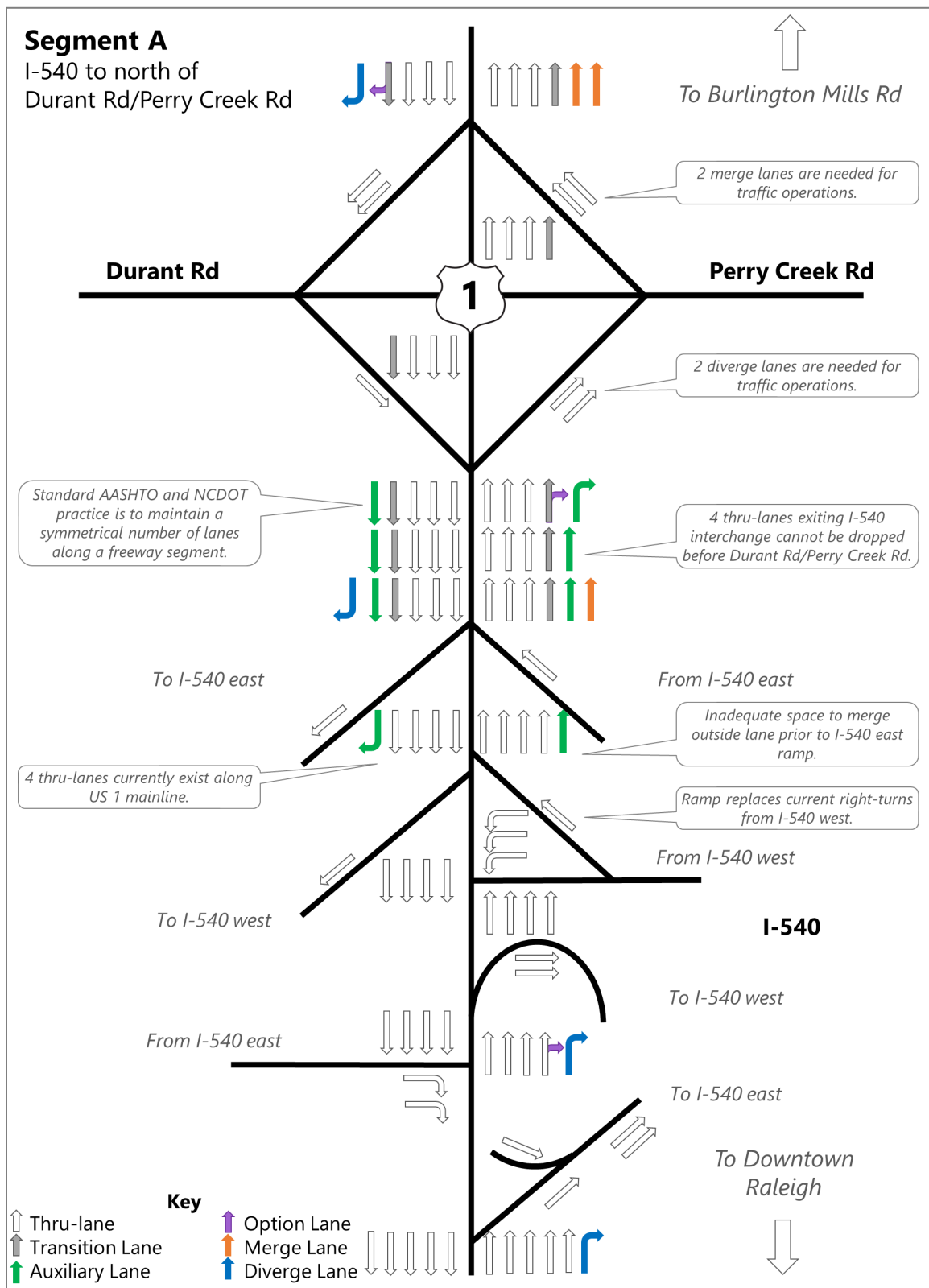


Figure 4-4. Segment A – US 1 Mainline Proposed Lanes Graphic



4.3 Service Road Alignments

Discussions surrounding service roads focused on bridging decisions were discussed in depth during prior CP meetings. The full extent of the proposed service roads was not reviewed by the Merger Team. This section provides a complete overview of the proposed service roads including those relevant to bridging decisions as well as services roads added based on refining project design and addressing public and agency comments.

Previous Concurrence Point Discussions

- » CP 2 – “Service roads and connecting streets are under study to maintain regional mobility and local connectivity and will be presented at Concurrence 2A. The Project Team is considering a combination of existing streets and new location.”
- » CP 2A – 12 bridging decisions were discussed as part of this concurrence point; however, a full review of all service road alignments was not provided.

Service Roads by Segment

- » Segment A
 - *Jacqueline Lane Service Road* – Extension of the existing Jacqueline Lane starting near I-540 extending along the east side of US 1 to Perry Creek Road. This service road may include a tie-in for the Gresham Lake Road overpass (see **Section 4.4**). This service road was discussed with regards to CP 2A bridging decisions at Site #6, Site #7, and Site #11 (removed). See [Public Meeting Map No. 2](#) for the proposed alignment.
 - *Capital Hills Drive (Guerbet/Mallinckrodt Driveway)* – Extension from the existing Capital Hills Drive and Durant Road intersection. This roadway provides access to the Guerbet and Mallinckrodt facilities only since their existing connections along US 1 would be severed as part of access control measures. This roadway does not include any bridging decisions so was not discussed during CP 2A. See [Public Meeting Map No. 3](#) for the proposed alignment.
- » Segment B
 - *Wadford Drive* – Extension of the existing Wadford Drive along the east side of US 1 ultimately connecting Perry Creek Road with River Haven Apartments and the parcels adjacent to the southern bank of the Neuse River. This roadway does not include any bridging decisions so was not discussed during CP 2A. See [Public Meeting Map No. 3](#) for the proposed alignment.
 - *Meadstone Way* – Extension of the existing Meadstone Way along the east side of US 1 connecting parcels along the northern bank of the Neuse River with other development leading up to Burlington Mills Road. This roadway does not include any bridging decisions so was not discussed during CP 2A. See Public Meeting Map No. 4, [Option A](#) or [Option B](#) for the proposed alignment.
 - *Stroller Ridge Drive* – Extension of the existing Stroller Ridge Drive along the east side of US 1 providing a connection with Burlington Mills Road. The decision to make this connection as part of the project was determined during municipal discussions following Public Meeting 2. Stroller Ridge Drive will also provide a private driveway connection to the historic Powell House. This roadway was discussed as a potential betterment during CP 2A but is now

considered to be a part of the U-5307 project. See Public Meeting Map No. 4, [Option A](#) or [Option B](#) for the proposed alignment.

- *Ponderosa Service Road* – Extension of the existing Ponderosa Service Road to the south providing access to parcels north of the Neuse River and along the west side of US 1. This service road would extend north along the west side of US 1 across the rail corridor (end of Segment B) and eventually connect with the existing Ponderosa Service Road. This roadway does not include any bridging decisions so was not discussed during CP 2A. See Public Meeting Map No. 4, [Option A](#) or [Option B](#) and [Public Meeting Map No. 5](#) for the proposed alignment.

» Segment C

- *Ponderosa Service Road* – Continuation of the service road outlined in Segment B which runs along the west side of US 1 before tying into the existing Ponderosa Service Road and Common Oaks Drive to the rear of Wakefield Commons. This roadway does not include any bridging decisions so was not discussed during CP 2A. See [Public Meeting Map No. 5](#) and [Public Meeting Map No. 6](#) for the proposed alignment.
- *Star Road* – Extension and realignment of the existing Star Road along the east side of US 1. This roadway will provide access to parcels from north of the rail corridor to US 1A (S Main Street). This service road was discussed with regards to CP 2A bridging decisions at Site #9. See [Public Meeting Map No. 5](#) and [Public Meeting Map No. 6](#) for the proposed alignment.

» Segment D

- *Y24B (Future Ligon Mill Road Extension)* – standalone segment of Ligon Mill Road will provide a connection along the east side of US 1 connecting NC 98 Business with Agora Drive at Wake Forest Crossing (shopping center). This service road will continue north of Stadium Drive along the east side of US 1 connecting with Devon Square Boulevard at the Devon Square development south of Harris Road. This roadway does not include any bridging decisions so was not discussed during CP 2A. See [Public Meeting Map No. 8](#) for the proposed alignment.
- *Wake Union Church Road* – Extension of the existing roadway providing a connection along the west side of US 1 from NC 98 Business to Jenkins Road to south of Purnell Road. Based on the Effect Meeting with the State Historic Preservation Office, this service road should stop short of the two large parcels to behind Wake Union Baptist Church and the historic Wakefields/Sutherland House properties. This roadway does not include any bridging decisions so was not discussed during CP 2A. See [Public Meeting Map No. 8](#), [Public Meeting Map No. 9](#), and [Public Meeting Map No. 10A](#) for the proposed alignment.

4.4 Other Design Components

Gresham Lake Road Options

- » *Option 1* - Includes access control along US 1 adjacent to Gresham Lake Road and Cheviot Hills Drive. Existing Gresham Lake Road will be a cul-de-sac west of US 1 and traffic will be rerouted to Durant Road via Capital Hills Drive. See [Public Meeting Map No. 2, Option 1](#) for the proposed improvements.
- » *Option 2* – Includes access control along US 1 adjacent to Gresham Lake Road and Cheviot Hills Drive. The existing Gresham Lake Road and Capital Hills Drive would be realigned with a roundabout (per additional municipal and developer coordination) leading up to an overpass over US 1. The new overpass would extend into a T-intersection with the new Jacqueline Lane Service Road extension along the east side of US 1.

NCDOT has conducted additional coordination with the City of Raleigh and CAMPO to reduce the 4-lane typical section to a 2-lane typical section with a reduced median. This update will be reflected during CP 3 and CP 4A discussions. See [Public Meeting Map No. 2, Option 2](#) for the proposed improvements.

- » *Option 3* – Includes the same improvements as Option 1 which includes access control along US 1 adjacent to Gresham Lake Road and Cheviot Hills Drive and a cul-de-sac west of US 1 for existing Gresham Lake Road. Traffic will be rerouted to Durant Road via Capital Hills Drive. Improvements east of US 1 include extending Triangle Town Boulevard north from the existing I-540 at Triangle Town Boulevard interchange. A 300' bridge crossing over Perry Creek was concurred upon as part of CP 2A (Site #3). See [Public Meeting Map No. 2, Option 3](#) for the proposed improvements.
- » *Option 4* – Includes a combination of the improvements detailed in Option 2 and Option 3 and realizes the City of Raleigh's ultimate plan for this area. See [Public Meeting Map No. 2, Option 4](#) for the proposed improvements.

Neuse River Crossings (US 1 Mainline and Service Road)

- » CP 2A – "If the access road on the east side of US 1 is connected across the Neuse River, a third bridge was also recommended at 20 feet. Access road is pending further discussion with the City of Raleigh and Town of Wake Forest, who own properties on the south and north sides of the river, respectively."
- » The Merger Team reviewed this location as part of CP 2A (Bridging Decision Site #8) and concurred upon dual 345' bridges + service road bridge to accommodate wildlife crossings underneath. Per CP 2A documentation, additional agency coordination may be necessary before determining the final bridge length. See [Public Meeting Map No. 3](#) and [Map No. 4](#) for the proposed bridge. An additional [Public Meeting Betterments Map](#) was provided for the service road structure.
- » The Project Team is currently reviewing designs in this location and is engaging in discussions with the City of Raleigh, Town of Wake Forest, and CAMPO before making a final determination on LEDPA recommendations for the US 1 mainline and adjacent service road. **Upon further evaluation, reducing the typical section from 10-lanes to 8-lanes over the Neuse River appears to be a viable option. A final recommendation will be made prior to CP 3.**

Purnell Road/Harris Road Interchange

- » One partial cloverleaf option was concurred upon during CP 2 and noted during CP 2A. As part of the CP 2 Revised documentation, it was noted that "Depending on surrounding terrain and potential

development(s) in the southeast quadrant, NCDOT may need to modify ramp termini on the east side of US 1 to provide additional left-turning storage length(s) along Harris Road.” See [Public Meeting Map, Map 10A, Option 1](#) for the proposed interchange.

- » Following CP 2A, a second partial cloverleaf option was developed to address constructability issues along Wallridge Road (see [Public Meeting Map, Map 10A, Option 2](#)). Due to the proximity of the Purnell Road/Harris Road grade separation over US 1, a complete removal and reconstruction of the retaining wall supporting Wallridge Road would be necessary. Construction phasing would also likely require the interchange to be built prior to the retaining wall work which would remove access to Harris Crossing (shopping center) via US 1, redirecting this traffic through a low-speed residential area and school zone.

Jenkins Road/Stadium Drive Grade Separation

- » CP 2 – “An interchange is not proposed at this location at this time, but the Project Team is working with stakeholders not to preclude possible future improvements by others.”
- » CP 2A – “No change from CP 2.”
- » Following CP 2A, the Project Team conducted additional coordination with the Town of Wake Forest and private developers. No notable changes to the project design in this area have occurred since private developers have been taking options proposed as part of the CAMPO Hot Spot Study and the current designs (for U-5307) into consideration when developing site plans. Inclusion of an interchange at this location is not proposed as part of the U-5307 project. See [Public Meeting Map No. 9](#) for the proposed grade separation.

NC 98 Business Interchange

- » Following CP 2 Revised, NCDOT Structures Unit, Division 5, and PMU engaged in additional discussions regarding the bridge inspection report and determined that the current US 1 bridges over NC 98 should be replaced.

Bus on Shoulder

- » The question of whether transit (bus) use of shoulders would be permitted was discussed as part of CP 2. The preliminary designs developed for Public Meeting No. 2 include adequate space on the outside shoulder (12') if the City of Raleigh, Town of Wake Forest, and/or CAMPO would like to pursue funding. Right-of-way implications are expected to be minimal if bus on shoulders were implemented.

Wake Union Church Road Extension

- » The HPO Effects Meeting was held in October 2022 following CP 2A, Public Meeting No. 2, and additional municipal coordination meetings. Per the Historic Preservation Office, NCDOT will not extend Wake Union Church Road providing a connection to Purnell Road. Any connection, public or private, would result in a potential adverse effect determination on the Wakefields/Sutherland House historic property. See [Public Meeting Map No. 10A](#) for the proposed alignment.