Appendix G: Proposed Refinements Natural Resources Technical Report

Durham-Orange Light Rail Transit Project

GO Triangle

October 2018

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List of Acronyms and Abbreviations

Acronym/Abbreviation	Definition
DEIS	Draft Environmental Impact Statement
D-O LRT	Durham-Orange Light Rail Transit
EA	Environmental Assessment
ESA	Endangered Species Act of 1973
FEIS	Final Environmental Impact Statement
NCCU	North Carolina Central University
NCDA	North Carolina Department of Agriculture
NCDEQ	North Carolina Department of Environmental Quality
NCDWR	North Carolina Division of Water Resources
NCNHP	North Carolina Natural Heritage Program
NCWRC	North Carolina Wildlife Resources Commission
NEPA	National Environmental Policy Act
NHPNA	Natural Heritage Program Natural Area
NRCS	Natural Resources Conservation Service
ROD	Record of Decision
ROMF	Rail Operations and Maintenance Facility
SNHA	significant natural heritage areas
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Survey

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1. Introduction

This technical report presents an analysis of potential impacts of the Durham-Orange Light Rail Transit (D-O LRT) Project Proposed Refinements on natural resources. The previous National Environmental Policy Act (NEPA) documentation for the D-O LRT Project, including the Draft Environmental Impact Statement (DEIS) (2015), Combined Final Environmental Impact Statement/Record of Decision (FEIS/ROD) (2016), Supplemental Environmental Assessment (EA), and Amended ROD (2016), evaluated the effects of the light rail project based on a preliminary engineering design referred to herein as the Previous Design. Since the Amended ROD, engineering design advanced, resulting in proposals to refine or modify certain physical and operational aspects of the proposed action. These Proposed Refinements to the Previous Design would modify the limits of disturbance of the D-O LRT Project and require additional evaluations of effects.

This technical report supplements all prior NEPA documentation of natural resources within the D-O LRT Project Corridor and incorporates the prior NEPA documentation by reference. The previous NEPA documents evaluated the effects of the Previous Design on natural resources relative to the No Build Alternative. This Technical Report describes the potential natural resources effects of the D-O LRT Project with the Proposed Refinements relative to the same No Build conditions of the previous NEPA documentation. This report also compares the potential effects of the D-O LRT Project with the Proposed Refinements to the effects of the Previous Design.

1.1 Description of the Proposed Refinements

The Proposed Refinements are based on:

- Advancements in design since the Amended ROD, including refinements resulting from Value Engineering (VE) workshops and evaluation of additional measures to reduce project cost;
- Responses to public comments and stakeholder feedback on the previous NEPA documentation and the Amended ROD;
- Recommendations from the Transit Oriented Development grant study to optimize platform locations for future development; and
- Recommendations from the updated Durham County and Orange County transit plans.

The major refinements discussed in this Supplemental EA include:

- Modification to the station platform lengths;
- Adjustments to the location and configuration of the station platforms, as well as corresponding refinements to the track alignments;
- Modifications to the planned park-and-ride lots;
- Inclusion of bicycle and pedestrian facilities throughout the project;
- Changes in the locations and number of Traction Power Substations;
- Reconfiguration of the Rail Operations and Maintenance Facility (ROMF) and rail yard;
- Using single-track configuration for segment that includes New Hope Creek and Sandy Creek bridge crossings;
- Revision to the alignment to pass underneath the intersection of University Drive and Shannon Road, rather than cross through the intersection at grade;
- Elevation of the alignment on Erwin Road;

- Addition of a new station at Blackwell/Mangum Streets and a pedestrian/bicycle signature civic space that would span Pettigrew Street, the light rail tracks, NCRR tracks, and Ramseur Street approximately mid-block between Blackwell Street and Mangum Street; and
- Inclusion of drainage, grading, and site preparation throughout the project.

2. Legal and Regulatory Framework

The legal and regulatory framework Identified in Appendix K21 of the DEIS remains relevant to the natural resources potentially affected by the Proposed Refinements.

3. Methodology and Qualifications

Information regarding the relevant natural resource areas was collected from a review of United States Fish and Wildlife Service (USFWS) Threatened and Endangered Species databases, the North Carolina Natural Heritage Program's (NCNHP) databases (as of January 2018), Durham and Orange County's soil surveys, aerial photography, topographic maps, and technical staff field investigations. The most current available data from local sources and recent aerial photography were used in the analysis. A field site visit will be conducted by a biologist during the appropriate 2018 growing season survey windows.

The assessment of effects was limited to the updated limits of construction associated with the Proposed Refinements. The natural resources evaluation assessed site-specific effects, the significance of these effects, and what potential mitigation measures could be implemented. The extent of and effects to habitat connections, including the New Hope Creek and Sandy Creek corridors, were also addressed.

Please refer to the following for any additional methodology associated with the Proposed Refinements:

- DEIS Appendix E – Legal and Regulatory Context
- DEIS Appendix K13 – Environmental Methodology Report

4. Affected Environment

Below are discussions of existing conditions for natural resources potentially affected by the Proposed Refinements. Several resources, including coastal zones, Coastal Area Management Act Areas of Environmental Concern, Construction Moratoria, and Essential Fish Habitat are not within the Previous Design or the Proposed Refinements and are not discussed further.

4.1 Physical Resources

The Proposed Refinements are within the ecoregions described in Appendix K21 of the DEIS. General descriptions of topography and land use also still apply.

4.1.1 Soils

Soil types in the Proposed Refinements study area are similar to those described in the Natural Resources Conservation Service (NRCS) data for Durham and Orange Counties, as described in Appendix K21 of the DEIS and Appendix F of the 2016 Supplemental EA for the North Carolina Central University (NCCU) Station Refinement. There were five soil types within the Proposed Refinements study area (**Table 4-1**) that were not described in Appendix K21 of the DEIS or Appendix F of the 2016 Supplemental EA for the NCCU Station Refinement. There are areas in the Previous Design that would no longer be developed because of the changes in the Proposed Refinements. Soils that were previously analyzed that are no longer within the Proposed Refinements study area include Altavista silt loam, Cecil fine sandy loam, Pacolet fine sandy

loam, Enon loam, Georgeville-Urban land complex, Goldston channery silt loam, Granville sandy loam (6 to 10 percent slope), Iredell loam, Louisburg (Wateree) sandy loam, Maydan sandy loam (15 to 25 percent slope), Mayodan Urban land complex (0 to 10 percent slope), Tarrus silt loam, and Wilkes gravelly loam. Soils were determined based on a one-quarter mile search range from the Proposed Refinements.

Table 4-1: Soils within the Proposed Refinements

Soil Series	Mapping Unit	Drainage Class	Hydric Status	Bedrock Depth (inches)
Chewacla loam; 0-2% slope	Ch	Frequently Flooded	Hydric	>80
Creedmoor fine sandy loam; 2-8% slope	CrB	Moderately Well Drained	Non-hydric	>60
Wehadkee silt loam; 0-2% slope	Wn	Frequently Flooded	Hydric	>60
White Store sandy loam; 2-6% slope	WsB	Moderately Well Drained	Non-hydric	40 to 72
White Store-Urban land complex; 0-10% slope	WwC	Moderately Well Drained	Non-hydric	40 to 72

4.1.2 Farmlands

Please see Appendix K21 in the DEIS for a description of farmland within the study area for the Previous Design. The Proposed Refinements would not affect farmland.

4.1.3 Water Resources

There are minimal changes to water resources since the Amended ROD. For more information, please see the Water Resources Technical Report at **appendix H** of the Supplemental EA for the Proposed Refinements.

4.2 Biotic Resources

4.2.1 Terrestrial Communities

The additional impact area associated with the Proposed Refinements would result in impacts to the four terrestrial communities (maintained/disturbed, mesic mixed forest, alluvial hardwood forest, and bottomland hardwood forest) described in Appendix K21 of the DEIS and Appendix F of the 2016 Supplemental EA for the NCCU Station Refinement. These communities are shown in **attachment G.1** (**Figure 16** through **Figure 31**). Scientific names of all species identified in these four terrestrial communities are included in **attachment G.2**.

The NCNHP has identified select unique habitat areas throughout North Carolina as NHP Natural Areas (NHPNA), formerly called Significant Natural Heritage Areas (SNHA). These areas are considered especially valuable because they contain special habitats, rare species, or ecologically significant natural communities, and are considered reservoirs of biological diversity. NHPNA designation does not confer legally mandated protections; however, this status does imply that these areas will be given special consideration during an environmental review process. An overview of the NHPNAs present within the Proposed Refinements is provided in **Figure 32** of **attachment G.1**. The two NHPNAs that would be impacted by the Proposed Refinements are the Little Creek Bottomlands and Slopes (**Figure 33**) and the

New Hope Creek Bottomland Forest (**Figure 34**). The other NHPNAs that are shown in **Figure 32** through **Figure 34** are outside of the areas that would be impacted by the Proposed Refinements.

4.2.2 Terrestrial Wildlife

Species surveys for the DEIS were completed between August 2013 and August 2014. The Proposed Refinements would occur in the same habitats described in the study area for the Previous Design, and wildlife composition potentially affected under the Proposed Refinements is expected to be similar (Burt, 1976; Martof et al., 1980; Sather et al., 2004; Sibley, 2003; Duke University, 2015). Due to the disturbed nature of the area of the Proposed Refinements, all animal species expected to occur within this area are opportunistic species.

4.2.3 Aquatic Communities

The same species identified in aquatic communities described in Appendix K21 of the DEIS are expected to occur in the study area for the Proposed Refinements.

4.2.4 Bottomland Hardwood Forest

There are no changes to species identified in bottomland hardwood forest communities described in Appendix K21 of the DEIS.

4.3 Jurisdictional Issues

The study area for the Proposed Refinements includes natural resources that are regulated by various federal and state authorities (e.g., USACE, USFWS, NCDA, NCDEQ, and NCWRC). Jurisdictional issues are described in the following sections.

4.3.1 Clean Water Act of the U.S.

Water resources regulated by the Clean Water Act under the Proposed Refinements are similar to those described in Appendix K21 of the DEIS. Please see the Water Resources Technical Report at **appendix H** of the Supplemental EA for the Proposed Refinements for a discussion on jurisdictional water resources.

The Proposed Refinements would require a United States Army Corps of Engineers (USACE) Individual Permit for the purposes of Section 404 certification, which would include authorization for the Previous Design and the Proposed Refinements. This permit must be accompanied by an individual Section 401 Water Quality Certification. The USACE holds the final discretion as to what permit would be required to authorize project construction. Please see the Water Resources Technical Report at **appendix H** of the Supplemental EA for the Proposed Refinements for more information.

4.3.2 Construction Moratorium

As described in Appendix K21 of the DEIS, there are no construction moratoria that would apply to streams or waters in the Previous Design and Proposed Refinements study areas.

4.3.3 N.C. River Basin Buffer Rules

Water resources in the Proposed Refinements study area are part of the Cape Fear River Basin (United States Geologic Survey [USGS] Hydrologic Unit 03030002). There are no changes to the project activities regulated by the North Carolina River Basin Buffer Rules described in Appendix K21 of the DEIS.

4.3.4 Rivers and Harbors Act Section 10 Navigable Waters

There are no surface waters identified as "Navigable Waters" under Section 10 of the Rivers and Harbors Act within the study areas for the Previous Design or Proposed Refinements.

4.3.5 Endangered Species Act Protected Species

The USFWS lists two federally protected species for Durham County and four federally protected species Orange County (**Table 4-2**, updated June 27, 2018).

The Proposed Refinements would be located within federal or state-listed threatened or endangered species habitats. Of the four federally protected species listed for Durham and Orange Counties, two species, Michaux's sumac and smooth coneflower, have the potential to occur within the Proposed Refinements study area. A brief description of each species' habitat requirements follows, along with the Biological Conclusion rendered based on survey results in the study area. Pedestrian field surveys for smooth coneflower and Michaux's sumac will be conducted during the 2018 optimum survey window to supplement these findings. Habitat requirements for each species are based on the current best available information from the referenced literature.

Table 4-2: Federally Protected Species Listed for Durham and Orange Counties

Scientific Name	Common Name	Federal Status	Habitat Present	Biological Conclusion	County[1,2]
Rhus michauxii	Michaux's sumac	Endangered	Yes	May Affect, Not Likely to Adversely Affect	Durham/ Orange
Echinacea laevigata	Smooth coneflower	Endangered	No	No Effect	Durham/ Orange
Alasmidonta heterodon	Dwarf wedgemussel	Endangered	No	No Effect	Orange
Notropis mekistocholas	Cape Fear shiner	Endangered	No	No Effect	Orange

Notes:
1: The status of the Neuse River waterdog is currently under review by the USFWS. Once a determination is made on the species, this table will be updated.
2: The Northern long-eared bat is not listed in Durham or Orange Counties; however, per the discussion in the Amended ROD, periodic reviews of county species lists will be conducted to confirm the current status of this species.
Source: USFWS Database (last updated 06/27/18); USFWS 2017a; USFWS 2017b; USFWS 2017c

4.3.5.1 Michaux's Sumac

USFWS optimal survey window: May through October

Habitat Description: Please see Appendix K21 of the DEIS for a description of Michaux's sumac habitat.

Biological Conclusion: May Affect, Not Likely to Adversely Affect

Suitable habitat for Michaux's sumac was present in the DEIS study area along the roadside shoulders and utility easements. However, no individual specimens were found during the survey. . A review of the NCNHP records, updated January 2018, indicates no known Michaux's sumac occurrences within 1.0 mile of the Proposed Refinements study area (NCNHP 2018). GoTriangle conducted a survey for Michaux's sumac and its habitat in June 2018 (i.e., during the optimum survey window of May through October) in the Proposed Refinements study area and found none.

4.3.5.2 Smooth Coneflower

USFWS optimal survey window: late May through October

Habitat Description: Please see Appendix K21 of the DEIS for a description of smooth coneflower habitat.

Biological Conclusion: No effect

No suitable habitat for this species was identified within the DEIS project study area, and no individuals were found during a 2013 survey. A review of the NCNHP records, updated January 2018, indicates three historical occurrences of smooth coneflower (most recently observed in 1992) within 1.0 mile of the Proposed Refinements study area (NCNHP 2018). GoTriangle conducted a new survey for smooth coneflower and its habitat during the optimal survey window in June 2018 and found no areas of suitable habitat.

4.3.5.3 Dwarf Wedgemussel

Dwarf wedgemussel only occurs in the Neuse and Tar River drainages and would not be present in the study area for the Proposed Refinements. As a result, it is not discussed further.

4.3.5.4 Cape Fear Shiner

The Cape Fear shiner only occurs within the Deep, Raw, Haw, and Cape Fear rivers and would not be present in the study area for the Proposed Refinements. As a result, it is not discussed further.

4.3.5.5 Red-cockaded Woodpecker

The red-cockaded woodpecker is no longer listed in Durham or Orange Counties.

4.3.5.6 Northern Long-eared Bat

The Northern long-eared bat is not listed in Durham or Orange Counties; however, per the discussion in the Amended ROD, periodic reviews of county species lists will be conducted to confirm the current status of the Northern long-eared bat. If the bat is listed in the county and tree removal has not yet been completed for the project, then GoTriangle will consult with USFWS at that time.

4.3.6 State Endangered Species Act

The North Carolina Endangered Species Act protects all listed species from either taking or possession. All federally listed species are included on the state list. The NCNHP currently lists 29 species (15 endangered, 14 threatened) for Durham and Orange Counties. Of those, only the state-threatened Virginia spiderwort was not previously discussed in Appendix K21 of the DEIS or Appendix F of the 2016 Supplemental EA for the NCCU Station Refinement. Species previously discussed in Appendix K21 of the DEIS or Appendix F of the 2016 Supplemental EA for the NCCU Station Refinement that are no longer listed within Durham and Orange Counties include red-cockaded woodpecker, dwarf wedgemussel, American bluehearts, pondberry, southern skullcap, veined skullcap, glad bluecurls, Chapman's redtop, and Buffalo clover.

4.3.7 Bald Eagle and Golden Eagle Protection Act

Please see Appendix K21 of the DEIS for a description of bald eagle habitat. Because there is no habitat within the study area that might be considered suitable habitat for eagle nesting or foraging, no detailed surveys for eagle nests or nesting habitat are planned within the study area or within a 660-foot buffer. However, per the Amended ROD, if it becomes evident that bald eagles are using the Proposed

Refinements study area, surveys would be conducted. A review of the NCNHP records, updated January 2018, indicates no known bald eagle occurrences within one mile of the Proposed Refinements study area (NCNHP 2018).

4.3.8 Migratory Bird Treaty Act

Please see Appendix K21 of the DEIS and Appendix F of the 2016 Supplemental EA for the NCCU Station Refinement for a description of the Migratory Bird Treaty Act of 1918. A number of observed and expected bird species are located in the Previous Design and Proposed Refinements study areas that fall under the purview of the Migratory Bird Treaty Act of 1918. The Proposed Refinements are located in the same area as the Previous Design with respect to migratory bird habitat and pathways. The NEPA documentation for the Previous Design determined migratory birds are not likely to be adversely affected by the proposed project. The Proposed Refinements would not introduce new impacts to migratory birds relative to the Previous Design.

4.3.9 Endangered Species Act Candidate Species

In a list updated on June 27, 2018, the USFWS identified no candidate species under the Endangered Species Act of 1973 (ESA) for Durham and Orange Counties. For this reason, no effects to ESA candidate species would occur as a result of the Proposed Refinements.

5. Environmental Consequences

The analysis in this section provides a comparison of the Previous Design to the D-O LRT Project with Proposed Refinements. The Proposed Refinements would change the impacts on natural resources relative to the Previous Design.

As noted in the previous NEPA documentation, the No Build Alternative would have no project-related impacts on natural resources. The effects of the Previous Design and the effects of the D-O LRT Project with Proposed Refinements presented in this section can be compared to zero impacts of the No Build Alternative.

5.1 Biotic Communities within the Proposed Refinements

The Previous Design would have resulted in disturbance to 334 acres of biotic communities. The D-O LRT Project with the Proposed Refinements would result in a 57-acre increase in development within biotic communities compared to the Previous Design. **Table 5-1** provides a comparison of the acreage of each biotic community within the limits of construction proposed for the Previous Design and the D-O LRT Project with the Proposed Refinements.

Table 5-1: Impacts to Biotic Communities in the Study Area

Biotic Community	Previous Design (acres)	D-O LRT Project with Proposed Refinements (acres)	Change (+/-)
Alluvial	4	6	+2
Bottomland	4	3	-1
Mesic Mixed	88	108	+20
Maintained	238	274	+36
Total	**334**	**391**	**+57**

5.2 NHP Natural Areas within the Proposed Refinements

The Proposed Refinements would result in 3 additional acres of impact on the Little Creek Bottomlands and Slopes NHPNA, no additional impact on New Hope Creek Bottomland Forest NHPNA, and 3.5 additional acres of impact to gameland. The Proposed Refinements would avoid 0.2 acre of the impact to the Little Creek Bottomlands and Slopes NHPNA, 0.3 acre of New Hope Creek Bottomland Forest NHPNA, and 0.3 acre of gamelands from the study area for the Previous Design. The Proposed Refinements would result in an additional 5.7 acres of impact on NHPNAs.

6. Mitigation

6.1 Wetland and Stream Mitigation

Wetland and stream mitigation measures would be the same as those described in Appendix K22 of the DEIS and in Section 4.8 of the Amended ROD.

6.1.1 Avoidance and Minimization of Impacts

Under the Proposed Refinements, avoidance and minimization of impacts, including the use of best management practices, would be implemented as described in the Amended ROD.

6.1.2 Compensatory Mitigation of Impacts

As described in the Amended ROD, specific compensatory mitigation measures will be developed in consultation with the USACE and NCDWR Section 404/401 permitting process that will occur during project design.

6.2 Wildlife Mitigation

Wildlife mitigation measures would be the same as those described under the Amended ROD.

7. References

Burt, W.H. and Grossenheider, R.P. 1976. *A Field Guide to the Mammals of North America, Third Edition*. The Peterson Field Guide Series. Boston, MA.

Griffith, G.E., Omernik, J.M., Comstock, J.A., Schafale, M.P., McNab, W.H., Lenat, D.R., and MacPherson, T.F. 2002. *Ecoregions of North Carolina* (map scale 1:1,500,000). U.S. EPA. Corvallis, OR.

Martof, B.S., Palmer, W.M., Bailey, J.R., and Harrison, J.R., III 1980. *Amphibians and Reptiles of the Carolinas and Virginia*. The University of North Carolina Press, Chapel Hill, North Carolina. 264 pp.

North Carolina Natural Heritage Program (NCNHP). 2018. NCNHP Element Occurrence GIS Shapefiles. http://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=8b1c7bf2303740e88fc2d870b054e1bd (Updated January 2018).

Schafale, M.P. and Weakley, A.S. 1990. *Classification of the Natural Communities of North Carolina: Third Approximation*. Natural Heritage Program, Division of Parks and Recreation, N.C. Department of Environment, Health, and Natural Resources, Raleigh, NC. 325 pp.

Sibley, D.A. 2003. *The Sibley Field Guide to Birds of Eastern North America*. National Audubon Society. New York, NY.

U.S. Fish and Wildlife Service (USFWS). 2017a. *Dwarf wedgemussel*. http://www.fws.gov/raleigh/species/es_dwarf_wedgemussel.html. (Accessed 01/26/18).

U.S. Fish and Wildlife Service (USFWS). 2017b. *Michaux's Sumac*. http://www.fws.gov/raleigh/species/es_michauxs_sumac.html. (Accessed 01/26/18).

U.S. Fish and Wildlife Service (USFWS). 2017c. *Smooth Coneflower*. http://www.fws.gov/raleigh/species/es_smooth_coneflower.html. (Accessed 01/26/18).

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Attachments

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Attachment G.1: Figures

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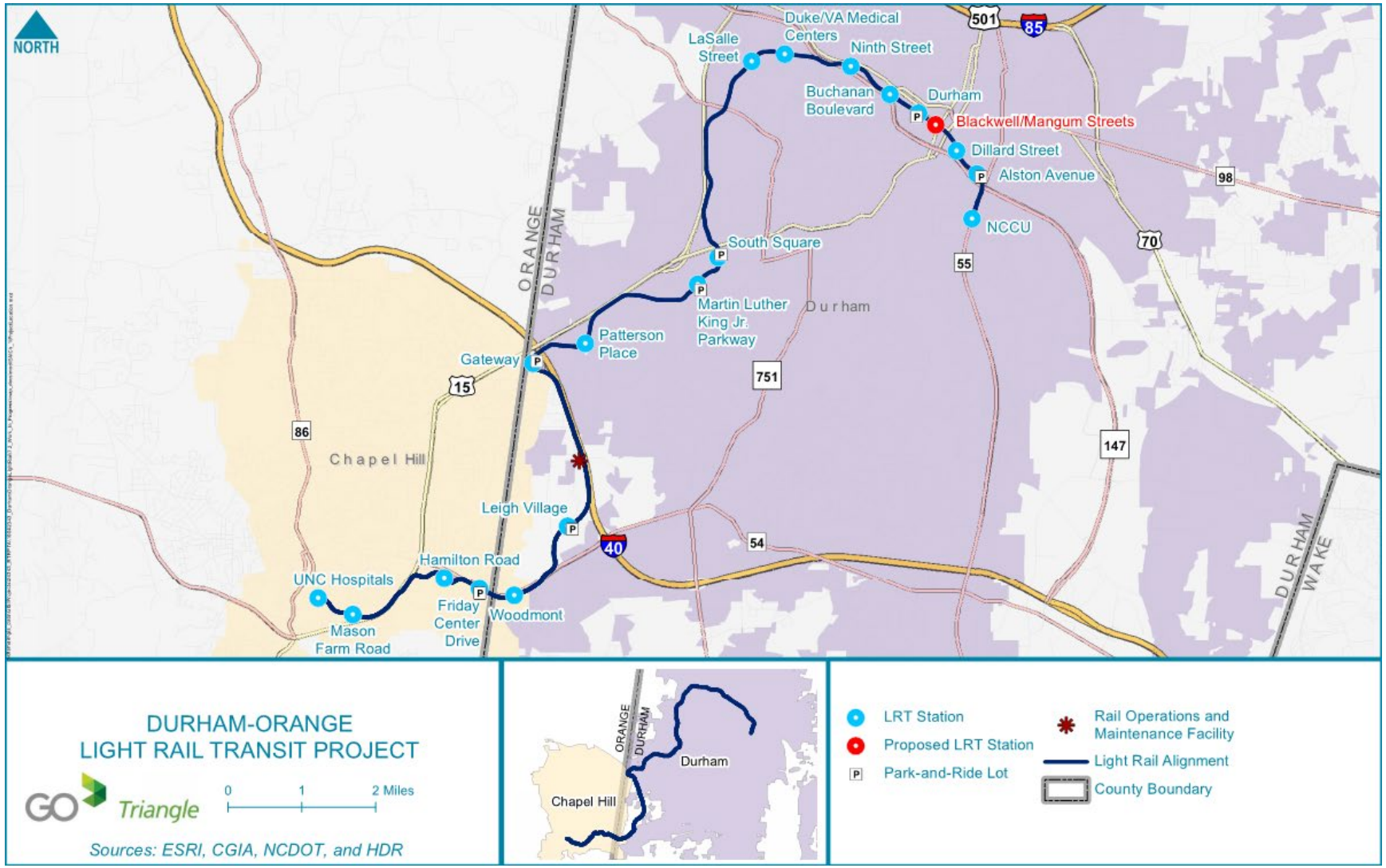


Figure 1: Project Overview

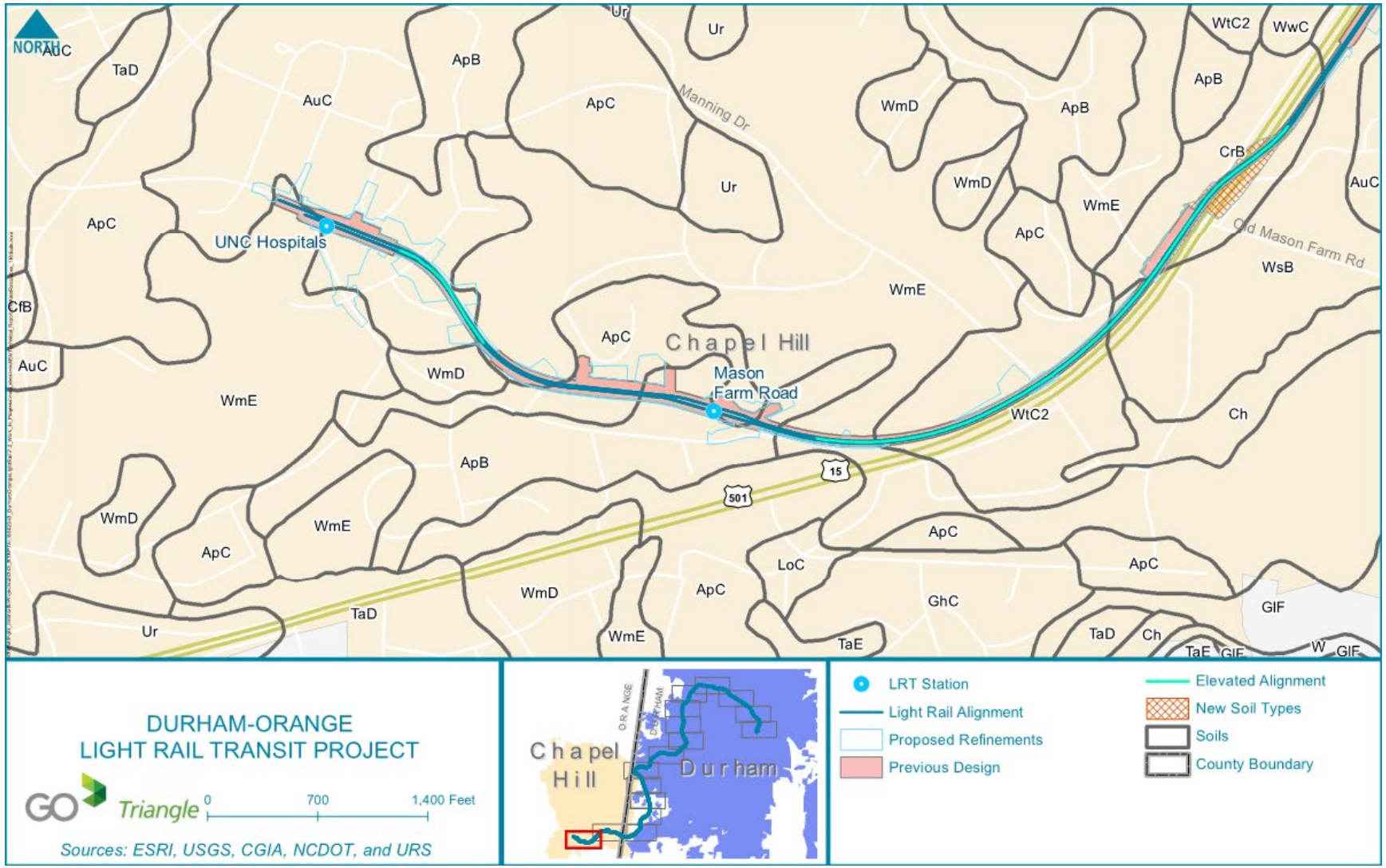
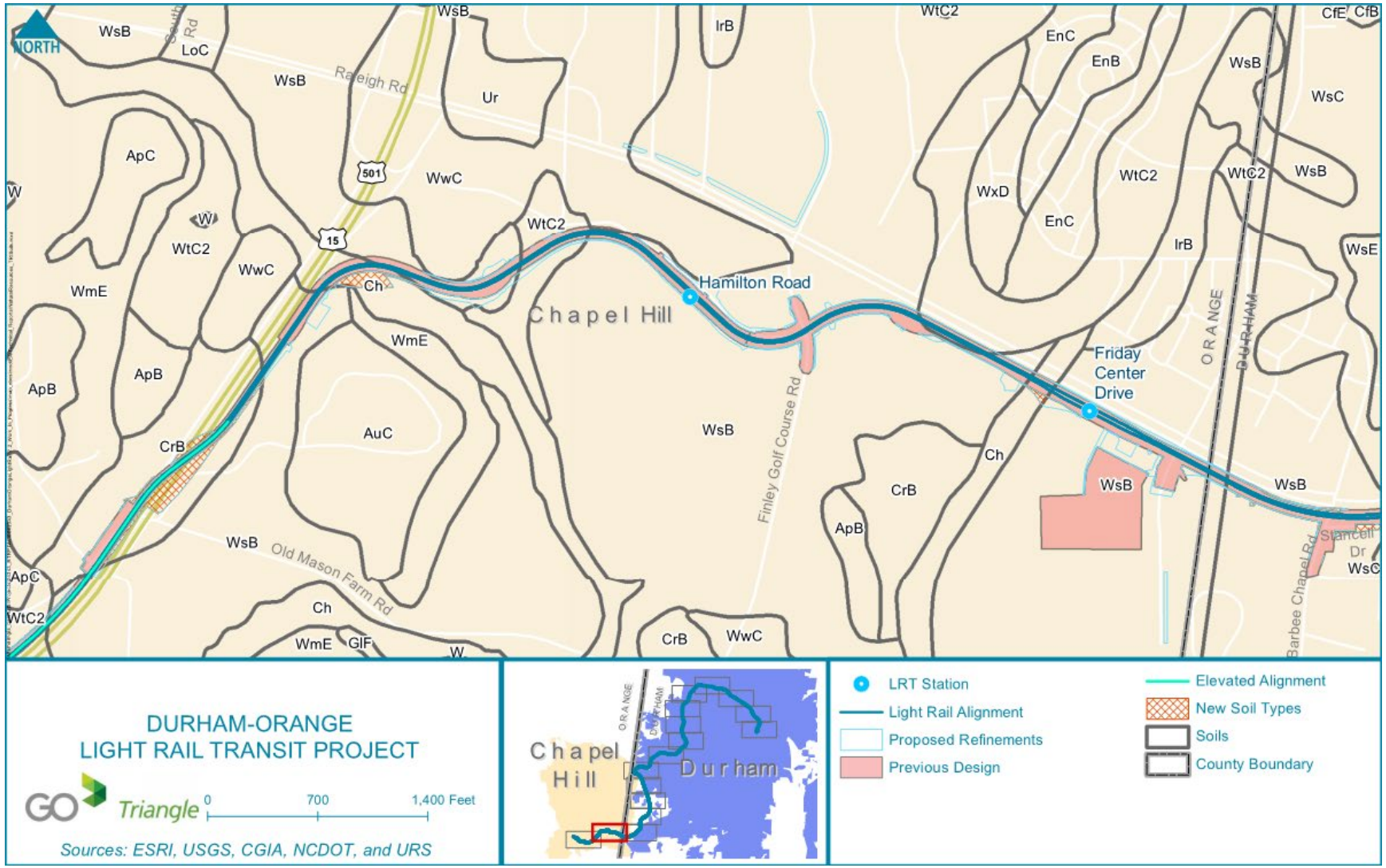


Figure 2: Soils



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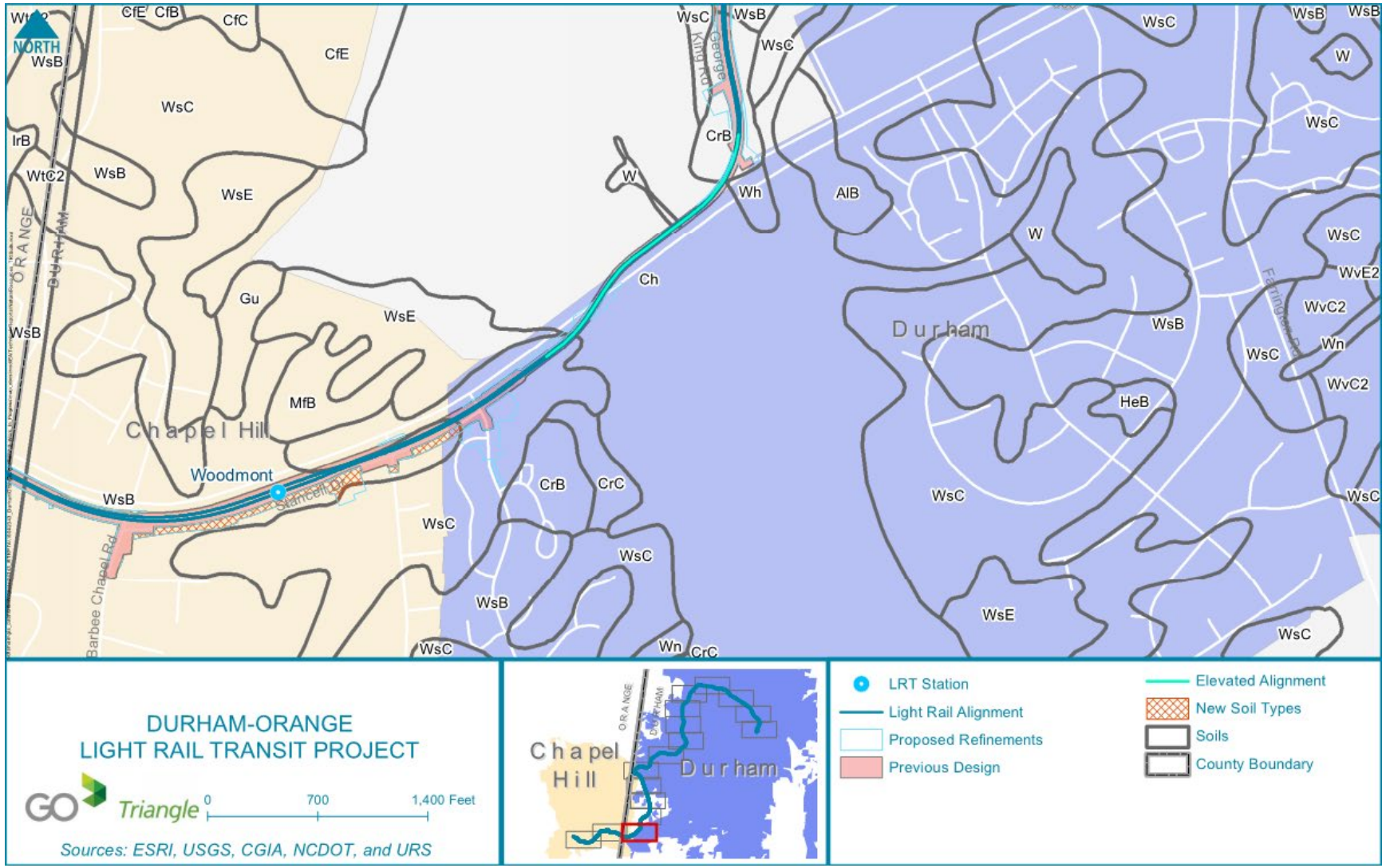

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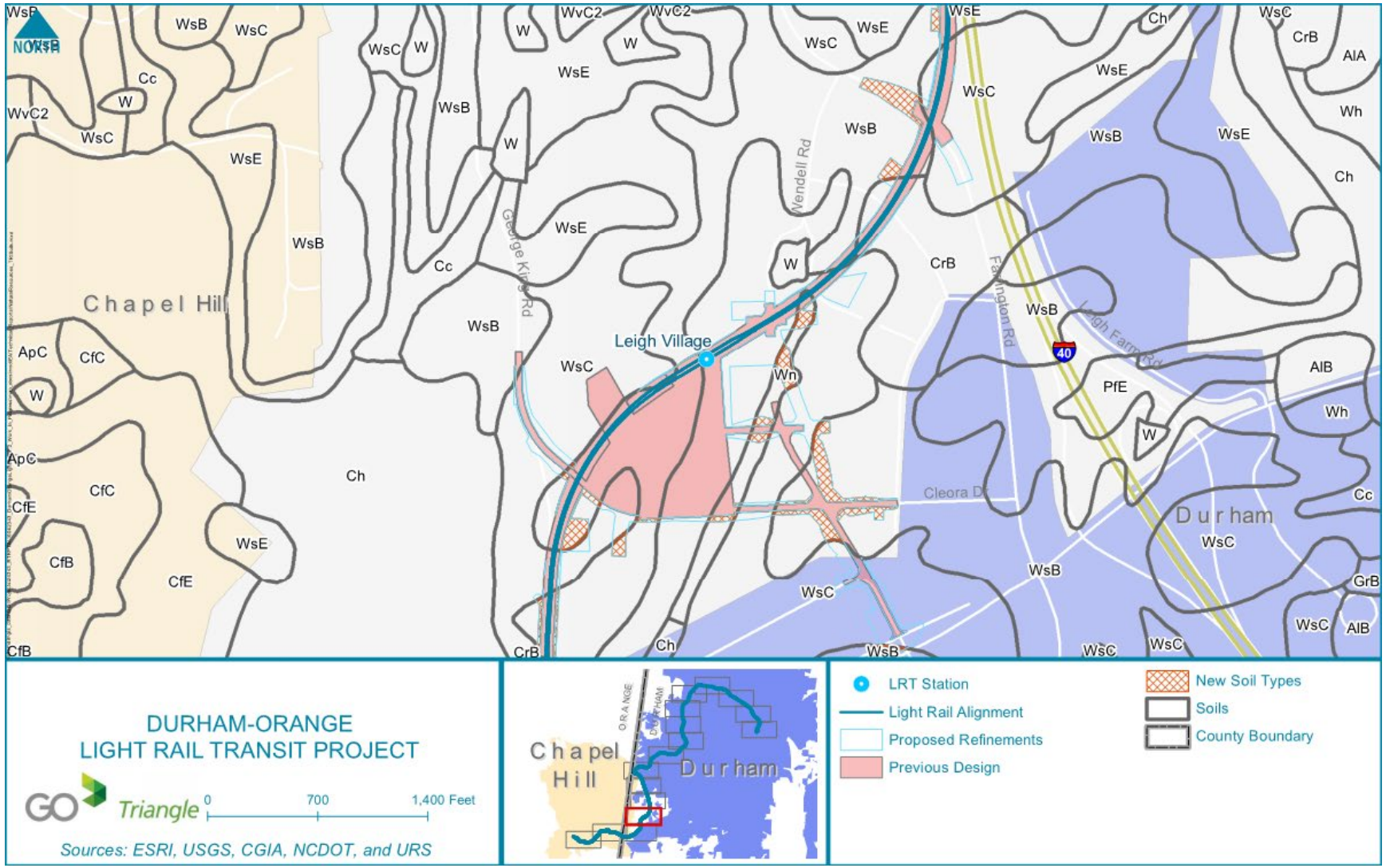
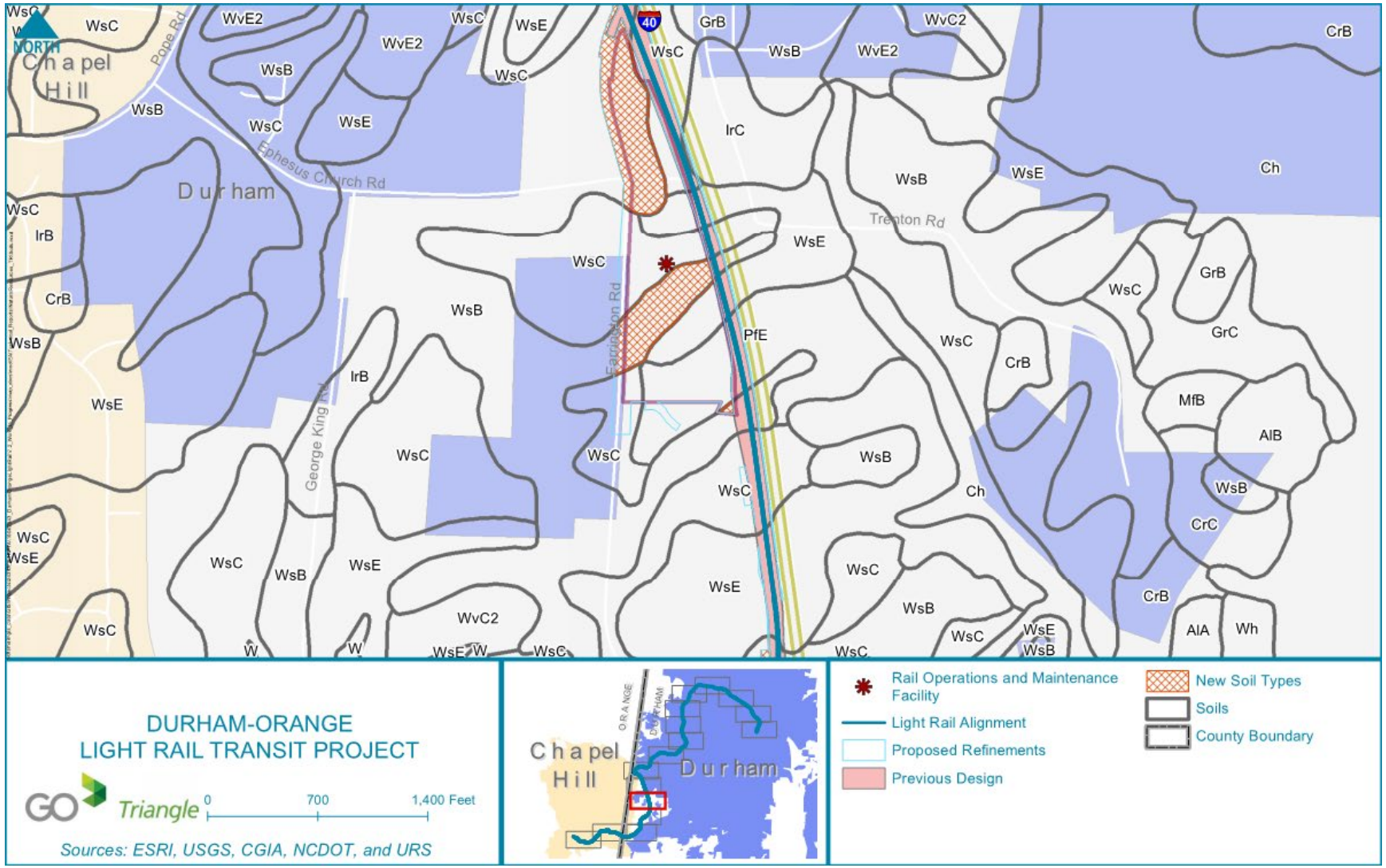


Figure 5: Soils



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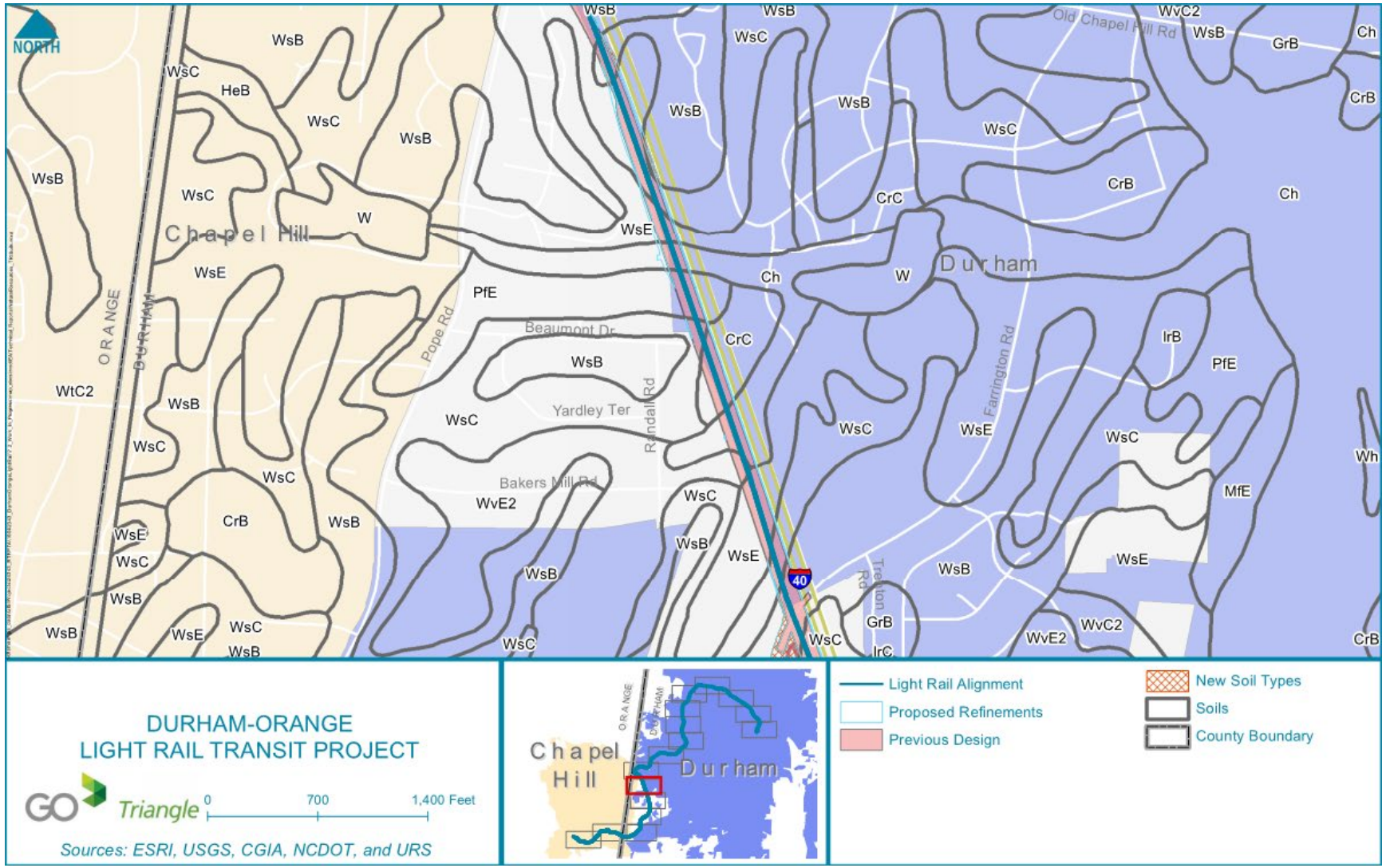


Figure 7: Soils

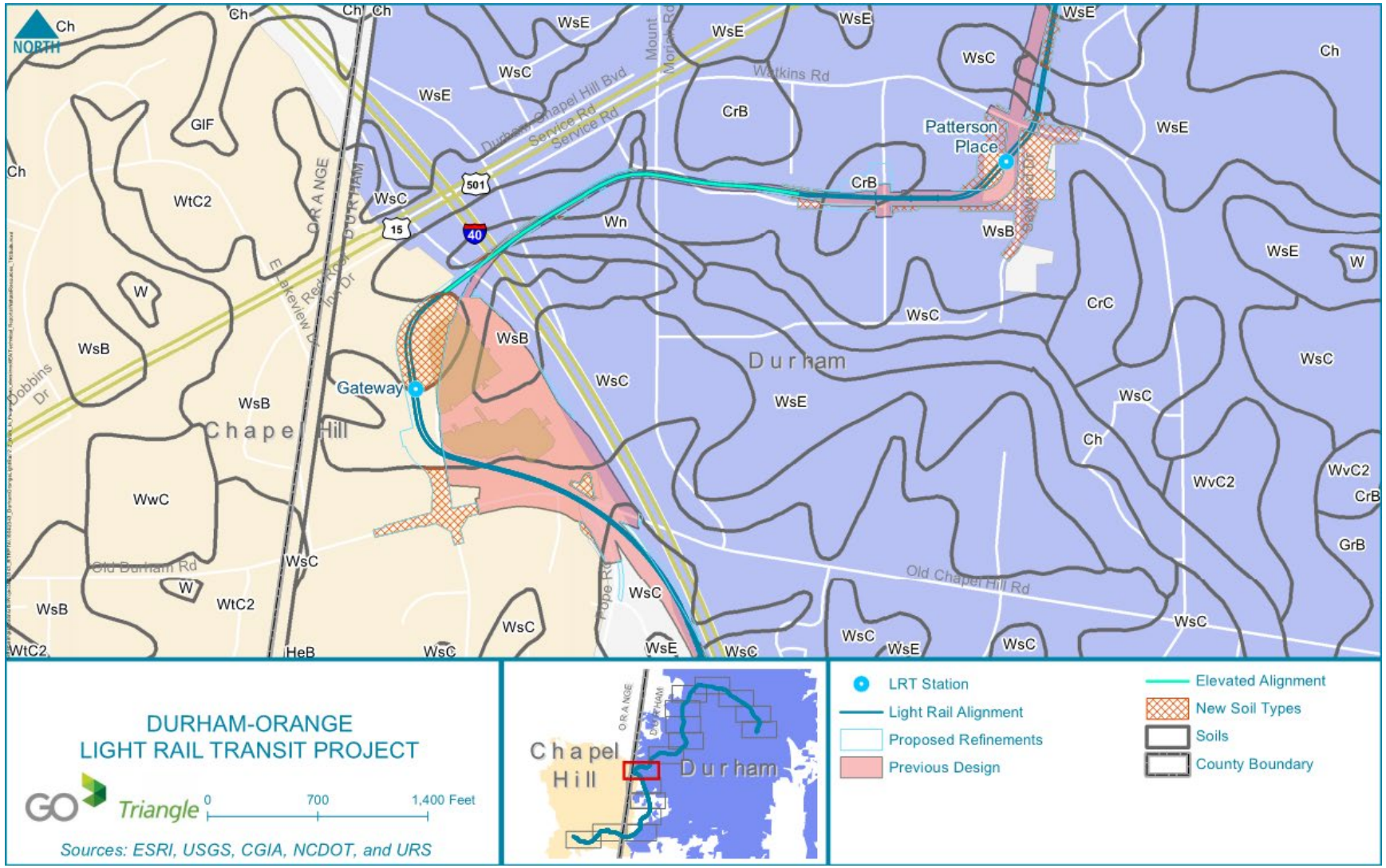


Figure 8: Soils

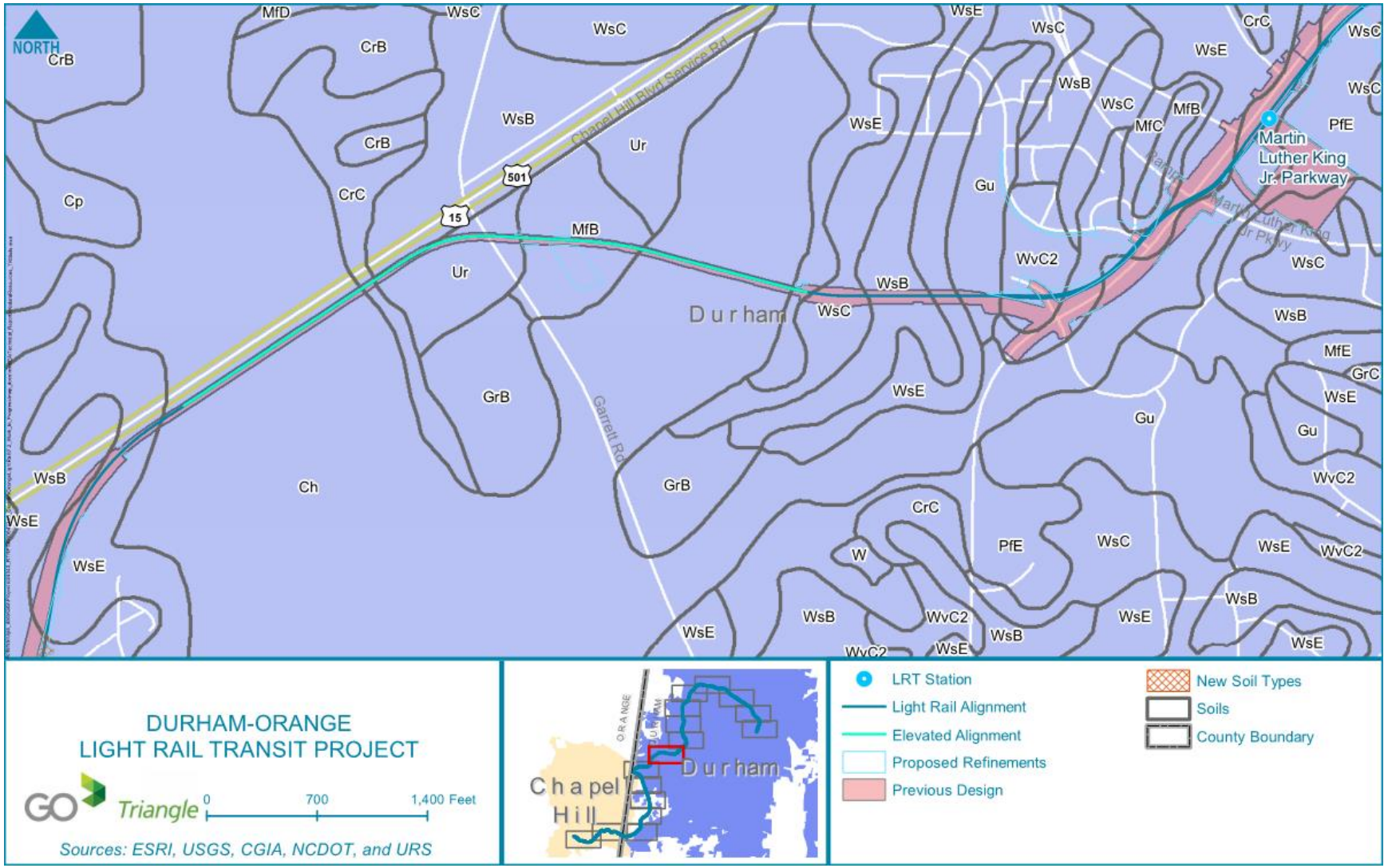


Figure 9: Soils

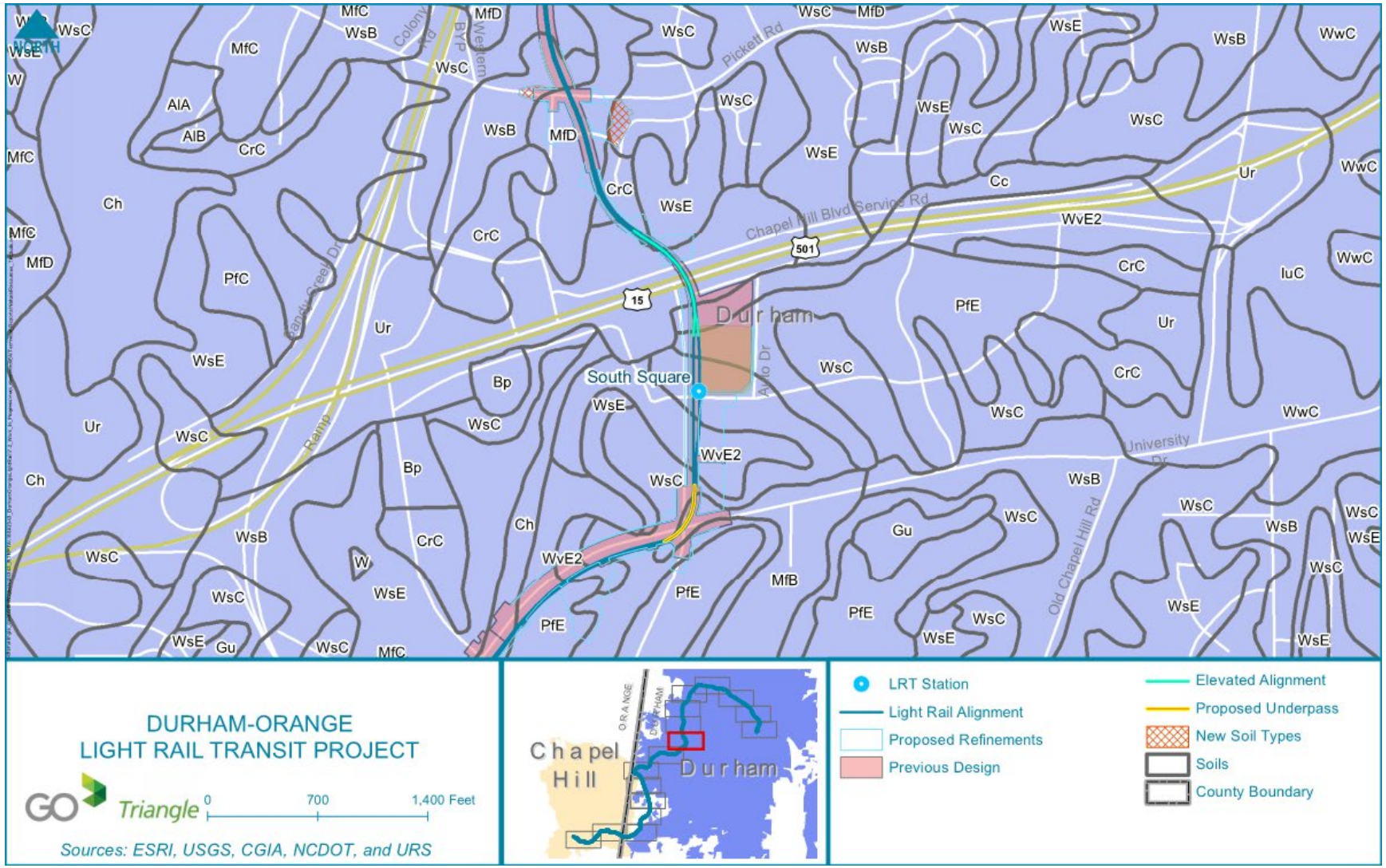
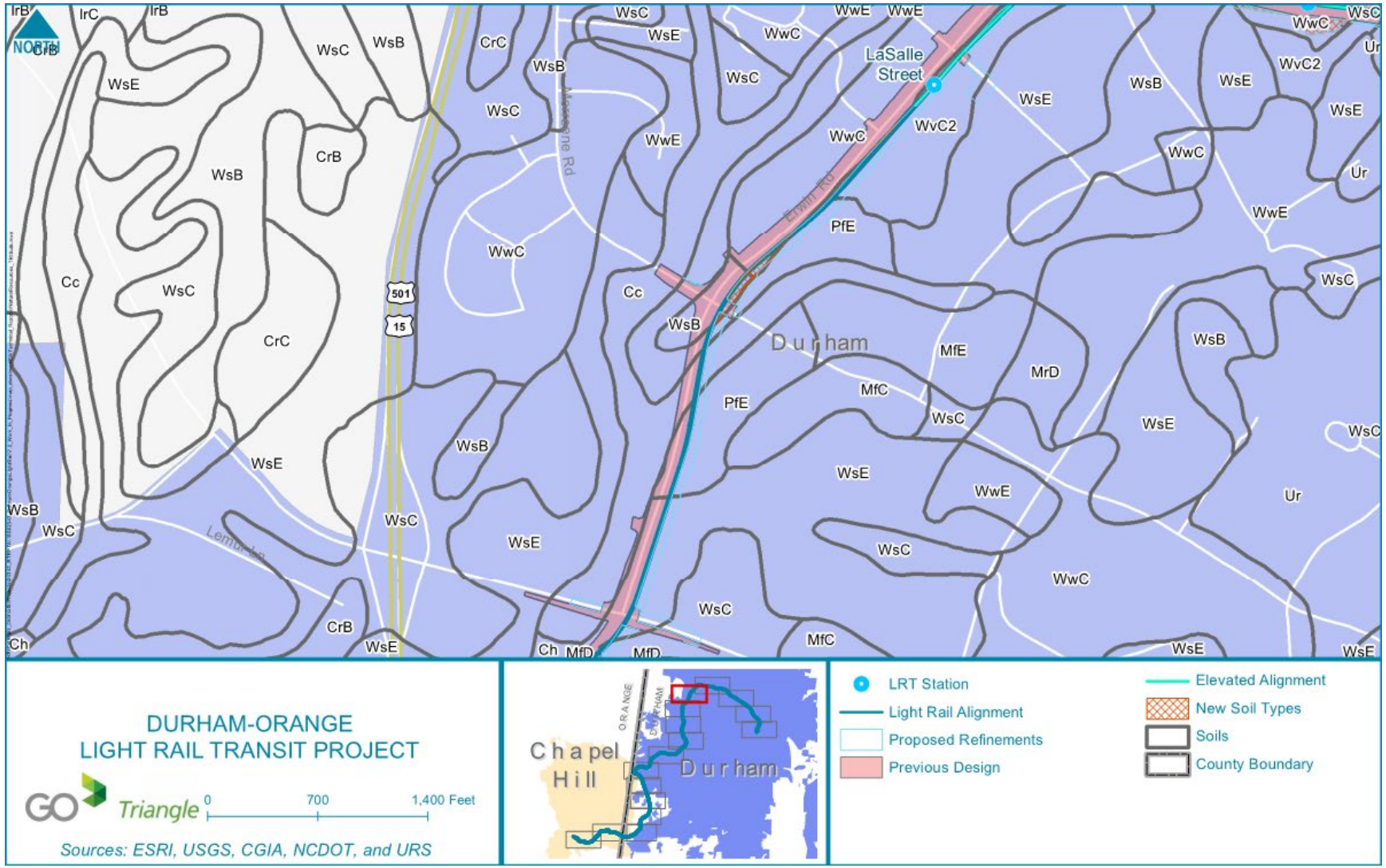


Figure 10: Soils



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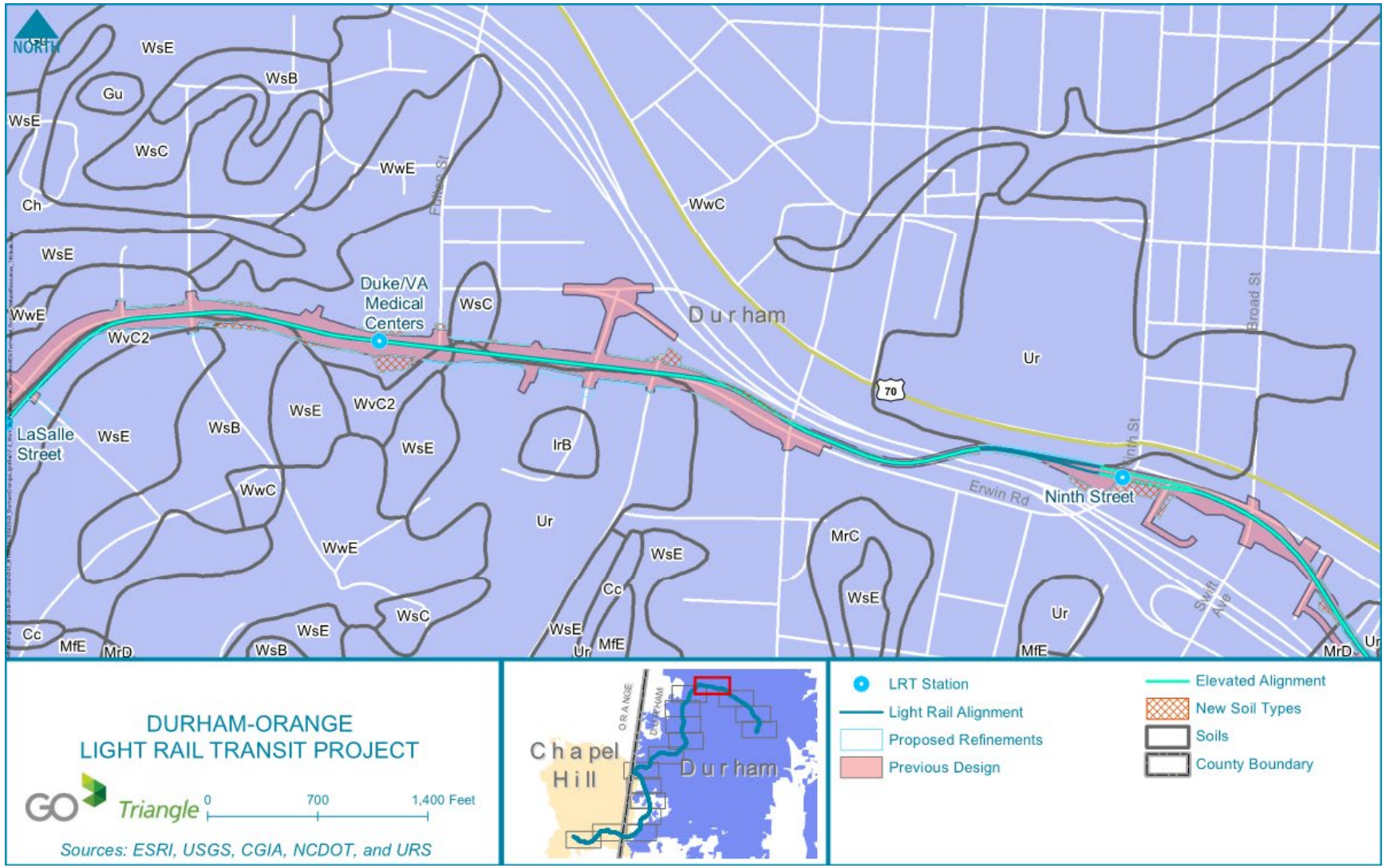


Figure 12: Soils

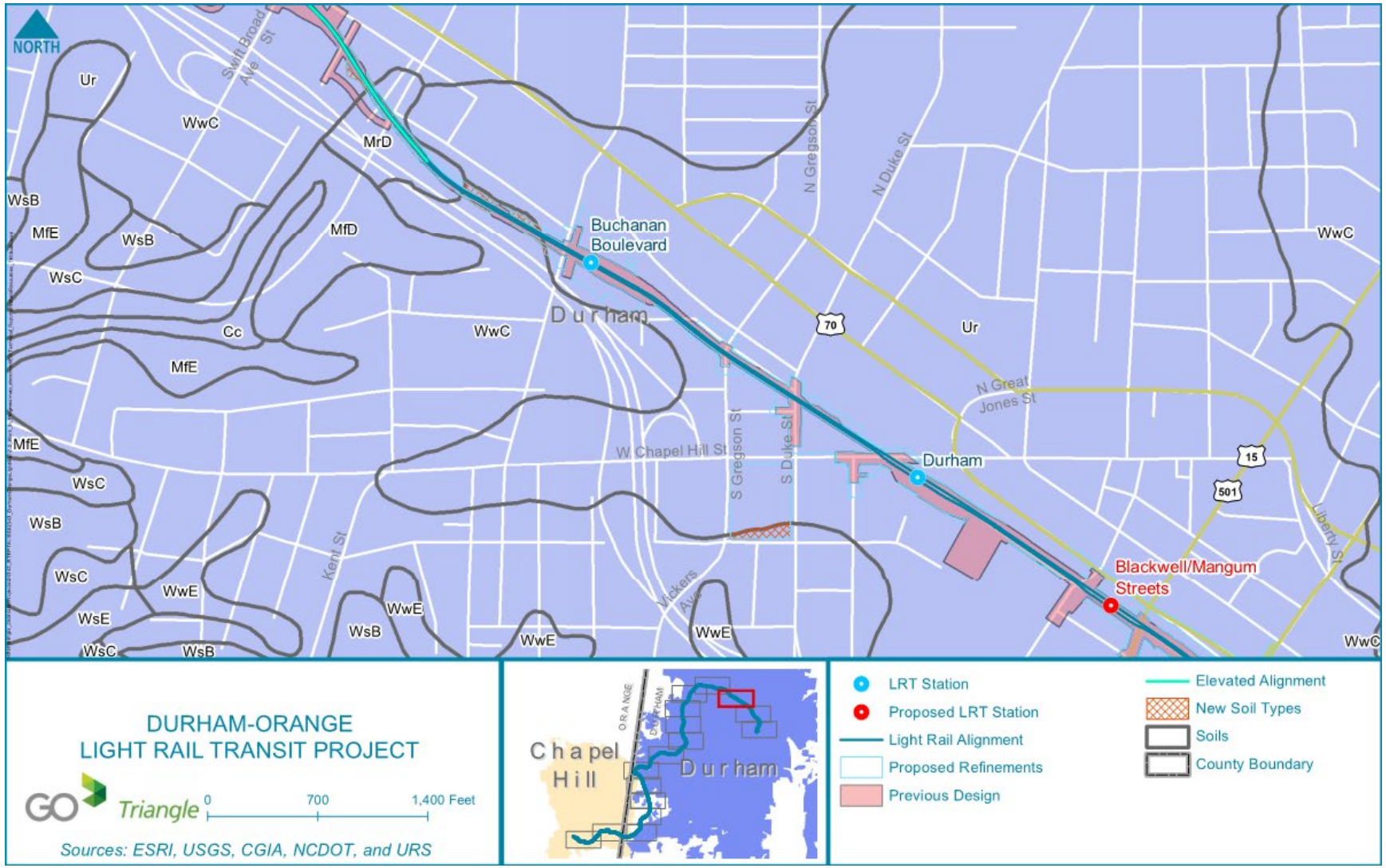


Figure 13: Soils

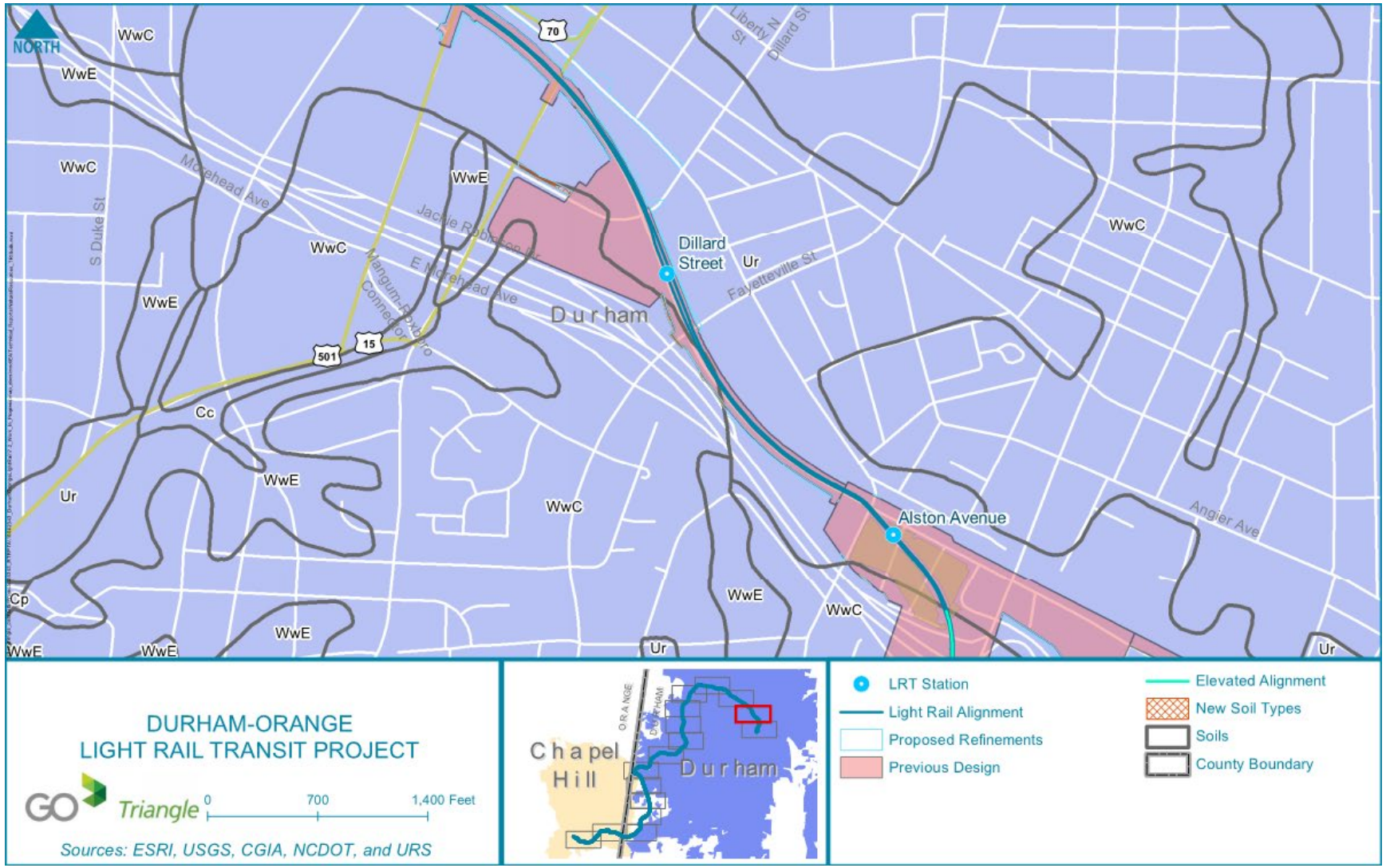


Figure 14: Soils

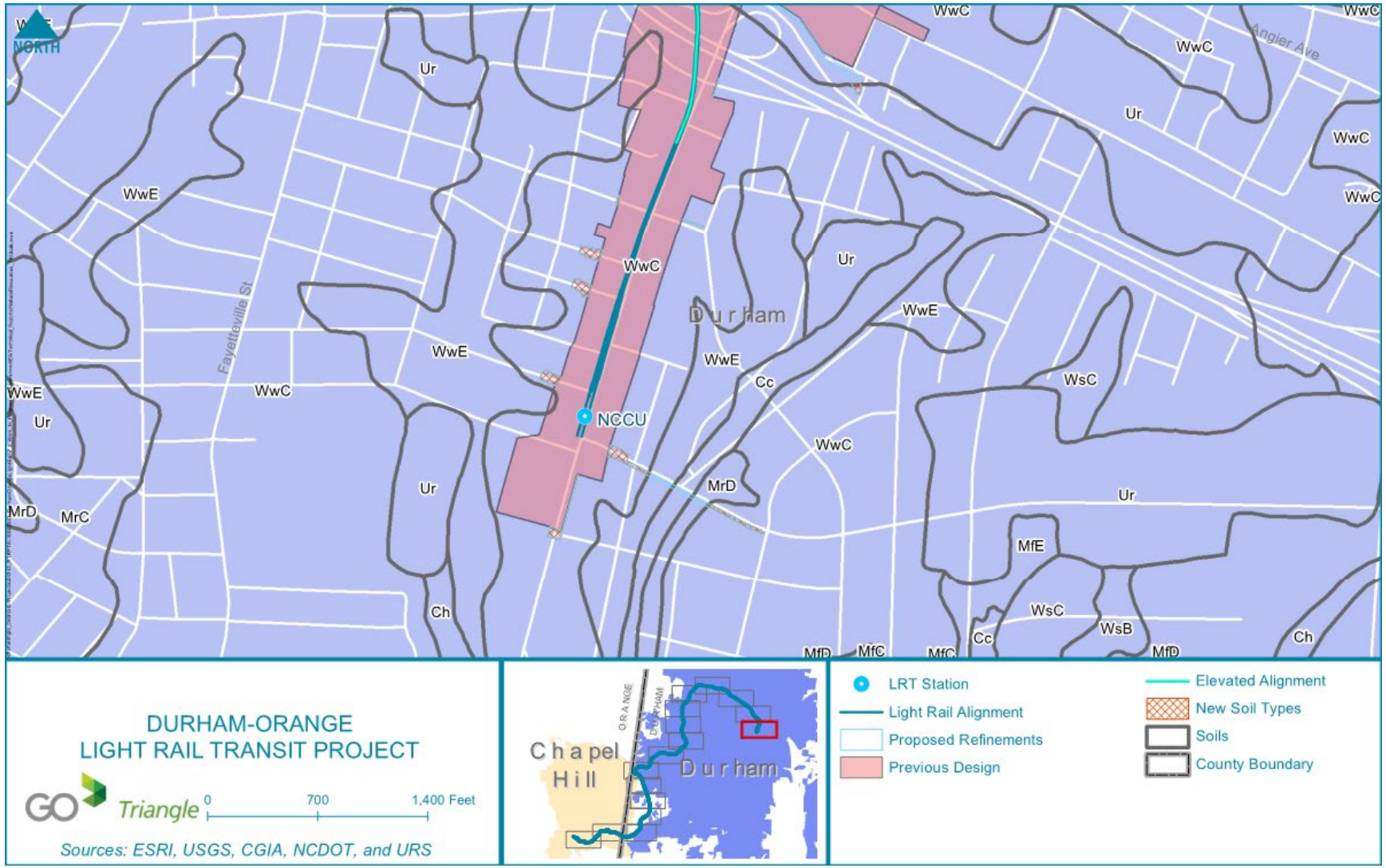


Figure 15: Soils

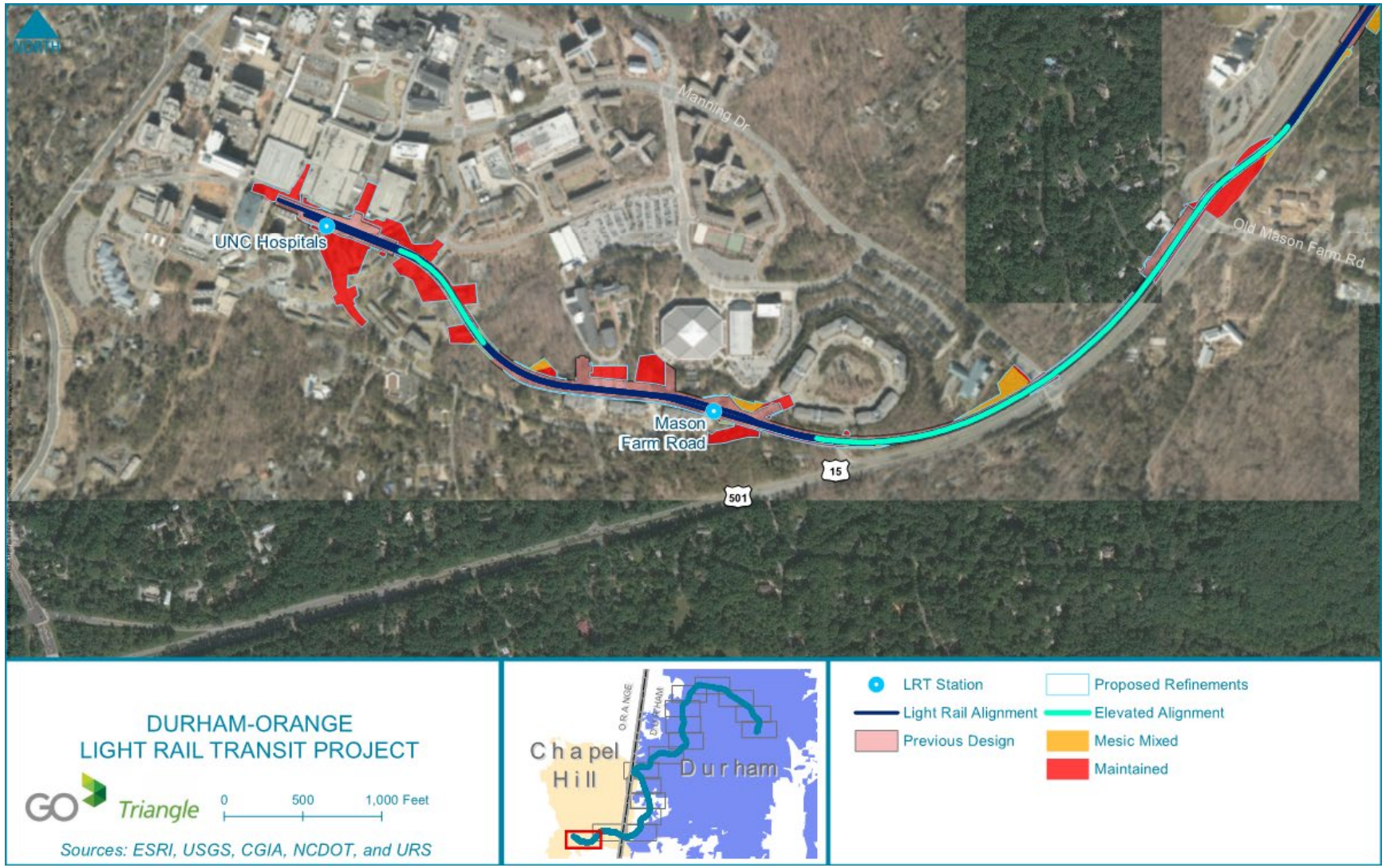


Figure 16: Biotic Communities

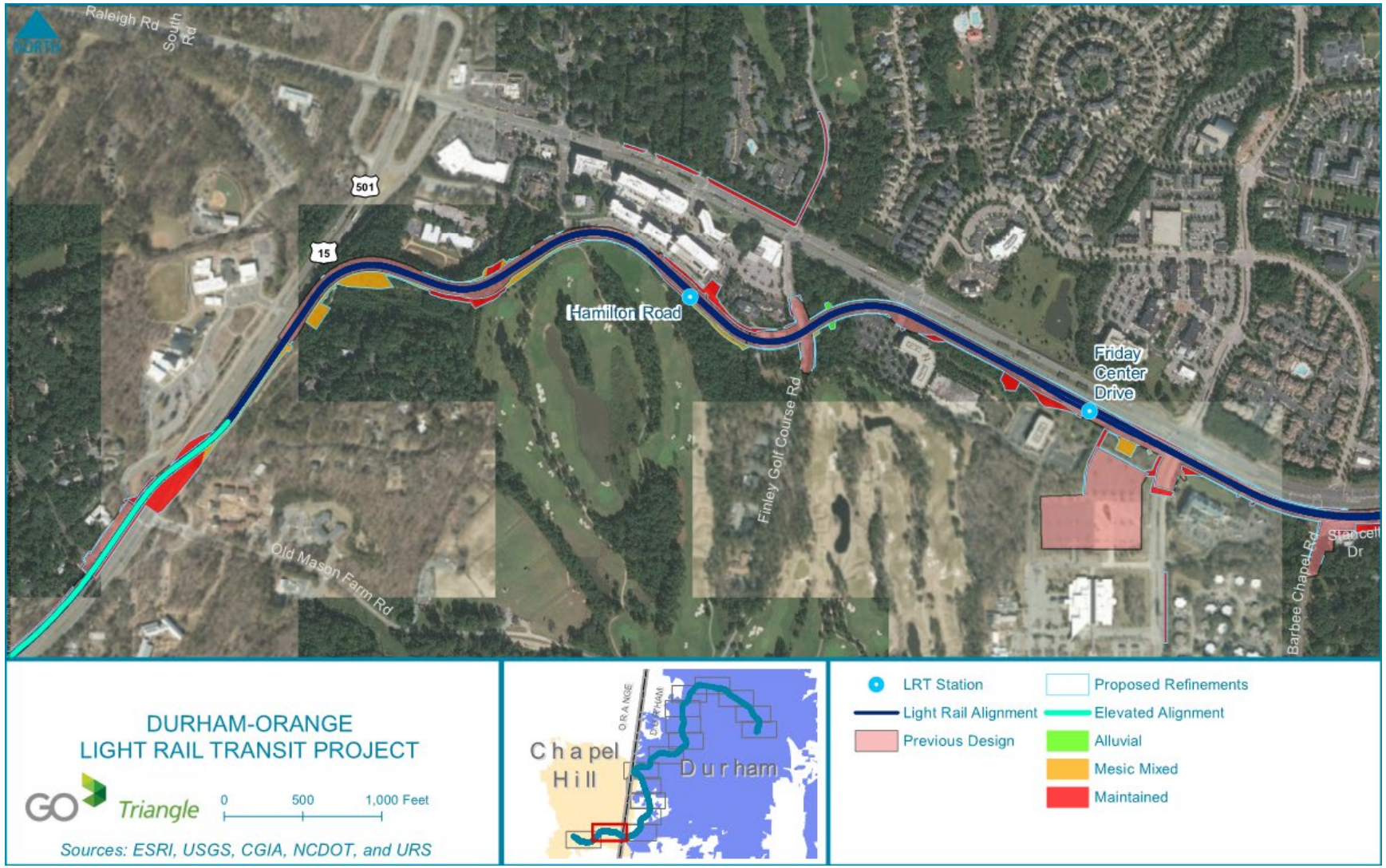


Figure 17: Biotic Communities

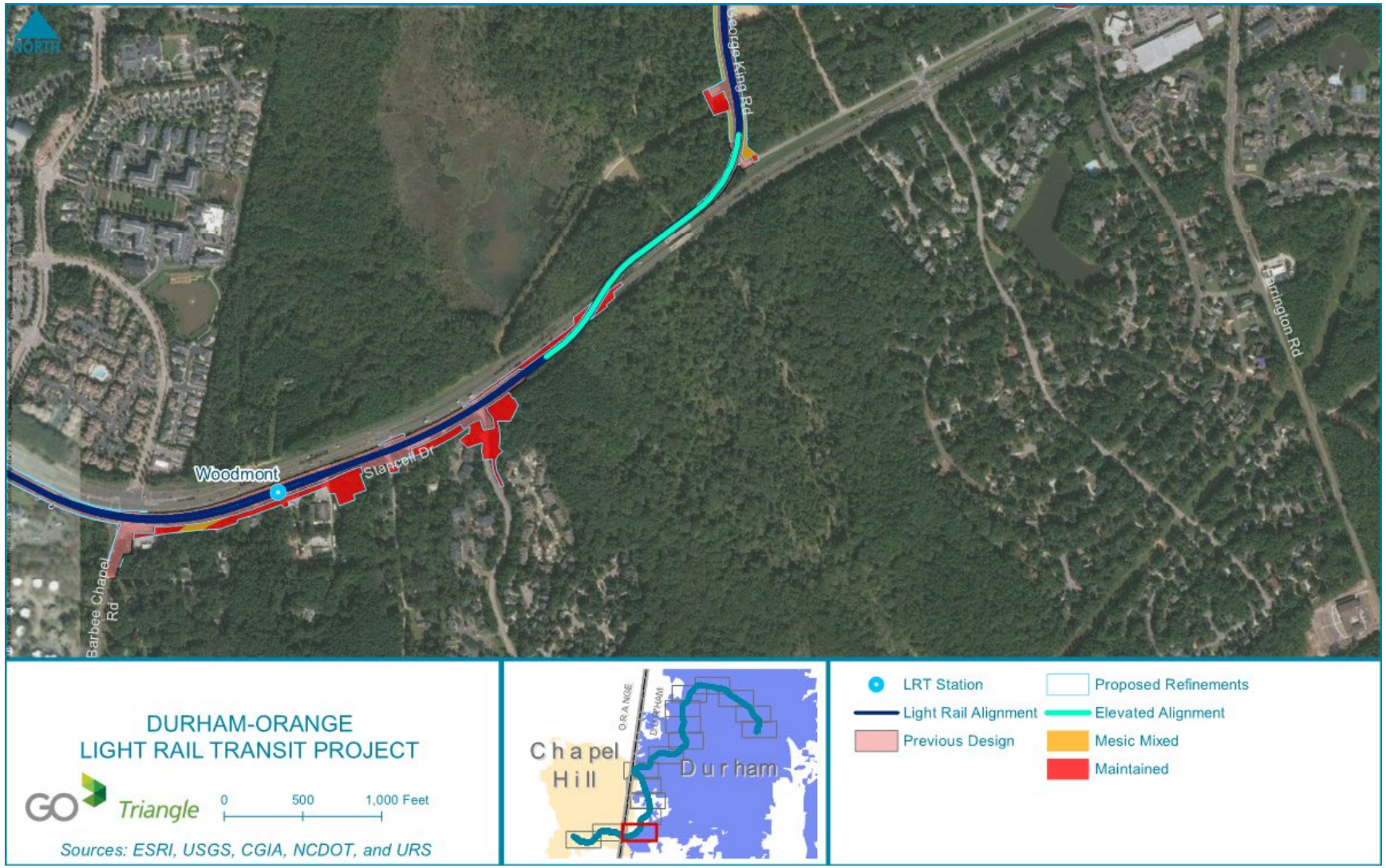
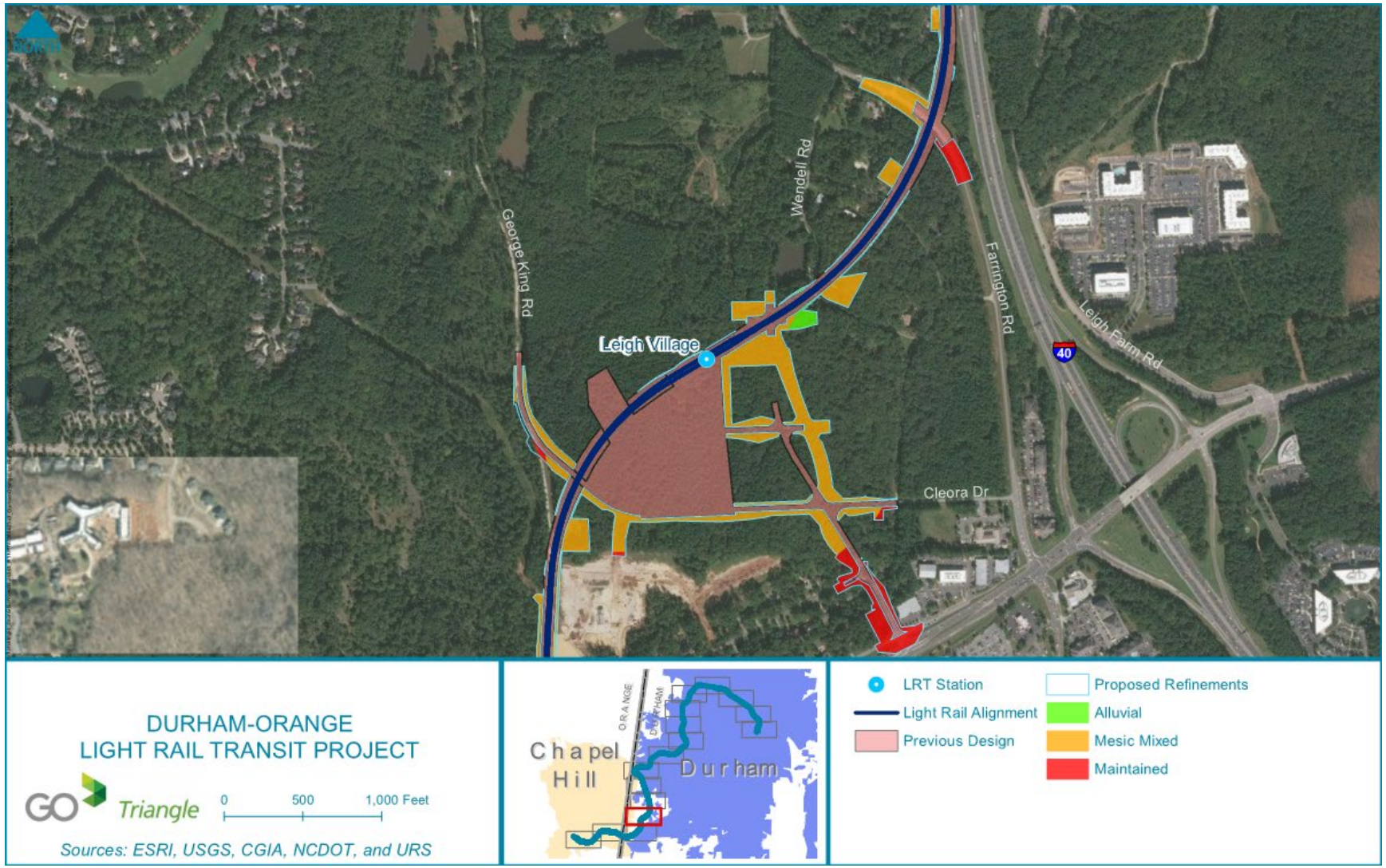


Figure 18: Biotic Communities



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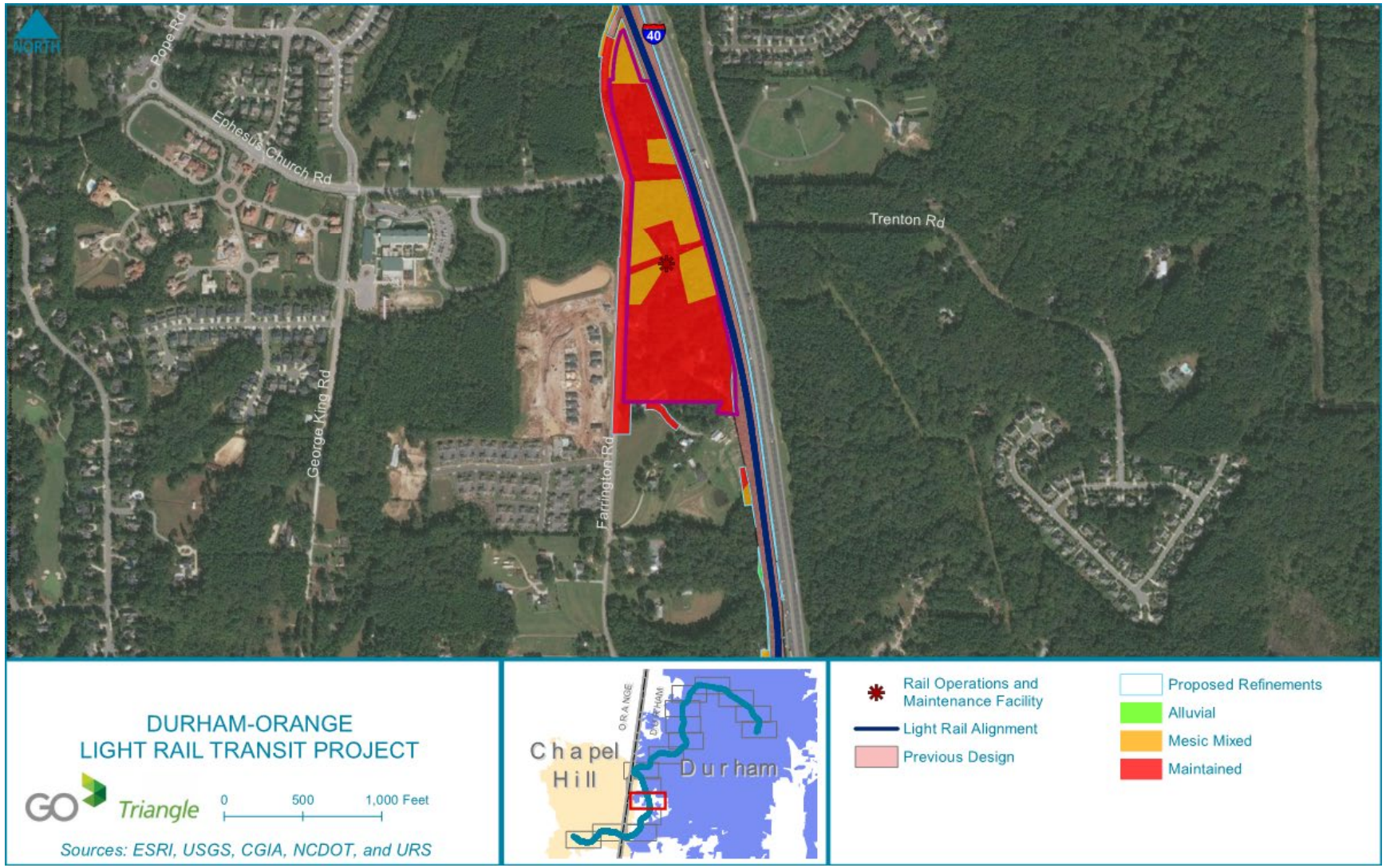

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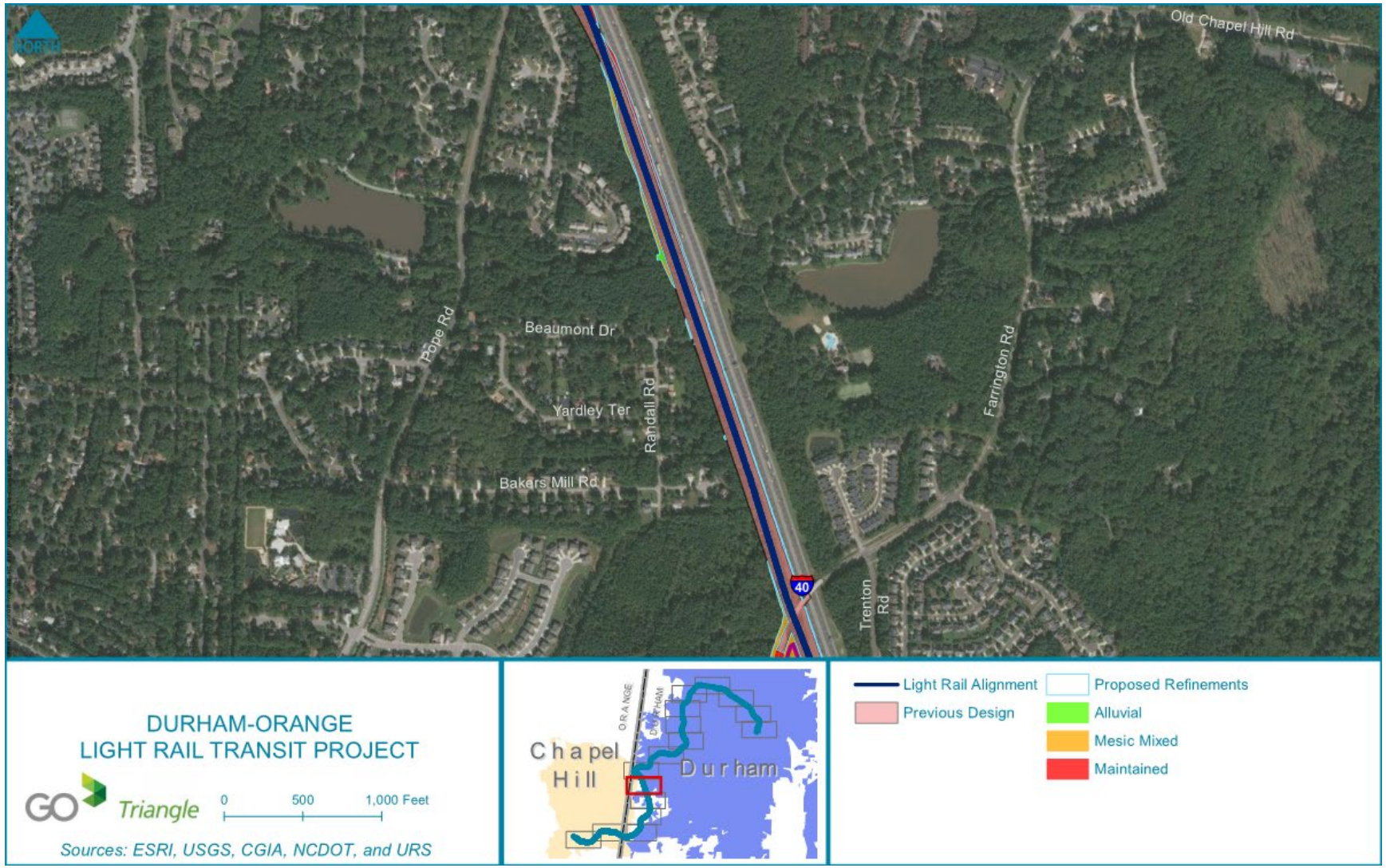
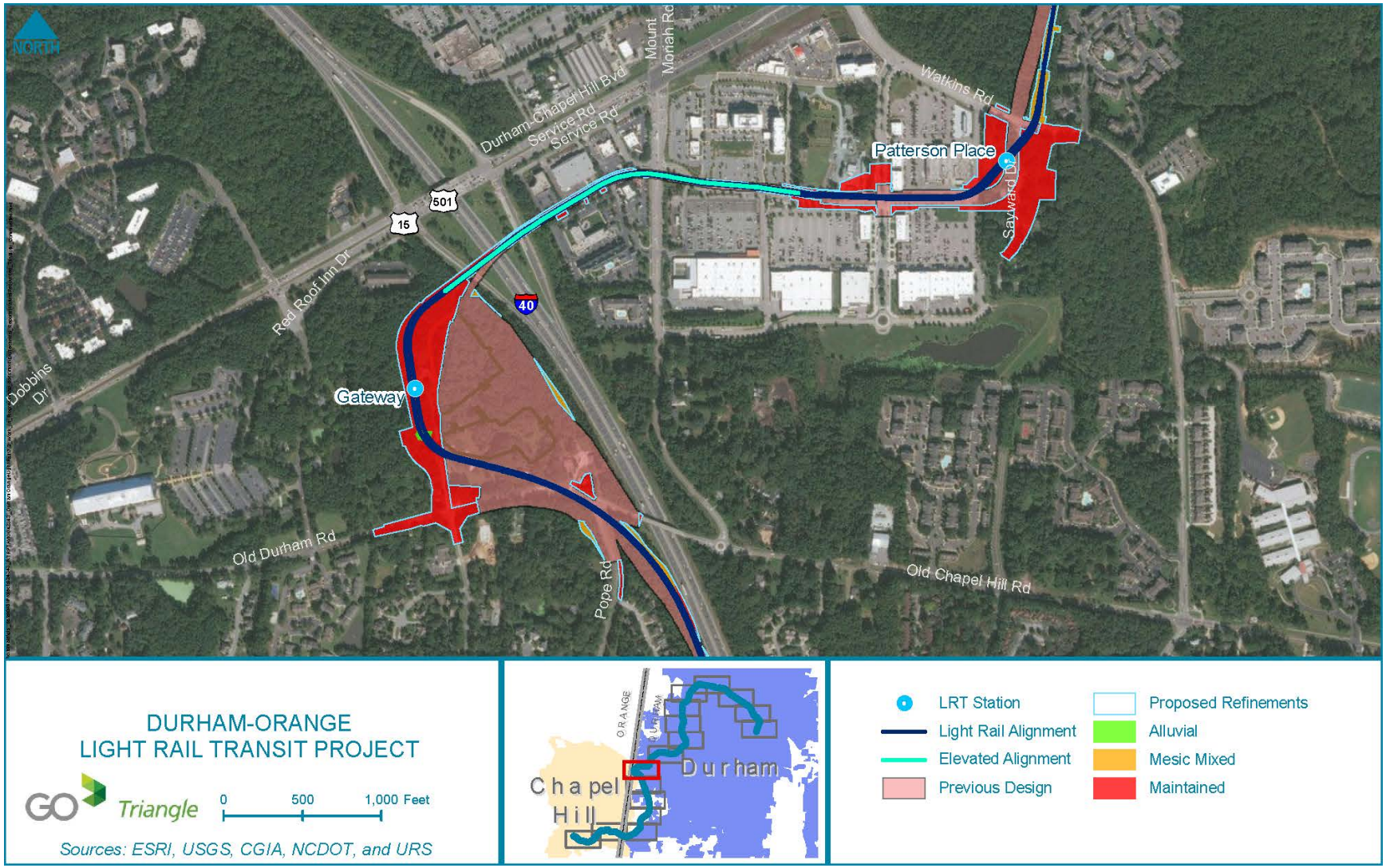


Figure 21: Biotic Communities



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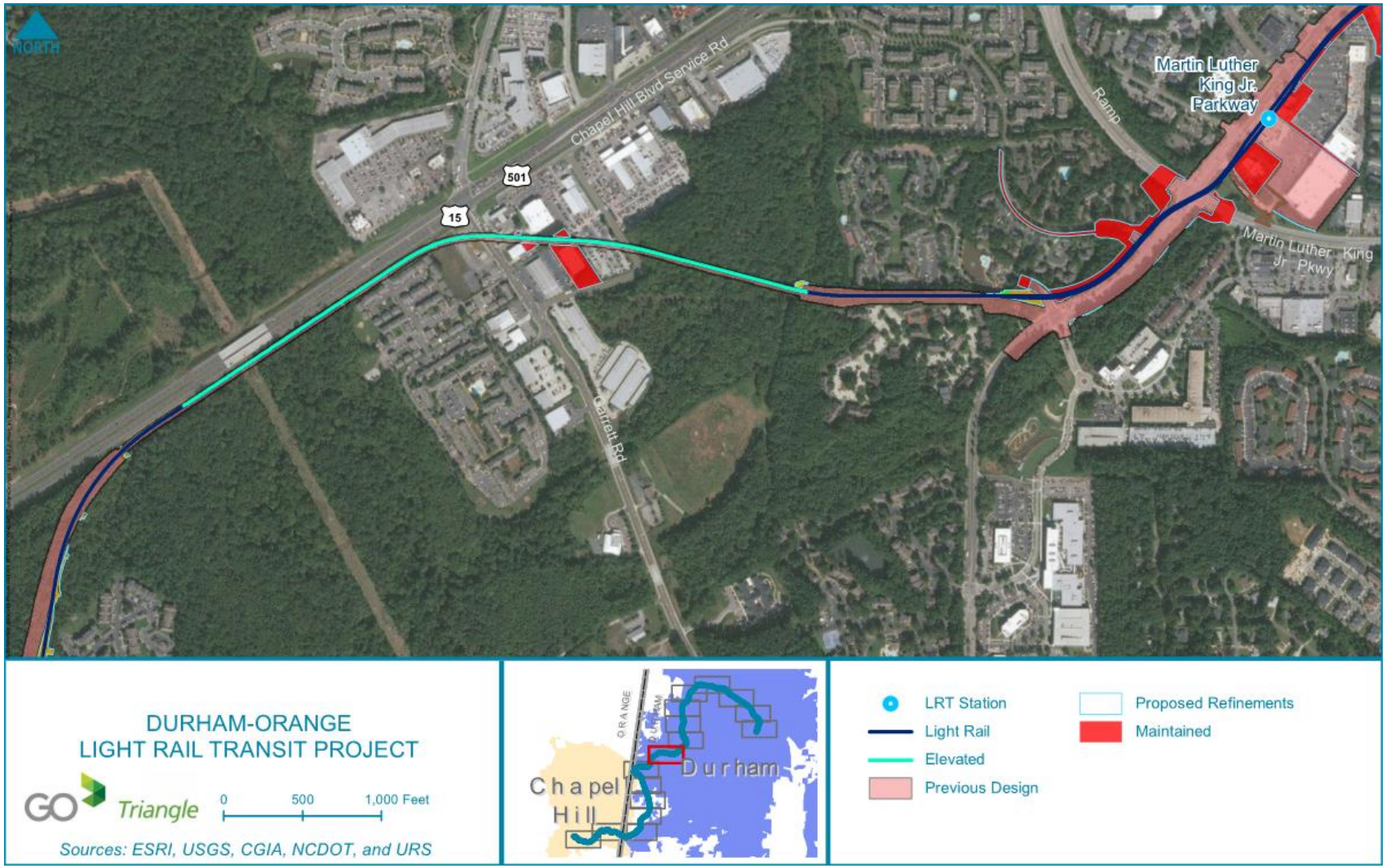

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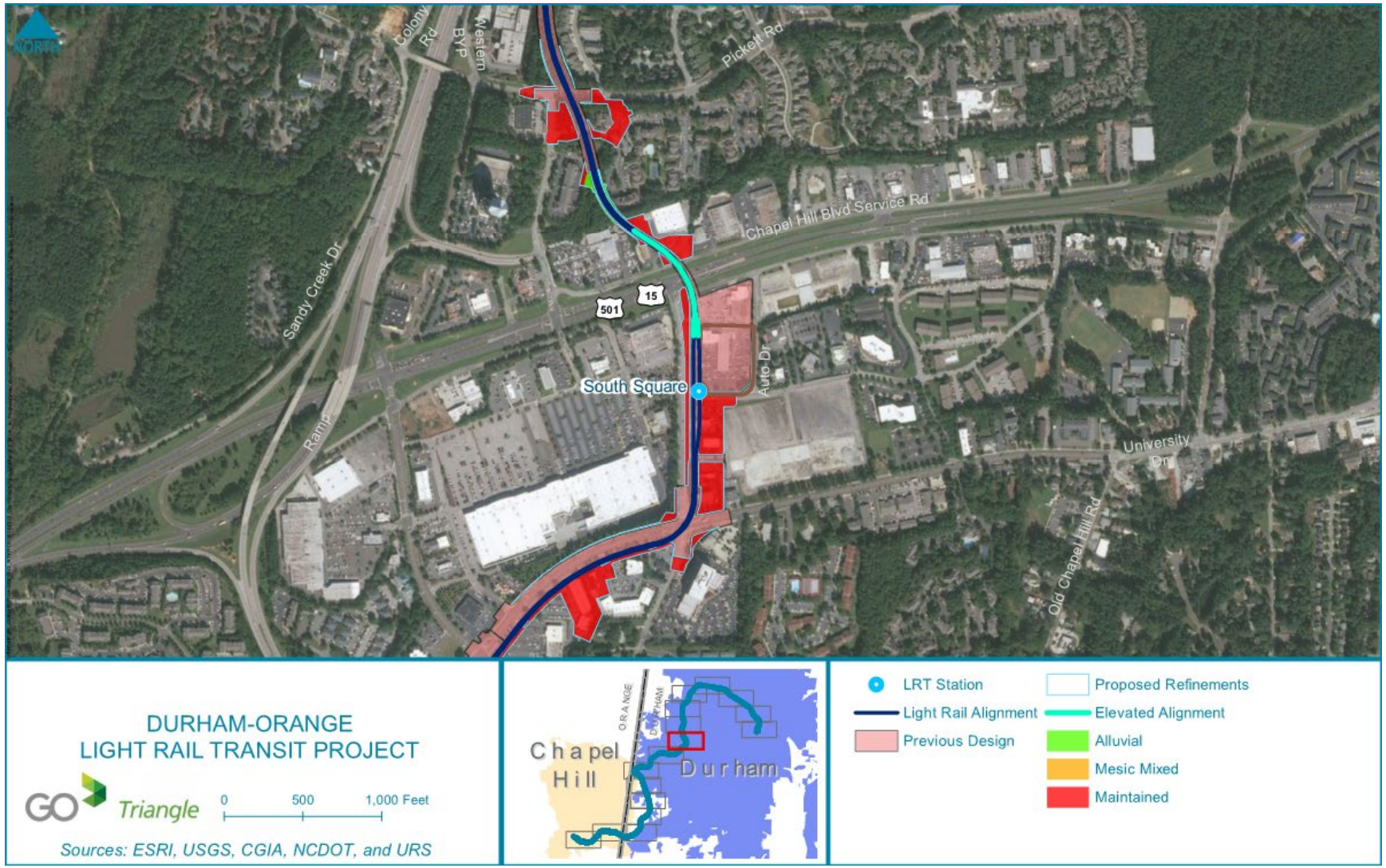

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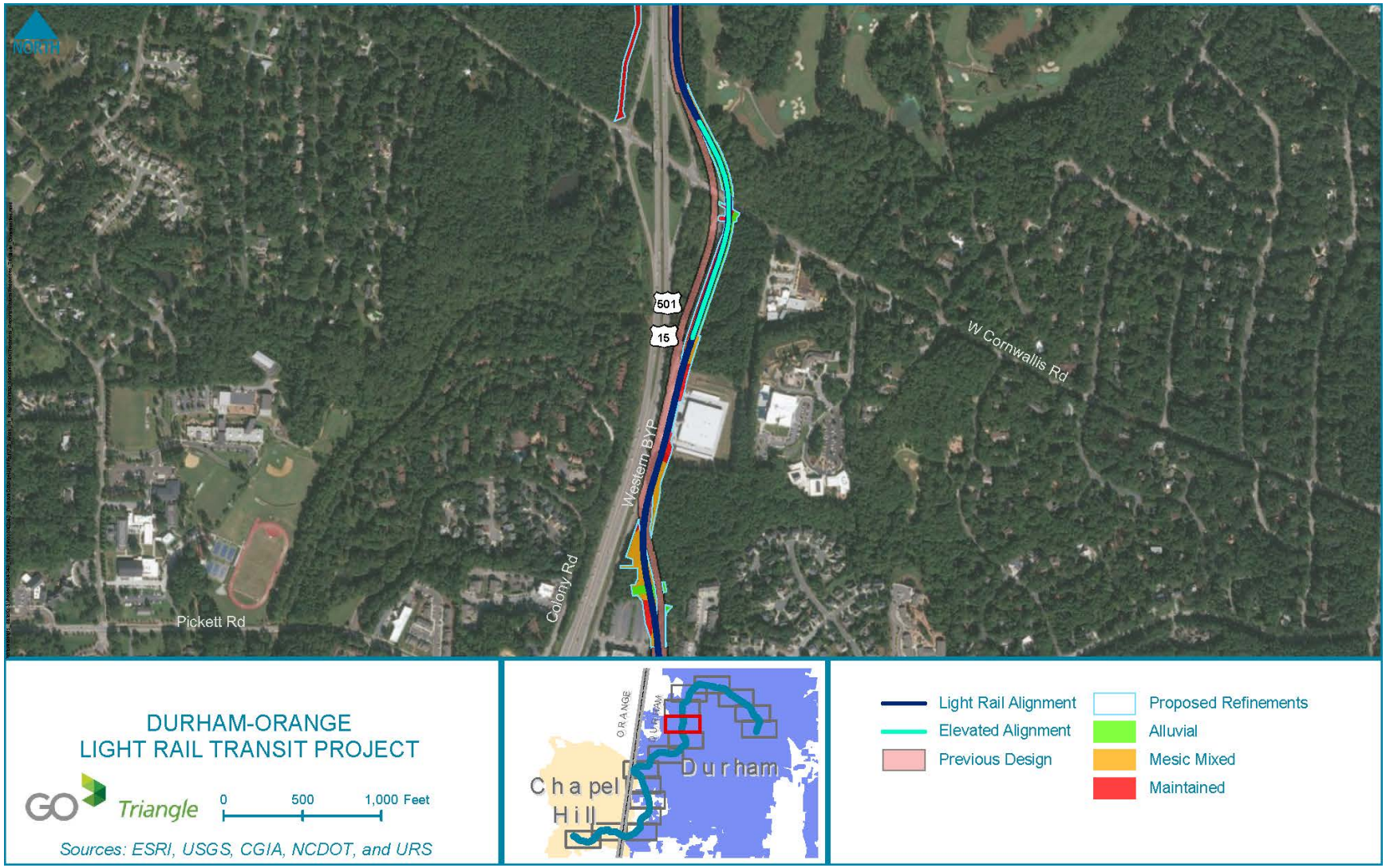

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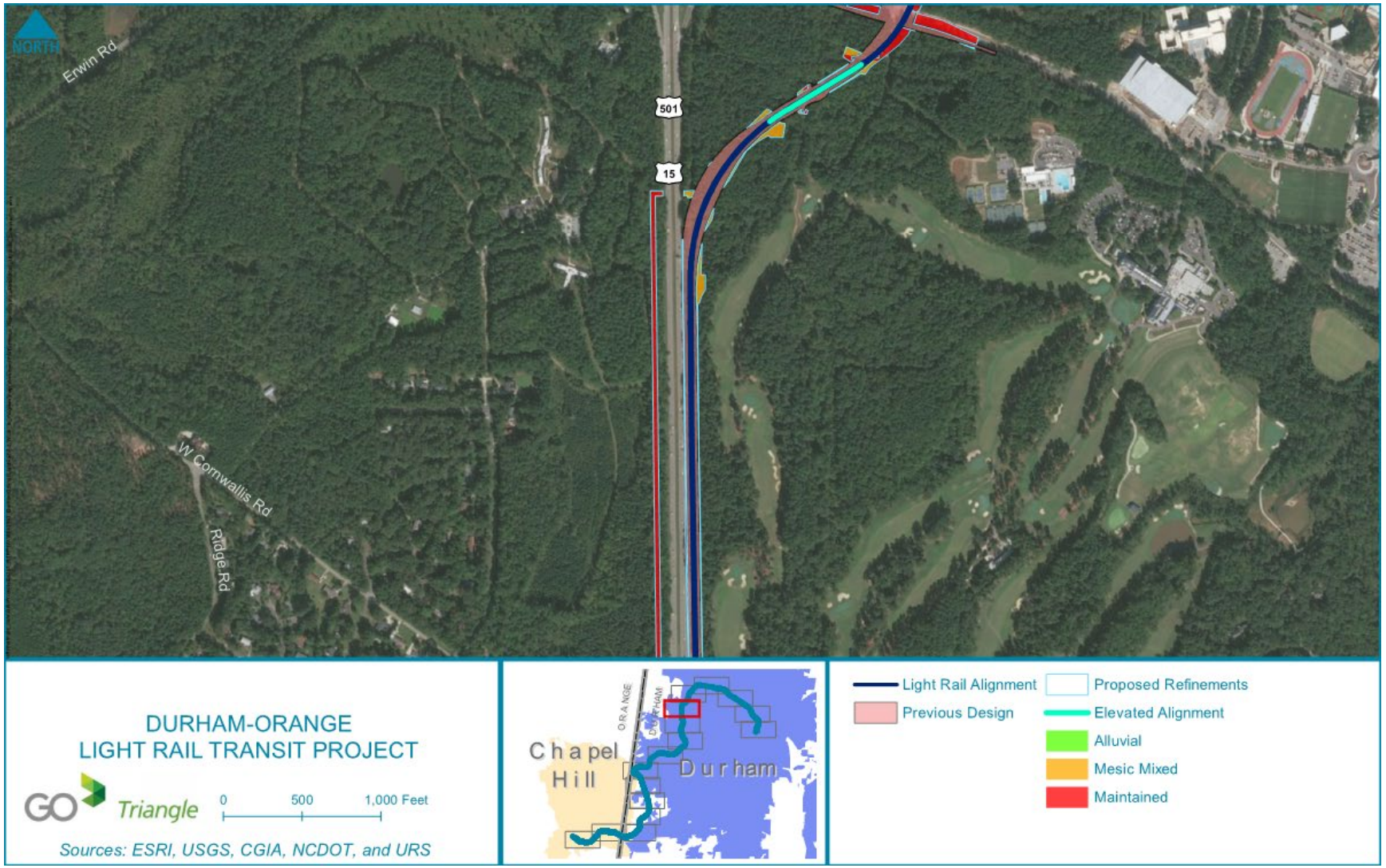

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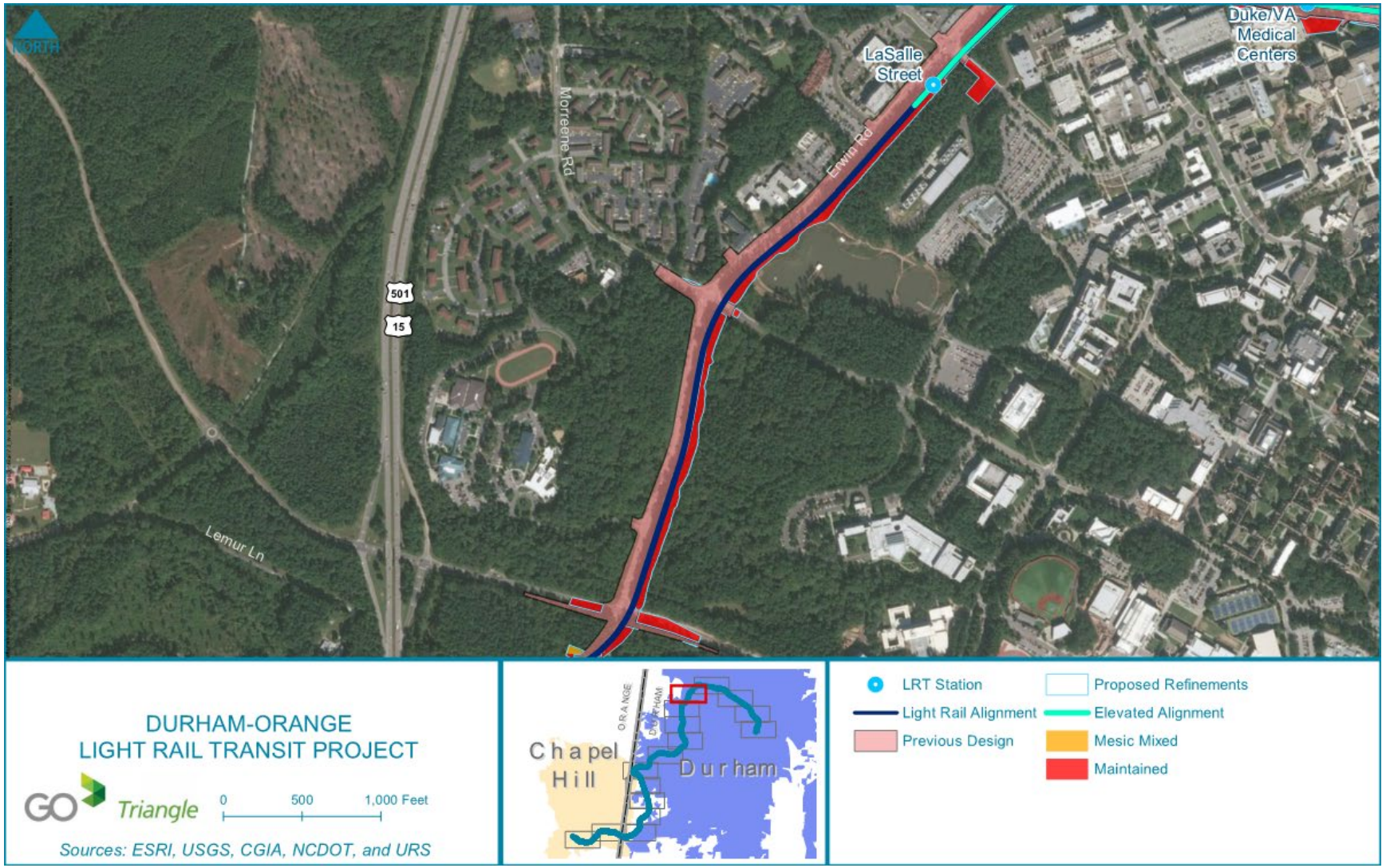


Figure 27: Biotic Communities

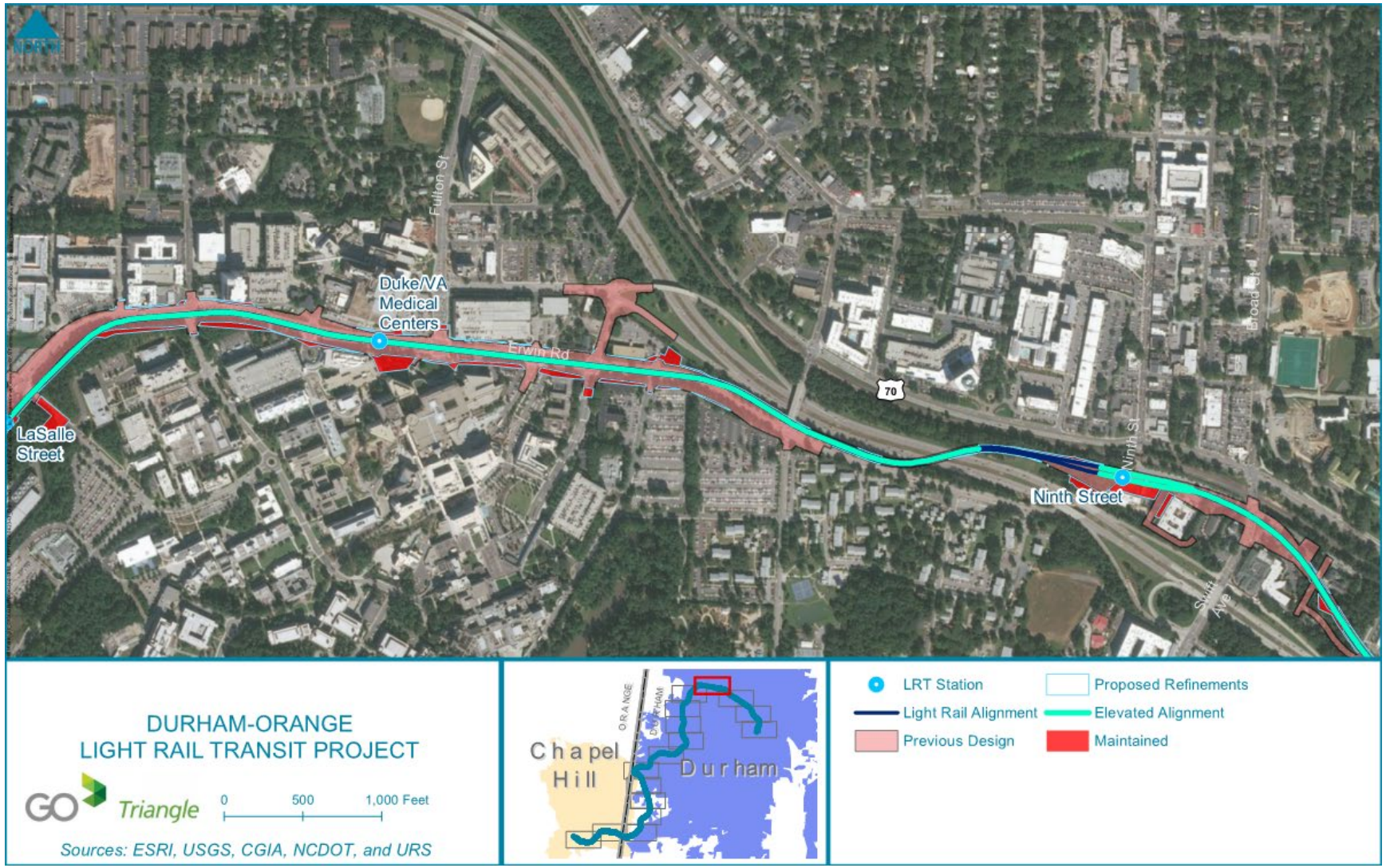
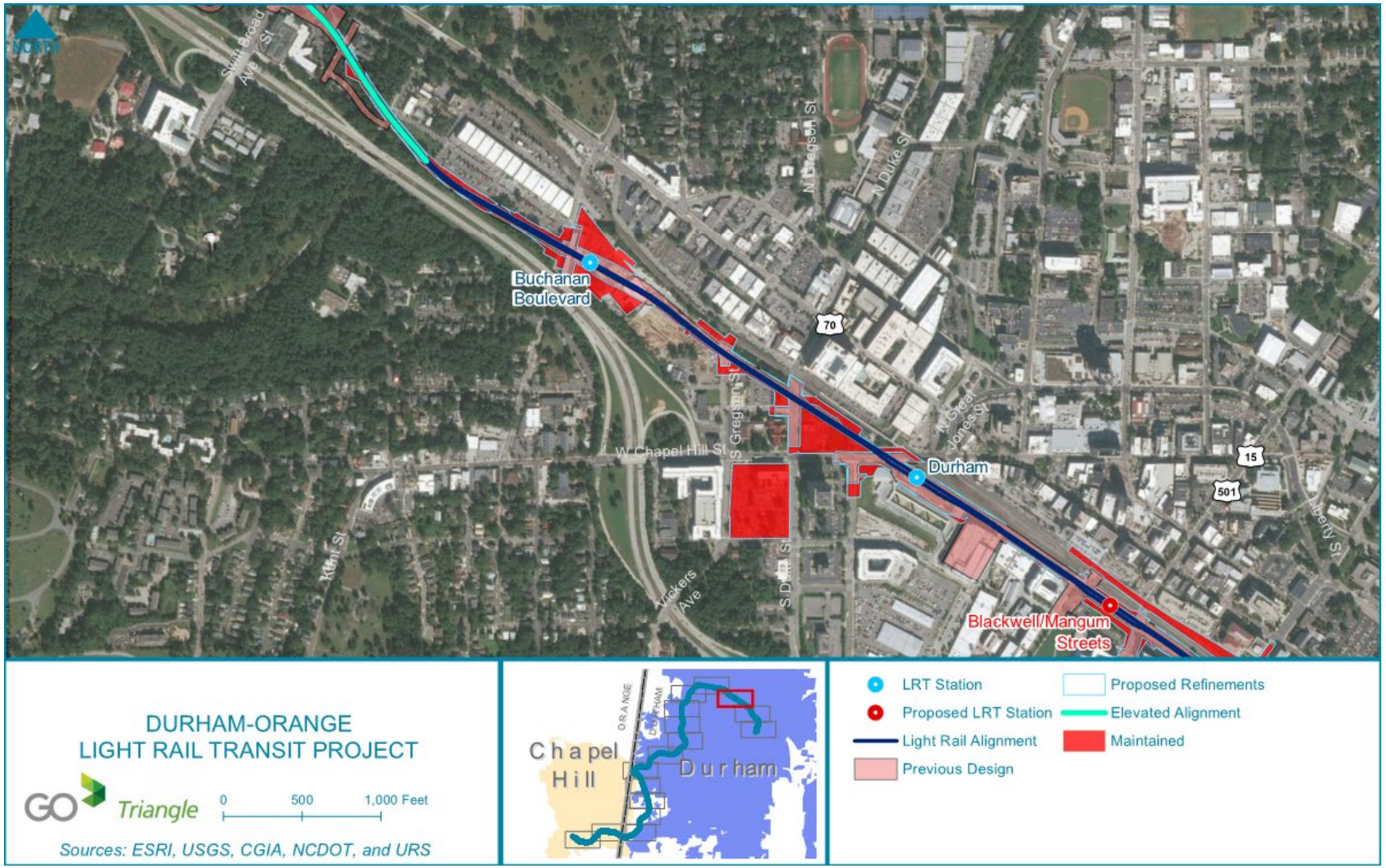


Figure 28: Biotic Communities



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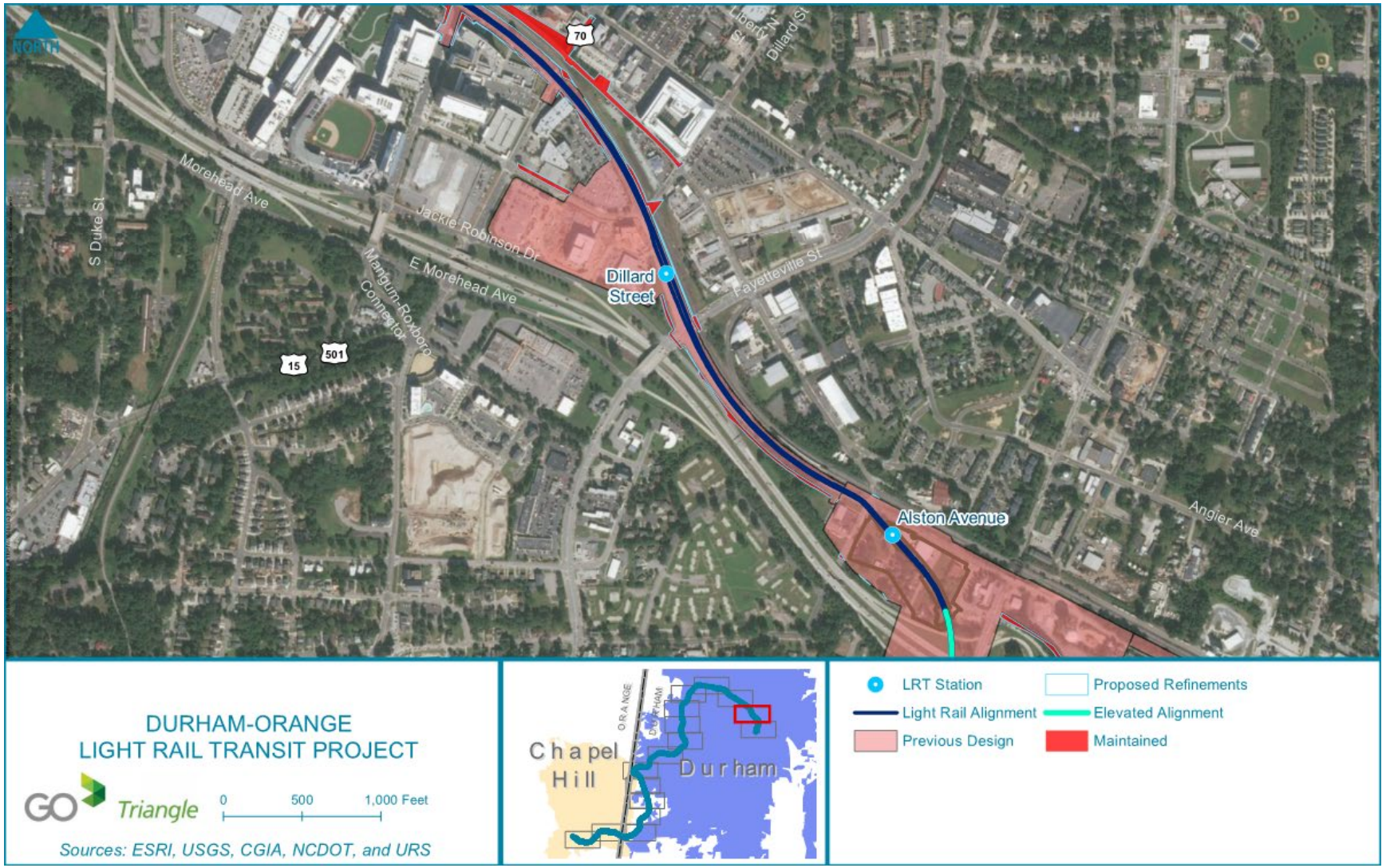

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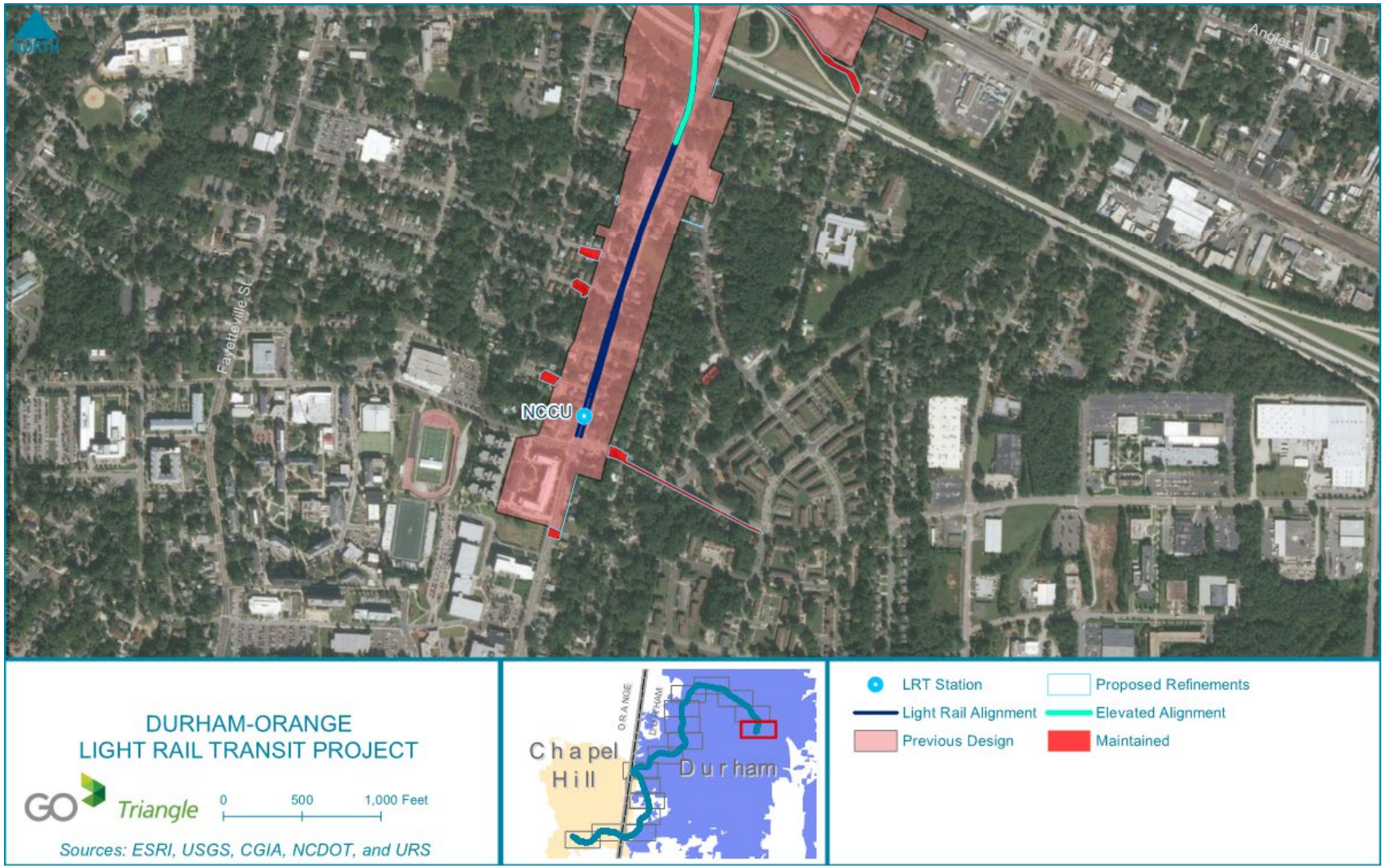

Figure 31: Biotic Communities

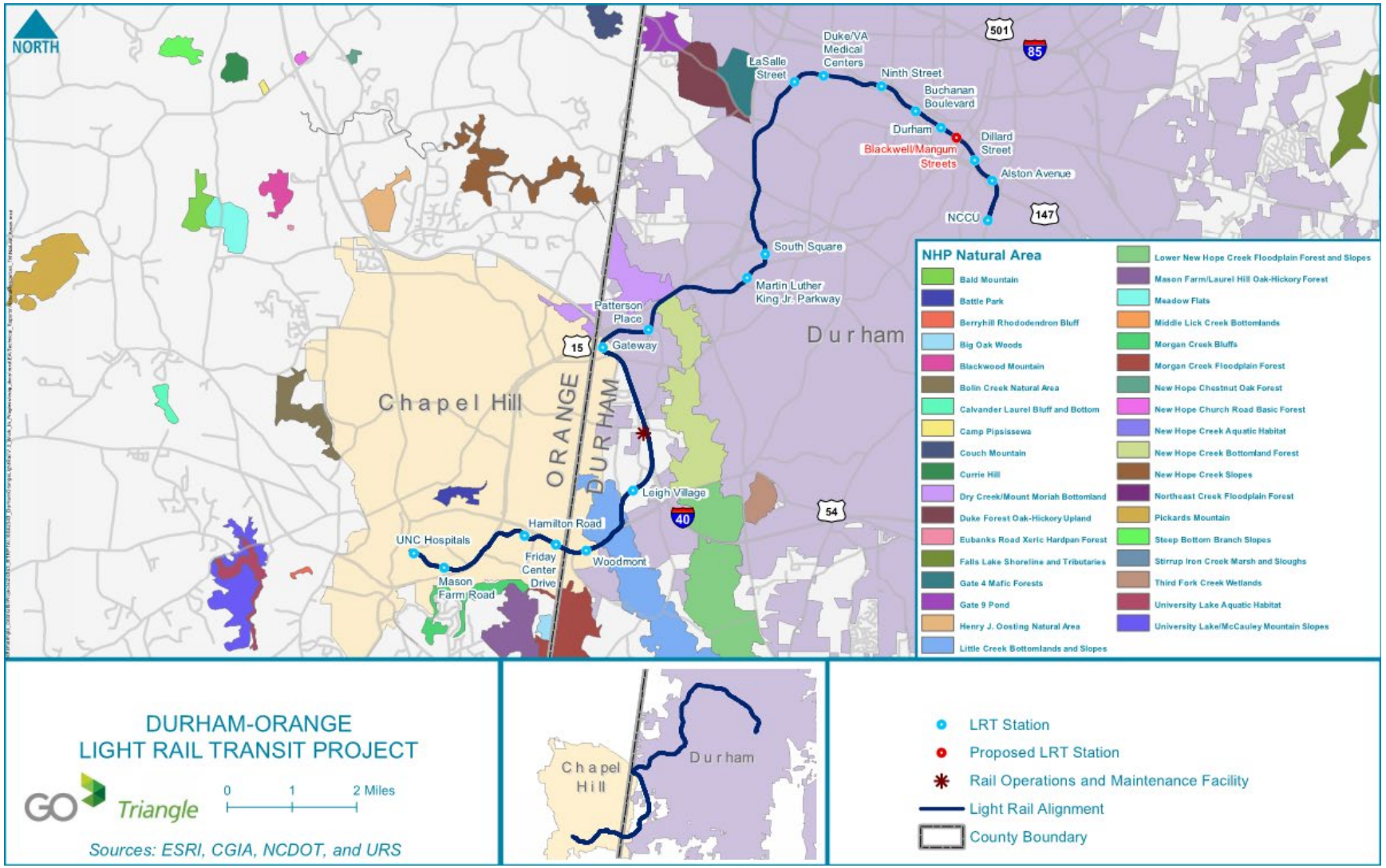

Figure 32: Natural Areas

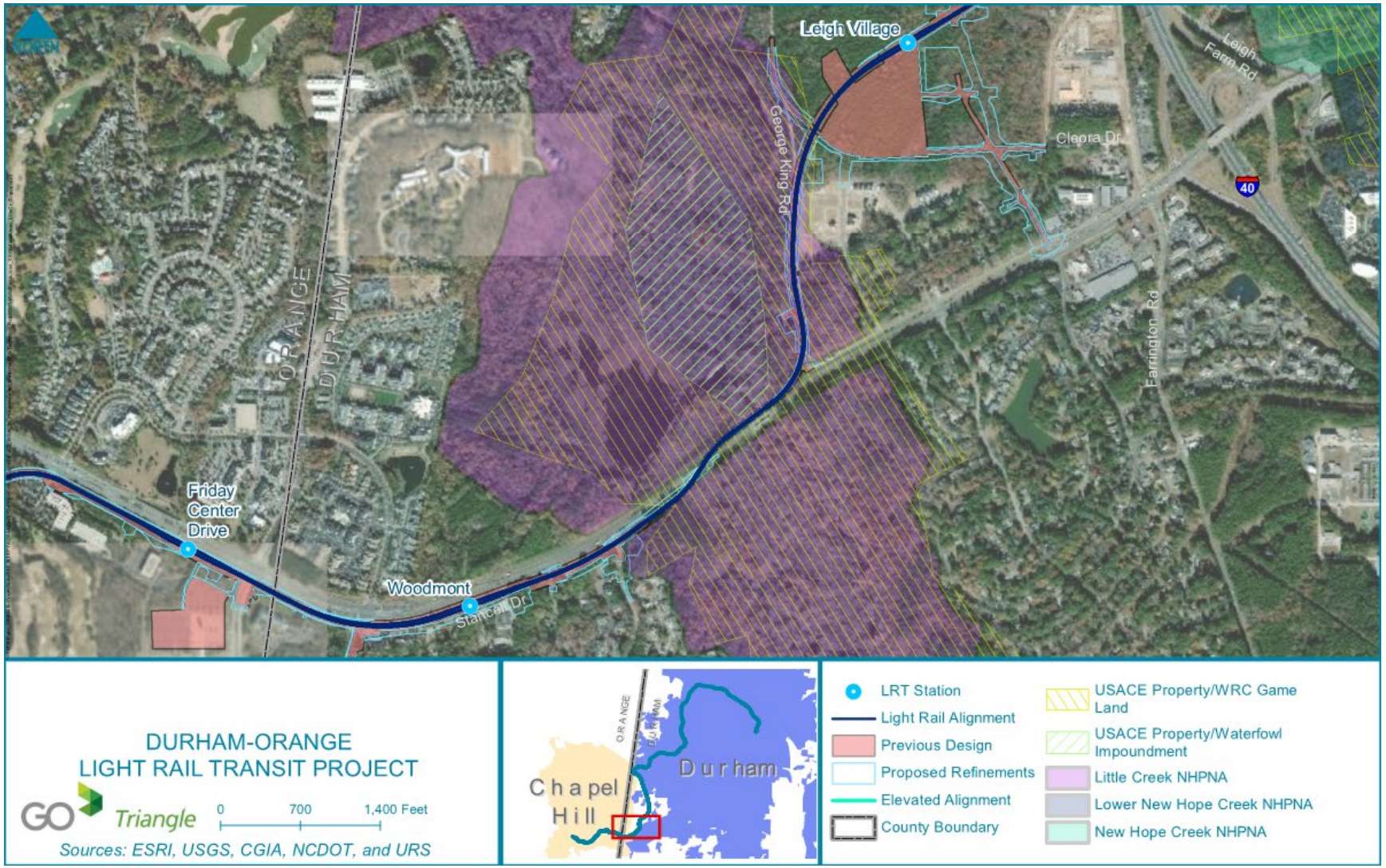

Figure 33: Natural Areas

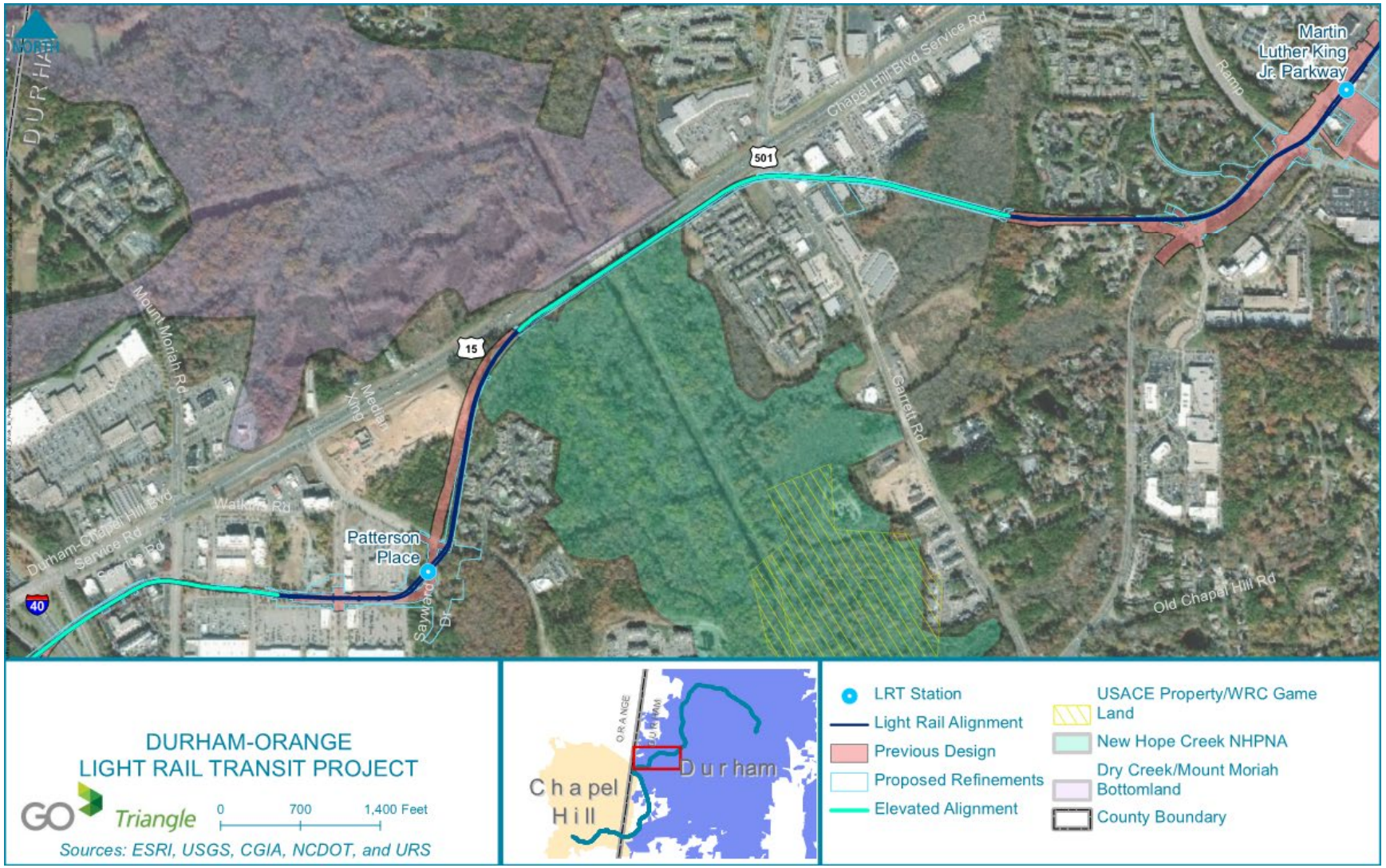

Figure 34: Natural Areas

Attachment G.2: List of Scientific Names

Common Name	Scientific Name
American beech	*Fagus grandifolia*
American bluehearts	*Buchnera Americana*
American elm	*Ulmus americana*
American holly	*Ilex opaca*
American hornbeam	*Carpinus caroliniana*
American sycamore	*Platanus occidentalis*
Asiatic Clam	*Corbicula fluminea*
Autumn olive	*Elaeagnus umbellata*
Bamboo	*Bambuseae* sp.
Beggar ticks	*Bidens* sp.
Big shellbark hickory	*Carya laciniosa*
Black cherry	*Prunus serotina*
Black oak	*Quercus velutina*
Black walnut	*Juglans nigra*
Blackberry	*Rubus fruticosus*
Bloodworm midge	*Chironomidae*
Box Huckleberry	*Gaylussacia brachycera*
Boxelder	*Acer negundo*
Broomsedge	*Andropogon*
Buffalo clover	*Trifolium reflexum*
Bush honeysuckle	*Diervilla* sp.
Caddisfly	*Trichoptera*
Catbrier (saw, whiteleaf)	*Smilax bona-nox, glauca*
Chapman's Redtop	*Tridens chapmanii*
Chinese privet	*Ligustrum sinense*
Christmas fern	*Polystichum acrostichoides*
Common pawpaw	*Asimina triloba*
Crabgrass	*Digitaria sanguinalis*
Crayfish	*Cambarus bartoni*
Dog fennel	*Eupatorium capillifolium*
Douglass's bittercress	*Cardamine douglassii*
Dragonfly	*Odonata*
Duckweed	*Lemna* sp.
Eastern Shiner	*Notropis* sp.
English ivy	*Hedera helix*
False nettle	*Boehmeria*
Fireweed	*Epilobium angustifolium*
Flowering dogwood	*Cornus florida*
Glad bluecurls	*Trichostema brachiatum*
Goldenrod	*Solidago* sp.
Golden shiner	*Notemigonus crysoleucas*
Green ash	*Fraxinus pennsylvanica*
Hackberry	*Celtis occidentalis*
Heartleaf	*Houttuynia cordata*

Common Name	Scientific Name
Hickory	*Carya* sp.
Hoary puccoon	*Lithospermum canescens*
Hophornbeam	*Ostrya virginiana*
Horse nettle	*Solanum carolinense*
Horseweed	*Conyza* sp.
Indian Physic	*Gillenia stipulate*
Ironwood	*Carpinus caroliniana*
Japanese barberry	*Berberis thunbergii*
Japanese grass	*Microstegium vimineum*
Japanese honeysuckle	*Lonicera japonica*
Japanese knotweed	*Fallopia japonica*
Jewelweed	*Impatiens* sp.
Kudzu	*Pueraria montana*
Large-flowered trout lily	*Erythronium americanum*
Lespedeza	*Sericea Lespedeza*
Loblolly pine	*Pinus taeda*
Low Wild-petunia	*Ruellia humilis*
Maple-leaf viburnum	*Viburnum acerifolium*
Mayfly	*Ephemeroptera*
Michaux's sumac	*Rhus michauxii*
Mimosa	*Albizia julibrissin*
Mockernut hickory	*Carya tomentosa*
Mosquito	*Diptera*
Mosquitofish	*Gambusia holbrooki*
Multiflora rose	*Rosa multiflora*
Muscadine	*Vitis rotundifolia*
Narrow-leaf Aster	*Symphyotrichum leave*
Northern red oak	*Quercus rubra*
Oriental bittersweet	*Celastrus orbiculatus*
Pink Thoroughwort	*Fleischmannia incarnate*
Pondberry	*Lindera melissifolia*
Poison ivy	*Toxicodendron radicans*
Prairie blue wild indigo	*Baptisia australis*
Princesstree	*Paulownia tomentosa*
Purple fringeless orchid	*Platanthera peramoena*
Queen Anne’s lace	*Daucus carota*
Ragweed	*Ambrosia* sp.
Red maple	*Acer rubrum*
River birch	*Betula nigra*
Sedges	*Cyperaceae* sp.
Shagbark hickory	*Carya ovata*
Shale-barren skullcap	*Scutellaria leonardii*
Shiner	*Cyprinella* sp.
Shooting star	*Primula meadia*
Silky dogwood	*Cornus amomum*
Slippery elm	*Ulmus rubra*
Smartweed	*Polygonum* sp.
Smooth coneflower	*Echinacea laevigata*

Common Name	Scientific Name
Snail	*Planorbidae*
Soft rush	*Juncus effuses*
Sourwood	*Oxydendrum arboreum*
Southern anemone	*Anemone berlandieri*
Southern red oak	*Quercus falcata*
Southern rein orchids	*Habenaria flava*
Southern skullcap	*Scutellaria australis*
Spicebush	*Lindera benzoin*
Stonefly	*Plecoptera*
Sugar maple	*Acer saccharum*
Sunfish	*Lepomis* sp.
Swamp chestnut oak	*Quercus michauxii*
Swamp white oak	*Quercus bicolor*
Sweetgum	*Liquidambar styraciflua*
Tall Larkspur	*Delphinium exaltatum*
Tree-of-heaven	*Ailanthus altissima*
Trumpet creeper	*Campsis radicans*
Tulip poplar	*Liriodendron tulipifera*
Veined skullcap	*Scutellaria nervosa*
Virginia pine	*Pinus virginiana*
Water boatman	*Corixidae*
Watercress	*Nasturtium officinale*
Water strider	*Gerridae*
Wax myrtle	*Morella cerifera*
White ash	*Fraxinus americana*
White oak	*Quercus alba*
Willow oak	*Quercus phellos*
Winged sumac	*Rhus copallinum*
Wiry panic grass	*Panicum flexile*
Yellow lady's slipper	*Cypripedium parviflorum*

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Attachment G.3: The Durham County Inventory of Important Natural Areas, Plants, and Wildlife

Please see Appendix K21 of the DEIS for this information.

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Attachment G.4: Qualifications of Contributors

Contributor: Nicolas Frederick
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Experience: Environmental Scientist, HDR, 2010 to Present.
Responsibilities: Author, data collection

Contributor: John Jamison
Education: B.S. Natural Resources
Experience: Environmental Scientist, HDR, 2004 to 2018.
Environmental Scientist, AMEC 1999 to 2004
Project Environmental Scientist, MACTEC 1999 to 2004
Responsibilities: Peer Review, data collection

Contributor: Jennifer Curran
Education: M.S. Marine Environmental Sciences, B.S. Environmental Science
Experience: Senior Environmental and Regulatory Technical Leader, HDR, 2017 to Present.
New Jersey Rivers Program Manager, Nature Conservancy 2015 to 2016
Environmental Sciences Section Manager, HDR, 2000 to 2015
Responsibilities: Peer Review

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