



TRANSPORTATION IMPACT ANALYSIS CAROLINA NORTH DEVELOPMENT

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Introduction

- An updated Transportation Impact Analysis is being finalized by VHB on behalf of the Town:
 - The first TIA was originally completed on June 3, 2009 (Spring 2009 TIA)
 - New traffic, transit, pedestrian and bicycle data was collected during September and October of 2009
 - The Phase 2 horizon year was adjusted from 2025 to 2030
 - Using the new count data and horizon year change, a new TIA (Fall 2009 TIA) has been prepared to serve as an update to the original TIA
 - This updated TIA will be finalized after this review period
- Updated Draft TIA Executive Summary is available on the Town website



Introduction

- Issues addressed by the study that have NOT changed between the Spring 2009 TIA and Fall 2009 TIA:
 - Study area intersections
 - Phase 1 horizon year (2015)
 - Growth rates used to project future traffic volumes
 - Approved development traffic and committed improvements
 - Carolina North development program
 - Trip generation, mode split, and trip distribution
 - Crash history near Carolina North



Introduction

- Issues addressed by the study that have changed between the Spring 2009 TIA and Fall 2009 TIA:
 - Existing traffic, transit, pedestrian and bicycle counts
 - Phase 2 horizon year (2030)
 - Future conditions assessment (with and without the project)
 - Focus on multi-modal impacts of the development in the vicinity of the site
 - Potential mitigation measures for traffic, transit, pedestrians and bicycles



TRANSPORTATION IMPACT ANALYSIS (TIA) CAROLINA NORTH DEVELOPMENT

TIA DEVELOPMENT PLAN

Land Use	Short-Term Development (2015*)	Additional Long-Term Development	Total TIA Development (2030*)
Academic	410,000	870,000	1,280,000
Private**	180,000	520,000	700,000
Civic/Retail	10,000	60,000	70,000
Housing***	200,000	550,000	750,000
Health Care	0	200,000	200,000
Total	800,000	2,200,000	3,000,000

* Horizon years were selected to test impacts and are not predictions of specific development levels for these two years

** Includes Innovation Center approved at 85,000 sf

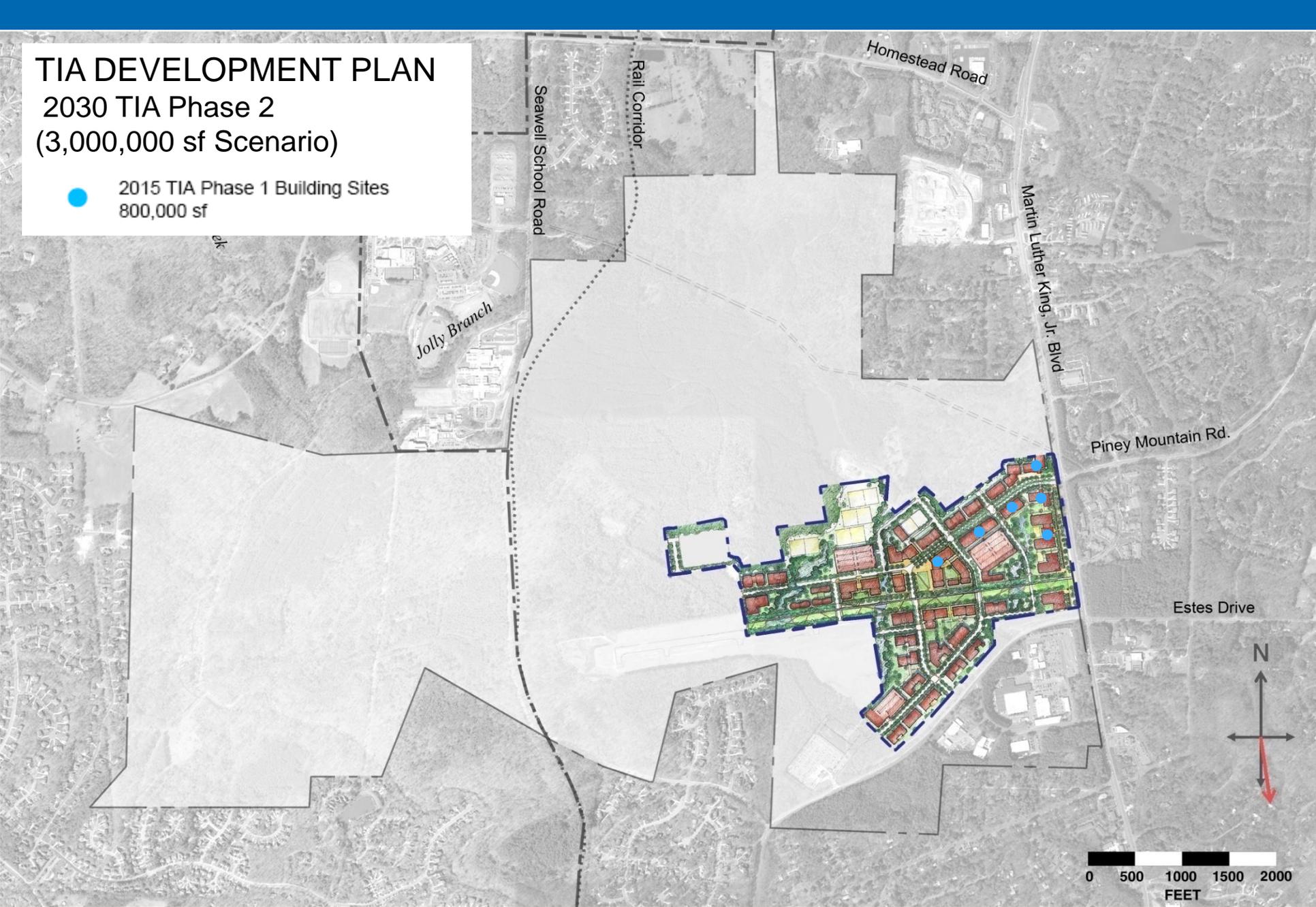
*** 1,000 gsf/unit results in 200 units for Short-Term and 750 total housing units

TIA DEVELOPMENT PLAN

2030 TIA Phase 2

(3,000,000 sf Scenario)

 2015 TIA Phase 1 Building Sites
800,000 sf





2009 Scenario

- 52 Intersections

2015 Scenario

- 18 Intersections

2030 Scenario

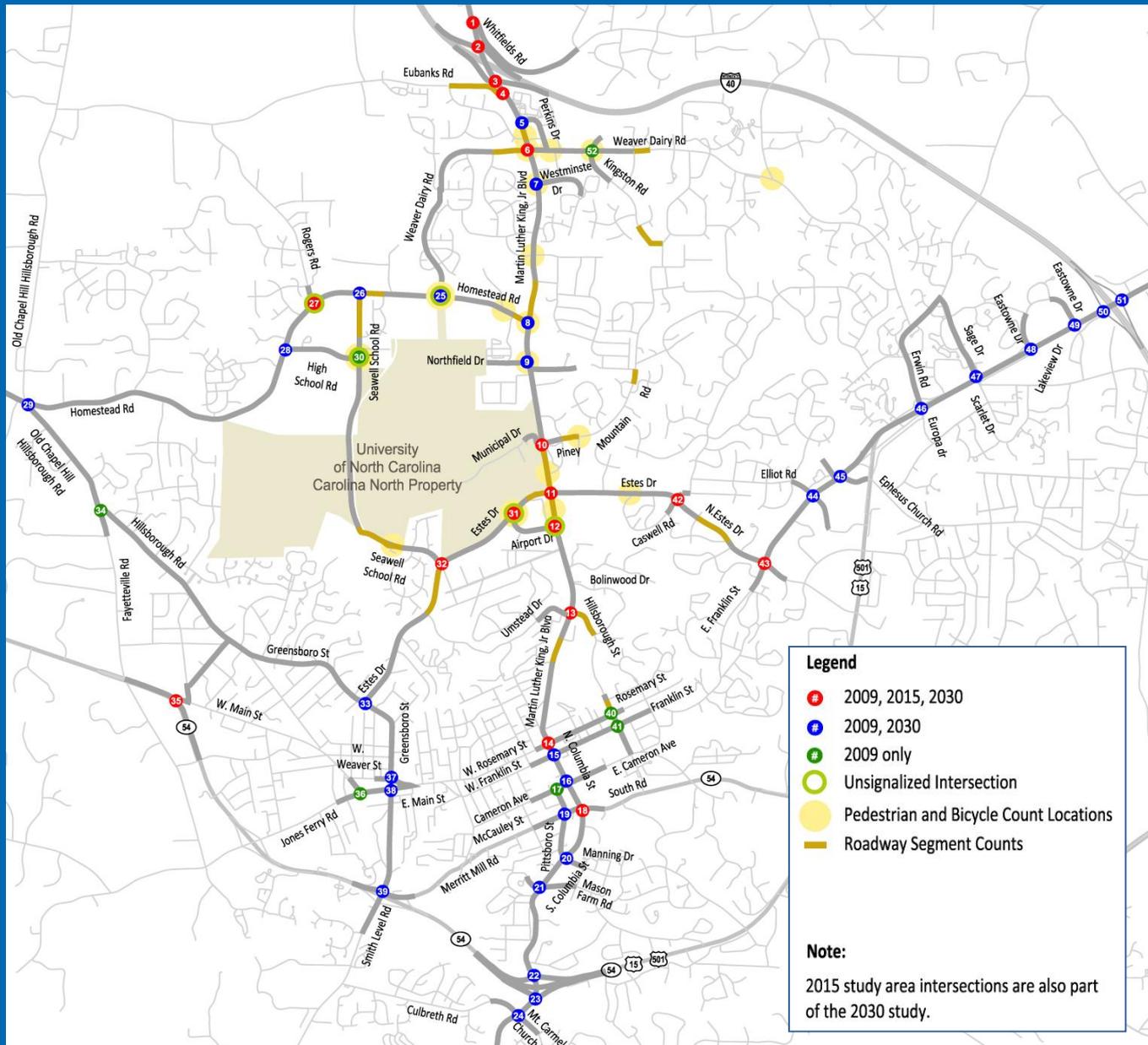
- 46 Intersections

Pedestrian and Bicycle Counts

- 18 Locations

Roadway Segment Counts

- 21 Locations





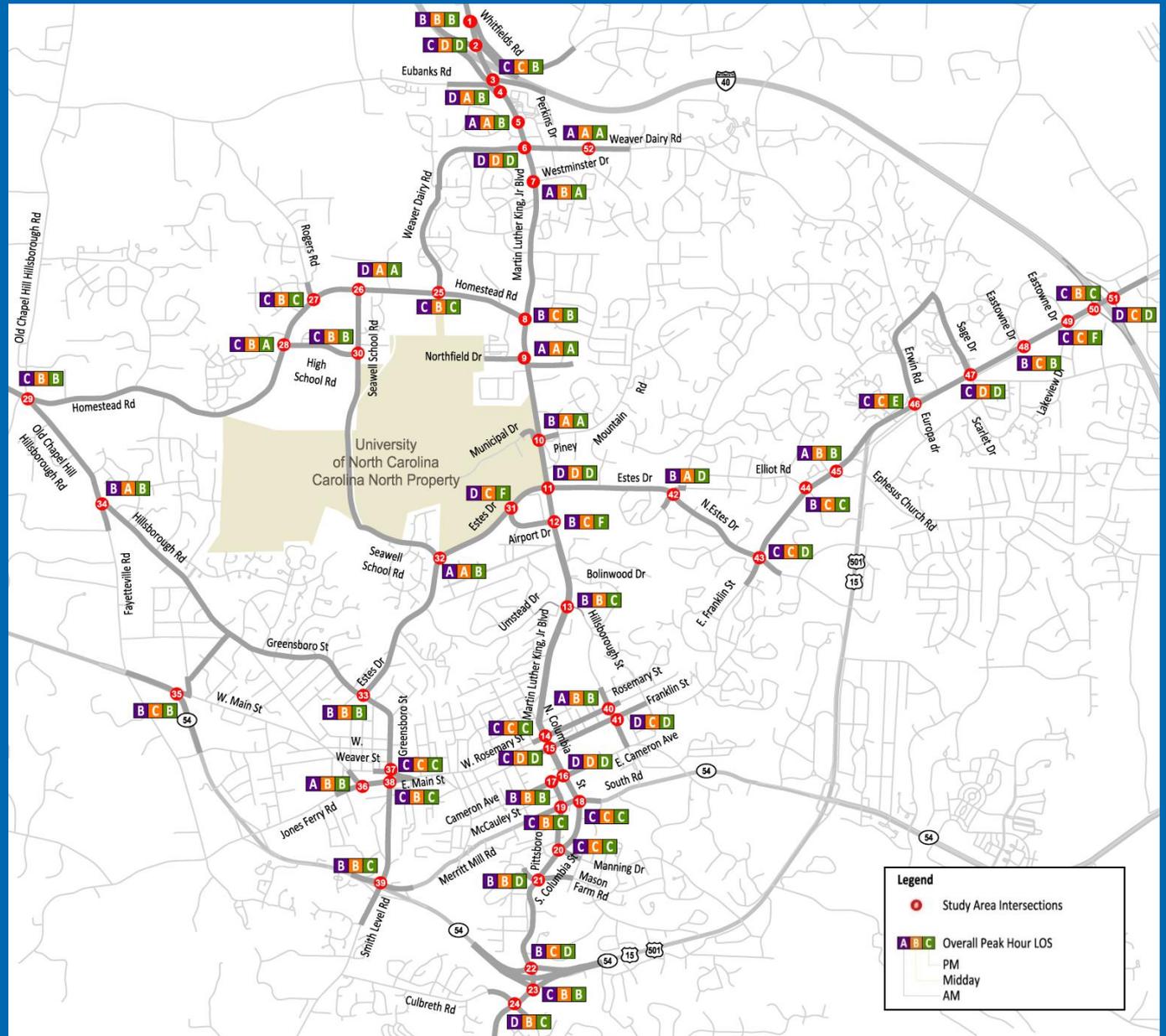
Traffic Volume Comparison

Roadway Section	Spring 2009 ADT	Fall 2009 ADT	% Change
Martin Luther King, Jr. Blvd (NC 86) between Clyde Rd and Hilltop MHP	7606	7070	-7.05%
Eubanks Rd between Northwood Dr and Martin Luther King, Jr. Blvd (NC 86)	7960	7495	-5.84%
Martin Luther King, Jr. Blvd (NC 86) between Perkins Dr and Northwood Dr	30280	23361	-22.85%
Weaver Dairy Rd Ext between Lonebrook and Martin Luther King, Jr. Blvd (NC 86)	5290	4836	-8.58%
Weaver Dairy Rd between Timberlyne Rd and Weatherstone Dr	11291	10178	-9.86%
Seawell School Rd between Homestead Rd and Savannah Terrace	4581	4121	-10.04%
Homestead Rd between Brookstone Dr and Martin Luther King, Jr. Blvd (NC 86)	8944	9669	8.11%
Martin Luther King, Jr. Blvd (NC 86) between Dixie Ln and Homestead Rd	26564	24689	-7.06%
Seawell School Rd between Hanover Place and Railroad Xing 0.1 mi to the West	4974	3527	-29.09%
Estes Dr Ext between Seawell School Rd and Umstead Rd	13662	12609	-7.71%
N. Estes Dr between Martin Luther King, Jr. Blvd (NC 86) and UNC Facilities Dept. Driveway to the west	17171	11806	-31.24%
Martin Luther King, Jr. Blvd (NC 86) between N. Estes Dr and YMCA Driveway to the south	21843	21699	-0.66%
N. Estes Dr between Halifax Rd and Granville Rd	15567	14148	-9.12%
Martin Luther King, Jr. Blvd (NC 86) between Bolin Heights and E. Longview St	17916	19222	7.29%
Hillsborough St between North St and Rosemary St	7987	7750	-2.97%
Hillsborough St between Bolinwood Dr and Martin Luther King, Jr. Blvd (NC 86)	6949	6589	-5.18%
Martin Luther King, Jr. Blvd (NC 86) between Piney Mountain Rd and N. Estes Dr	28090	28391	1.07%
Piney Mountain Rd between Timber Hollow Ct and Woodshire Ln	2954	2743	-7.14%
Piney Mountain Rd between Lake Ellen Dr and Oosting Dr	2395	2442	1.96%
Kingston Dr between Balsam Ct and Kingston Ct	1037	1038	0.10%
Homestead Rd between Seawell School Rd and Hearthstone Ln	9472	9030	-4.67%
AVERAGE % CHANGE			-8.66%



2009 Existing Intersection Levels-of-Service

Signalized Intersection Delay	Unsignalized Intersection Delay	LOS
≤10 sec	≤10 sec	A
10-20 sec	10-15 sec	B
20-35 sec	15-25 sec	C
35-55 sec	25-35 sec	D
55-80 sec	35-50 sec	E
≥80 sec	≥50 sec	F

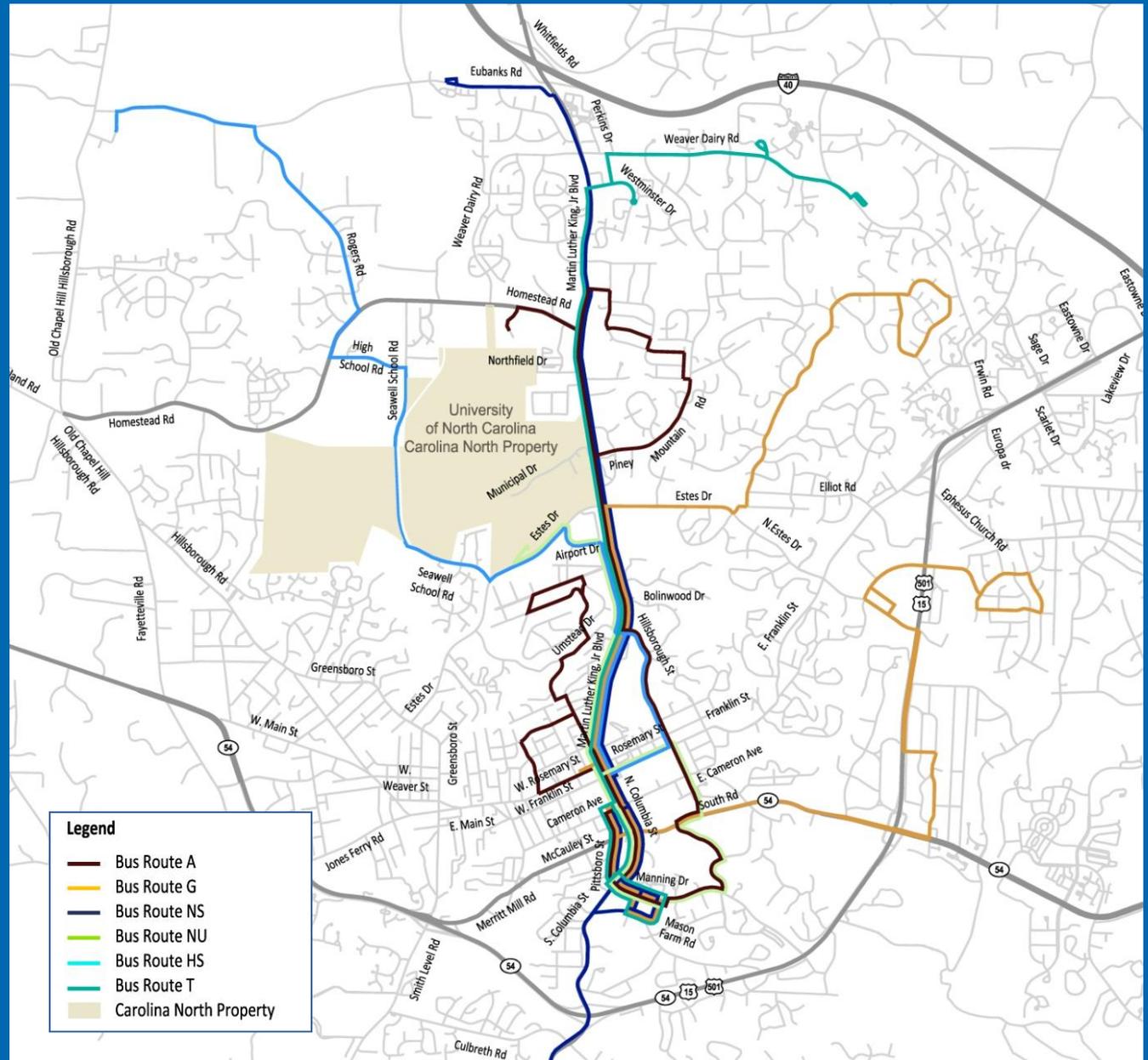




Existing Chapel Hill Transit

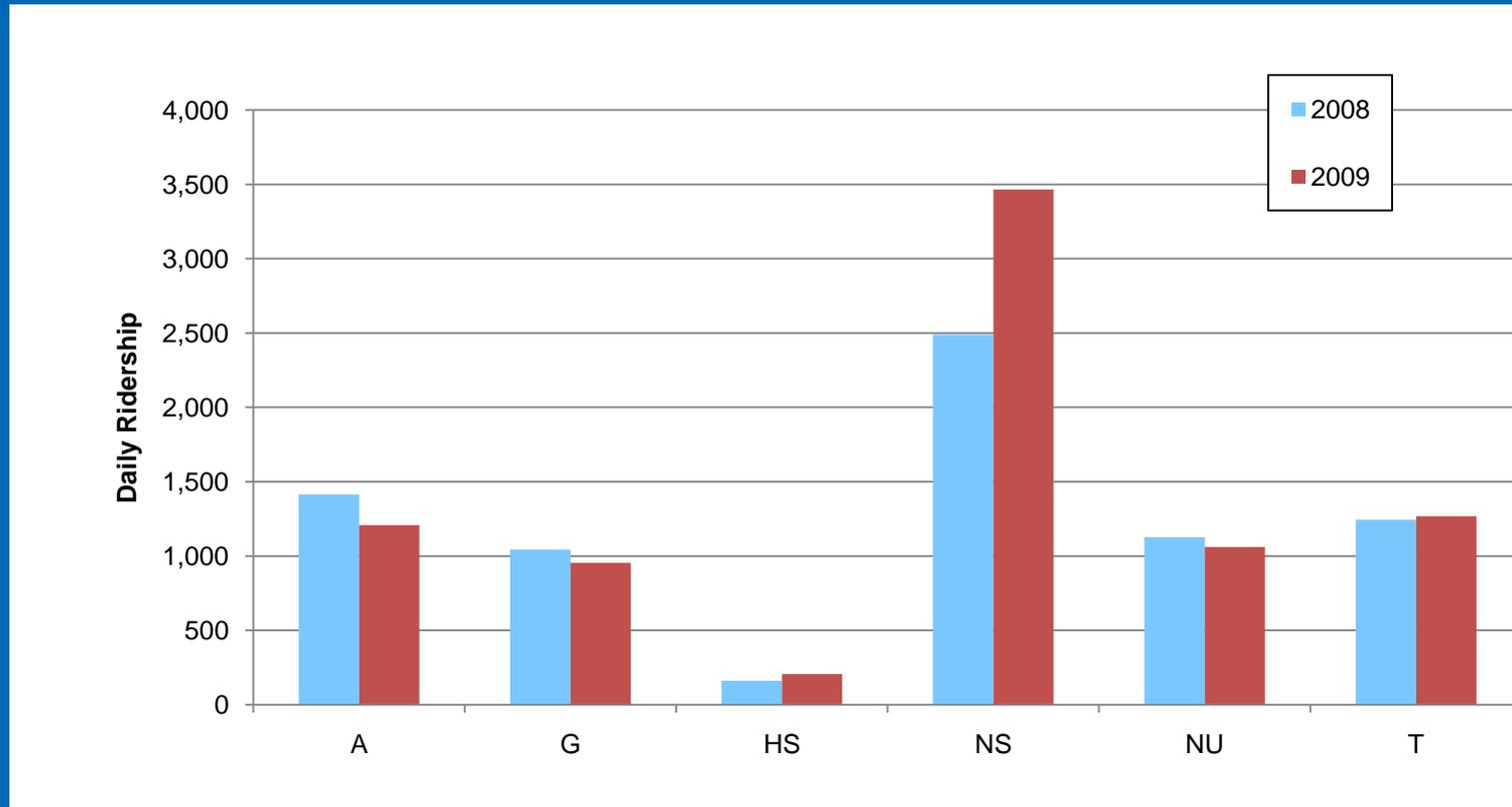
Routes near Carolina North*:

- Route A
- Route G
- Route NS
- Route NU
- Route HS
- Route T





Transit Ridership Comparison





Existing Available Transit Capacity To & From Carolina North

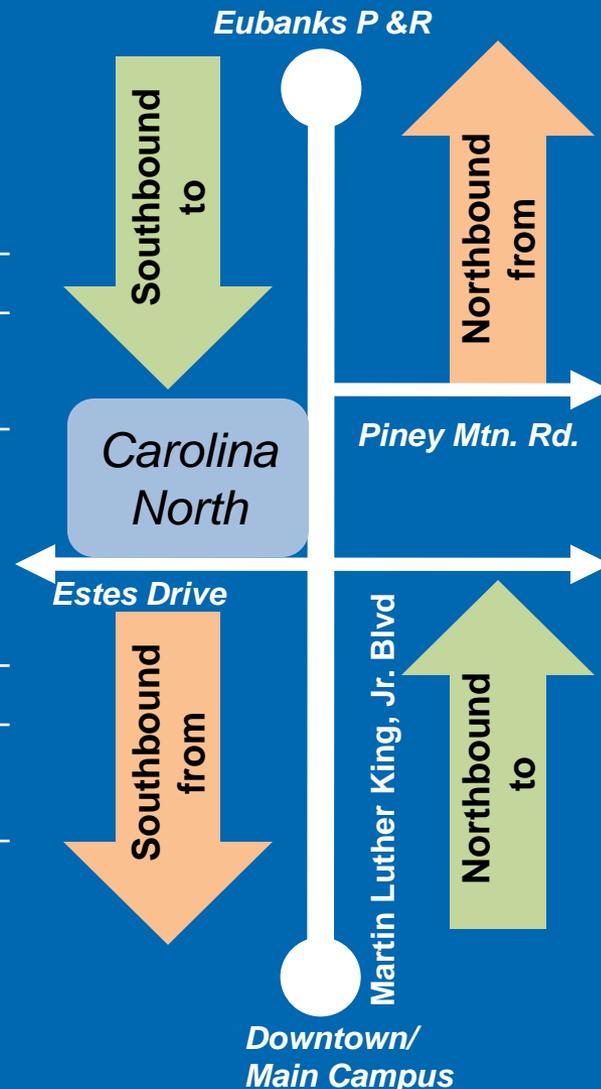
AM PEAK HOUR

Approaching Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	1,122	65	1,057
Southbound	942	352	590

Departing Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	942	71	871
Southbound	1,122	488	634



For Routes A, G, HS, NS, NU, and T only.



Existing Available Transit Capacity To & From Carolina North

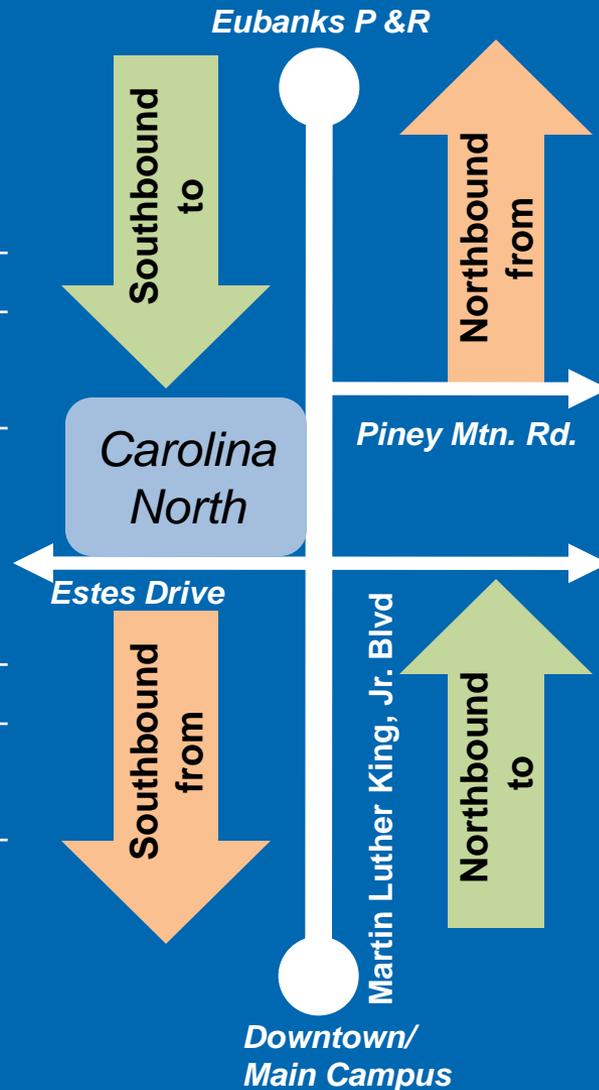
MIDDAY PEAK HOUR

Approaching Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	495	114	381
Southbound	570	85	485

Departing Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	375	54	321
Southbound	630	130	500



For Routes A, G, HS, NS, NU, and T only.



Existing Available Transit Capacity To & From Carolina North

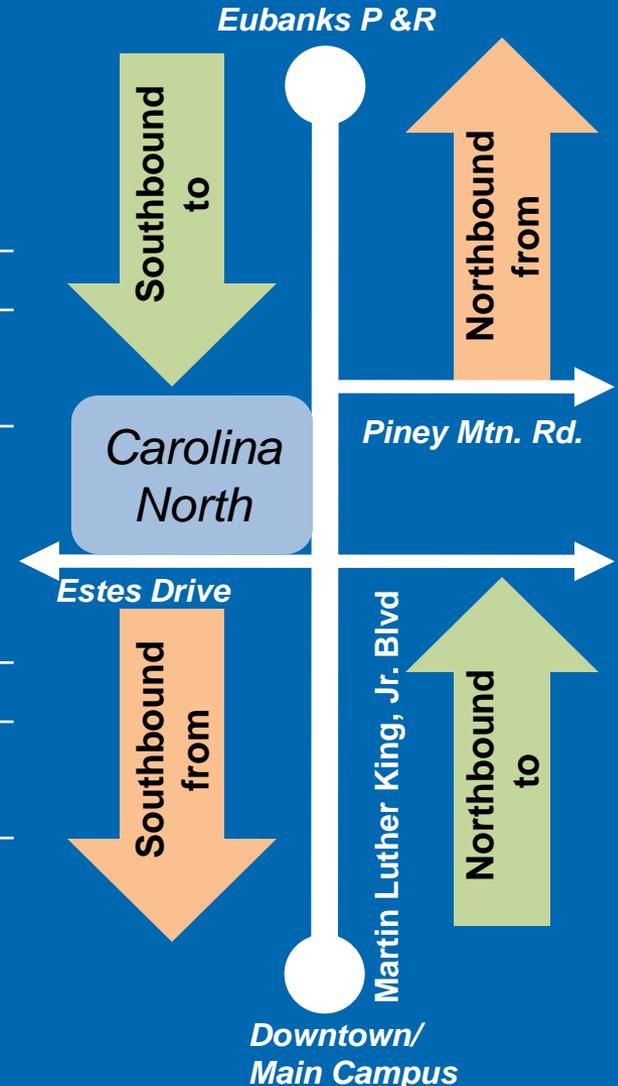
PM PEAK HOUR

Approaching Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	918	393	525
Southbound	798	85	713

Departing Carolina North

	Total Capacity	Existing Load	Remaining Capacity
Northbound	798	236	562
Southbound	978	109	869



For Routes A, G, HS, NS, NU, and T only.



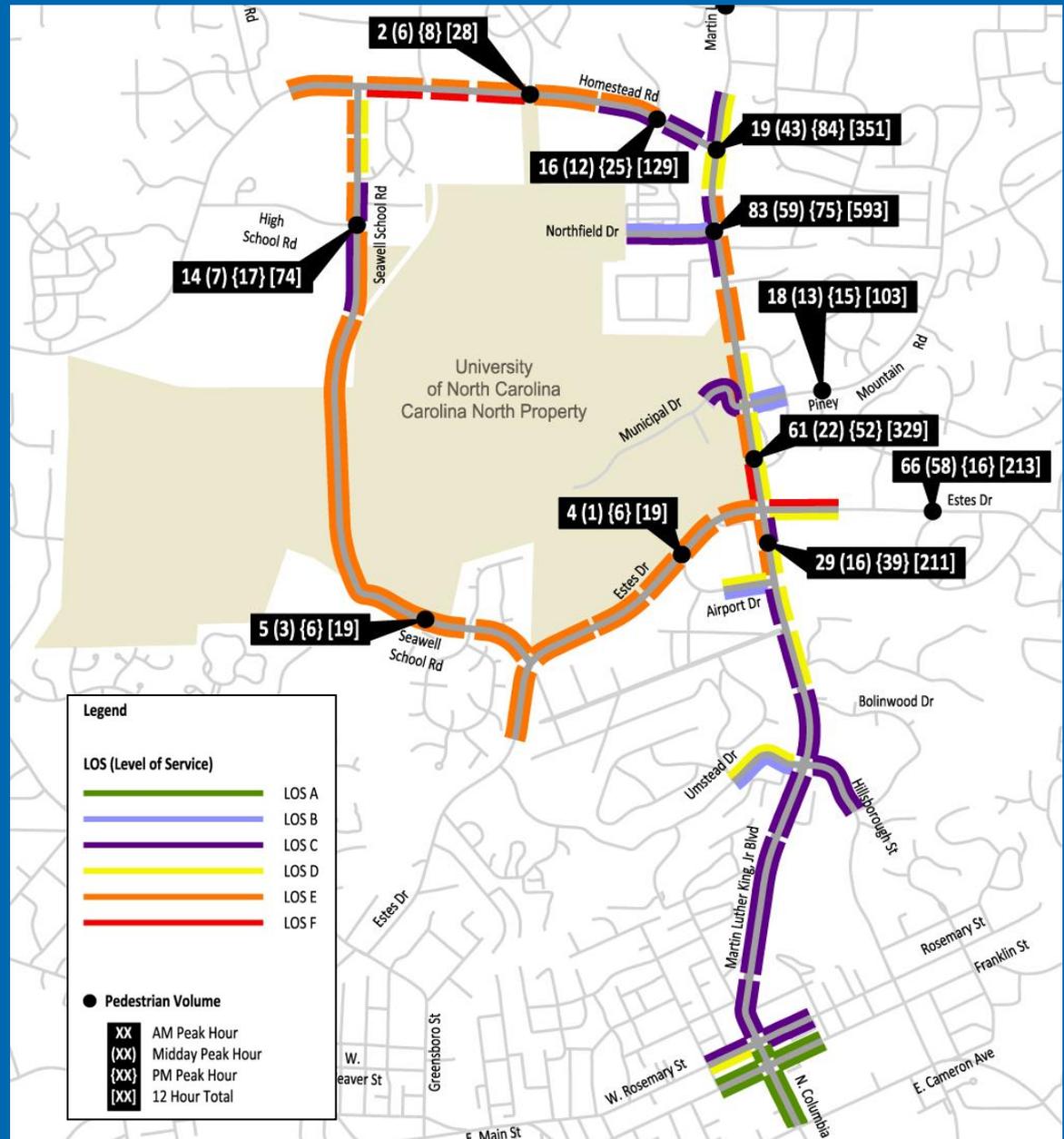
Park-and-Ride Comparison

Lot Name	Owner	Bus Routes Serving Lot	No. of Parking Spaces	Parking Occupancy Fall 2007	Parking Occupancy April 2009	Parking Occupancy Nov 2009	Available Parking Spaces
Eubanks	Chapel Hill	NS	400	234	201	268	132
Carrboro Plaza	Chapel Hill	CPX, CW	145	136	132	111	34
Jones Ferry	Chapel Hill	JFX, CW, CM	443	252	240	230	213
Southern Village	Chapel Hill	NS, V	400	388	332	385	15
NC-54 East	Chapel Hill	HU, S	512	508	505	512	0
Friday Center	University	HU, V, FCX	871	882	867	871	0
Chatham County	University	CCX	550	150	215	214	336
Franklin Street	University	CL, D, F, M	67	67	67	67	0
Martin Luther King, Jr. Blvd	University	G, HS, NS, NU, T	40	39	39	40	0
Total			3,428	2,656	2,598	2,698	730



Existing Pedestrian Volumes and Levels-of-Service*

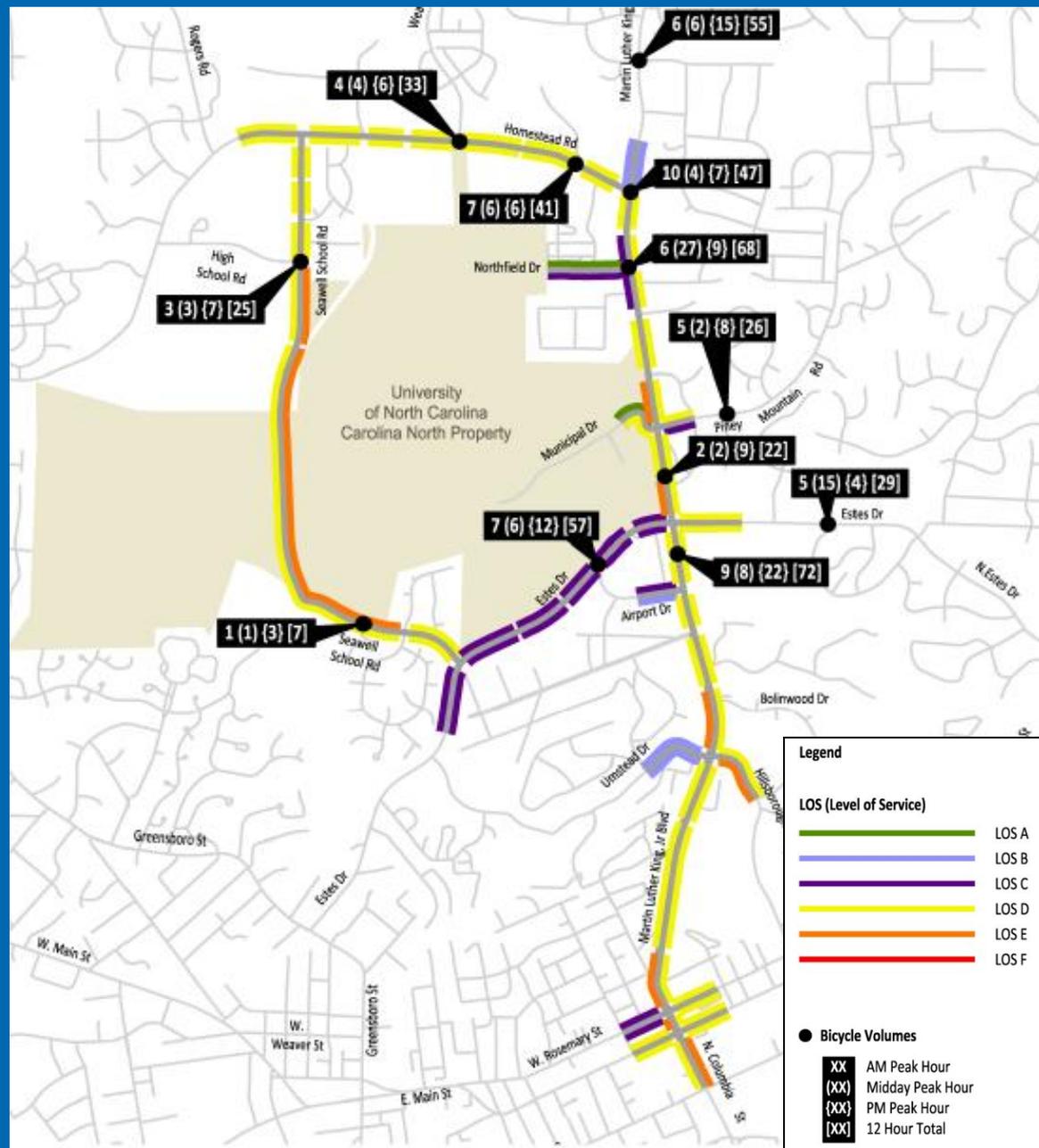
*Pedestrian LOS analysis was performed in accordance with the Transportation Research Board's *Multimodal Level of Service Analysis for Urban Streets (NCHRP Report 616)*





Existing Bicycle Volumes and Levels-of-Service*

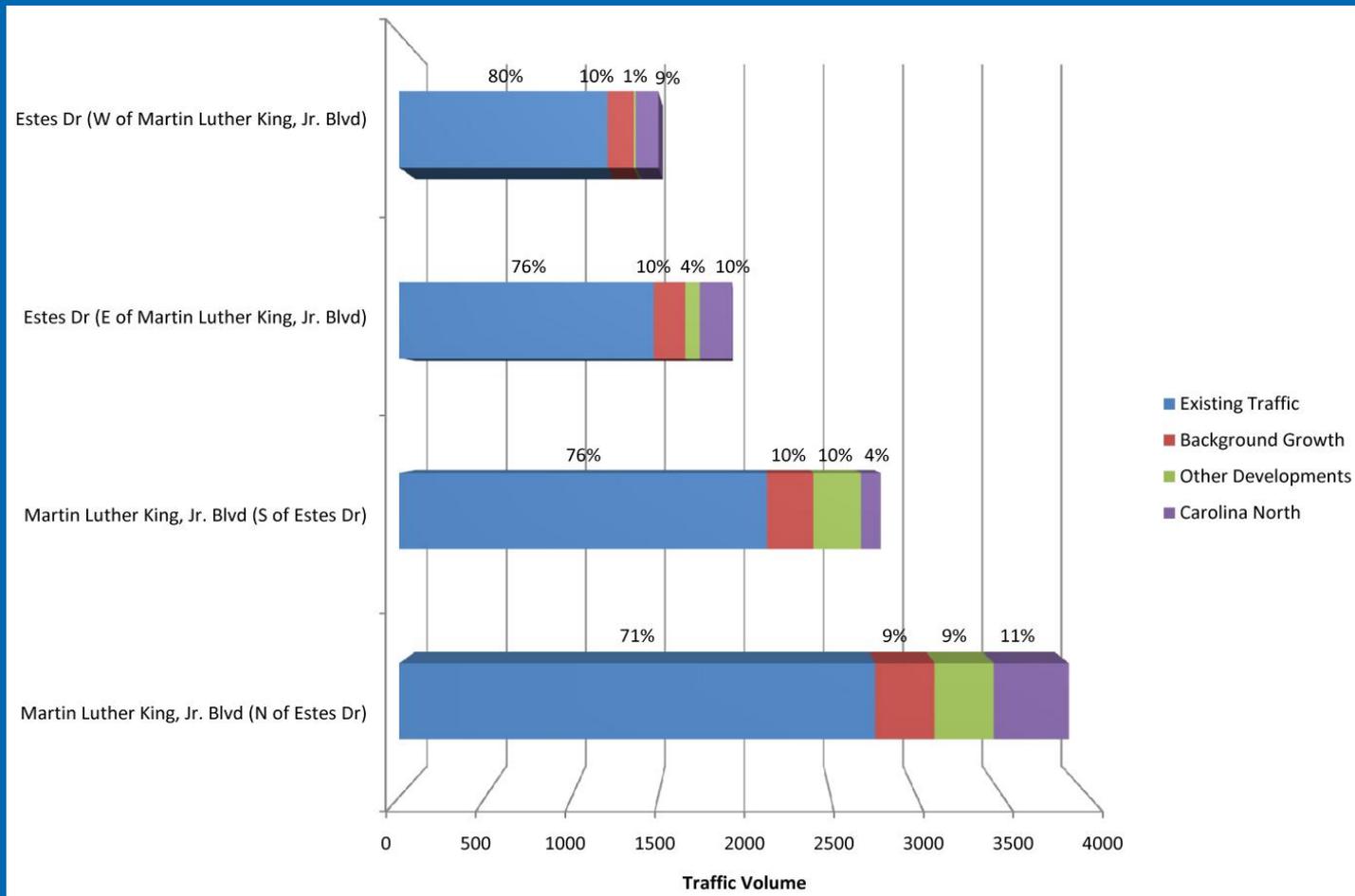
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2015 Screen-Line Analysis

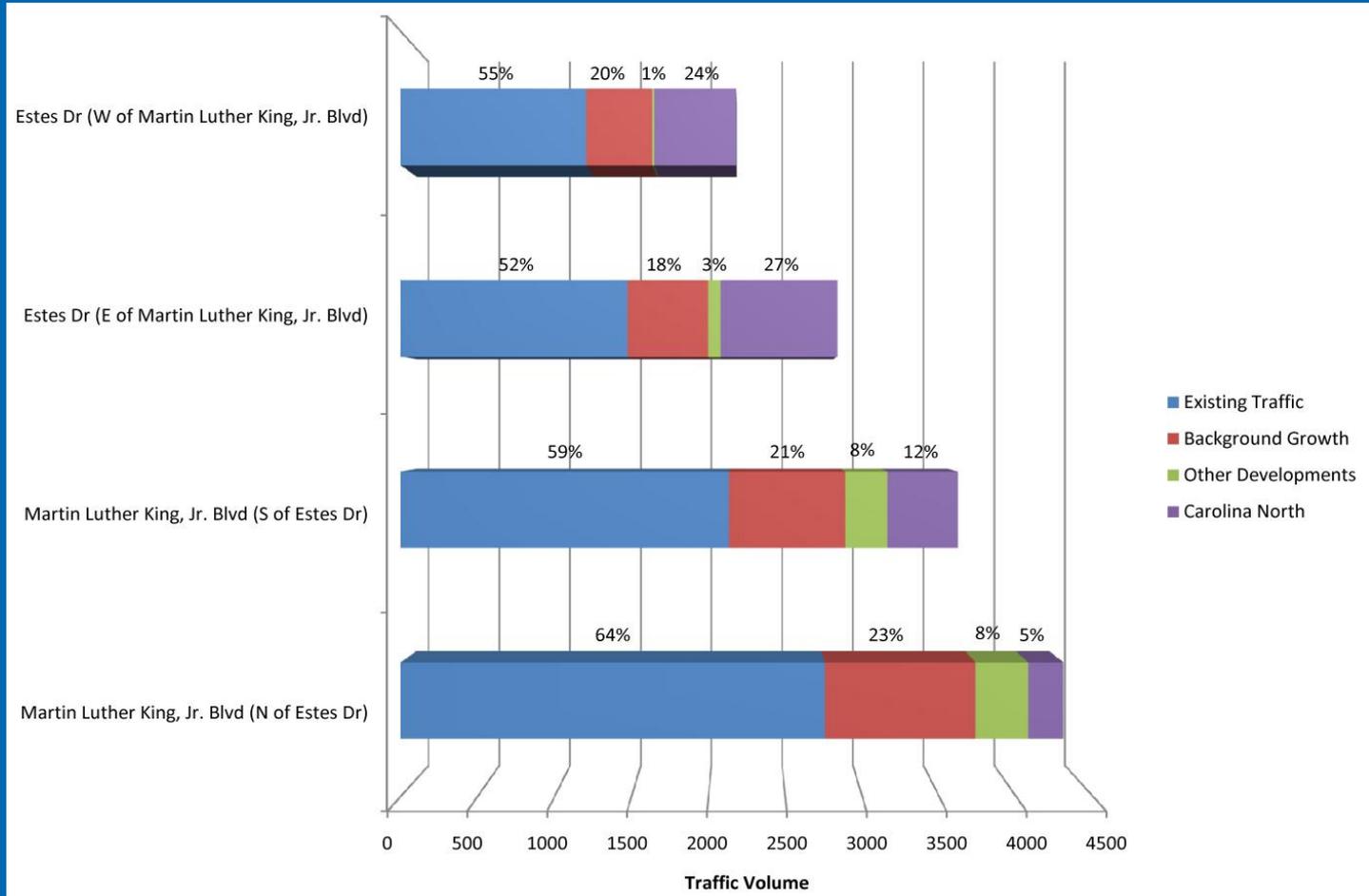
Martin Luther King, Jr. Boulevard & Estes Drive – PM Peak Hour





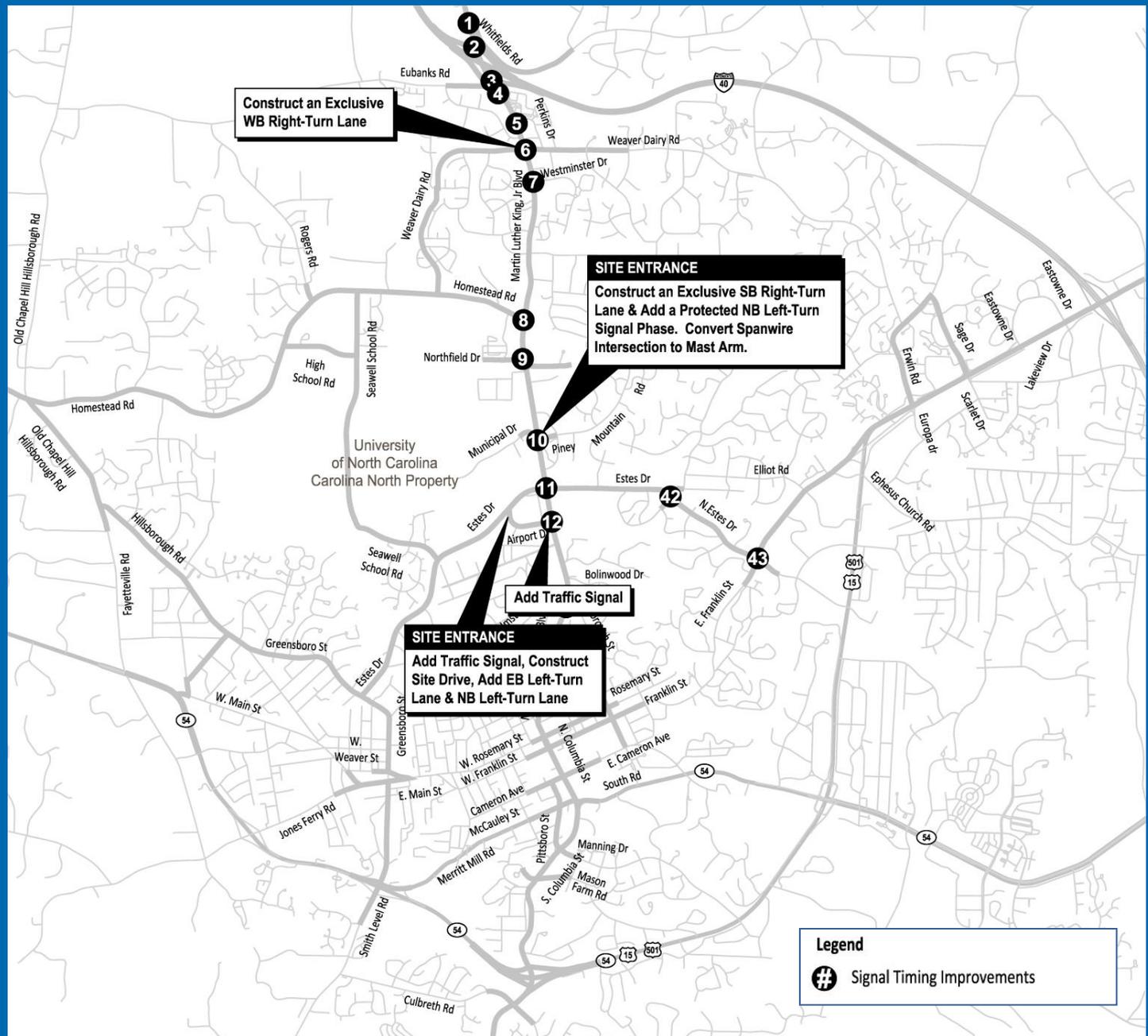
2030 Screen-Line Analysis

Martin Luther King, Jr. Boulevard & Estes Drive – PM Peak Hour



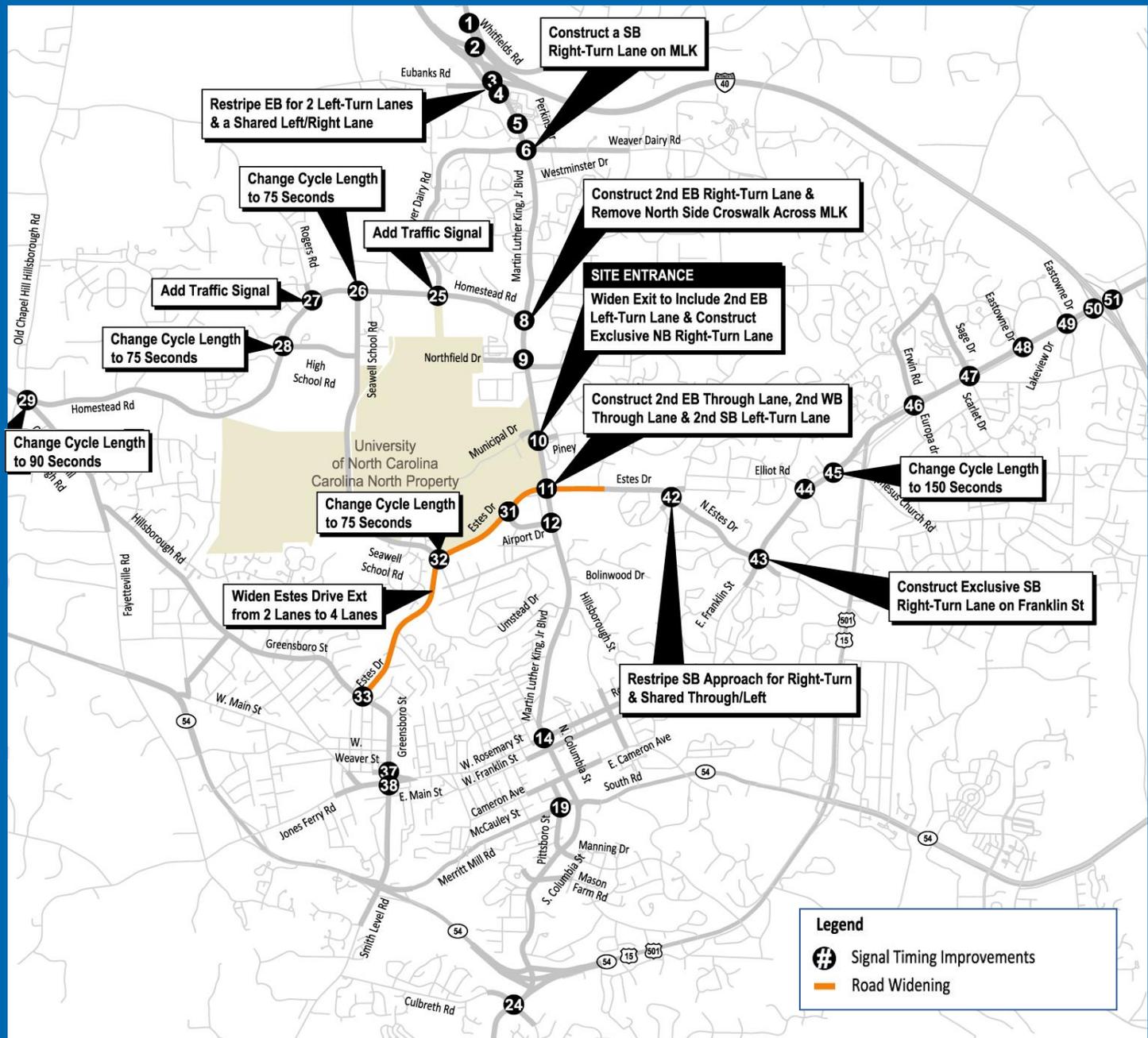


2015 Intersection Impacts and Potential Mitigation





2030 Intersection Impacts and Potential Mitigation





Streets Evaluated for Traffic Calming Implementation

Carolina North Traffic Expected

- Piney Mountain Road
- Hillsborough Street
- Seawell School Road
- North Elliott/Curtis/Caswell Roads

Carolina North Traffic Possible

- Northwoods Road
- North Lakeshore Drive
- Barclay Road

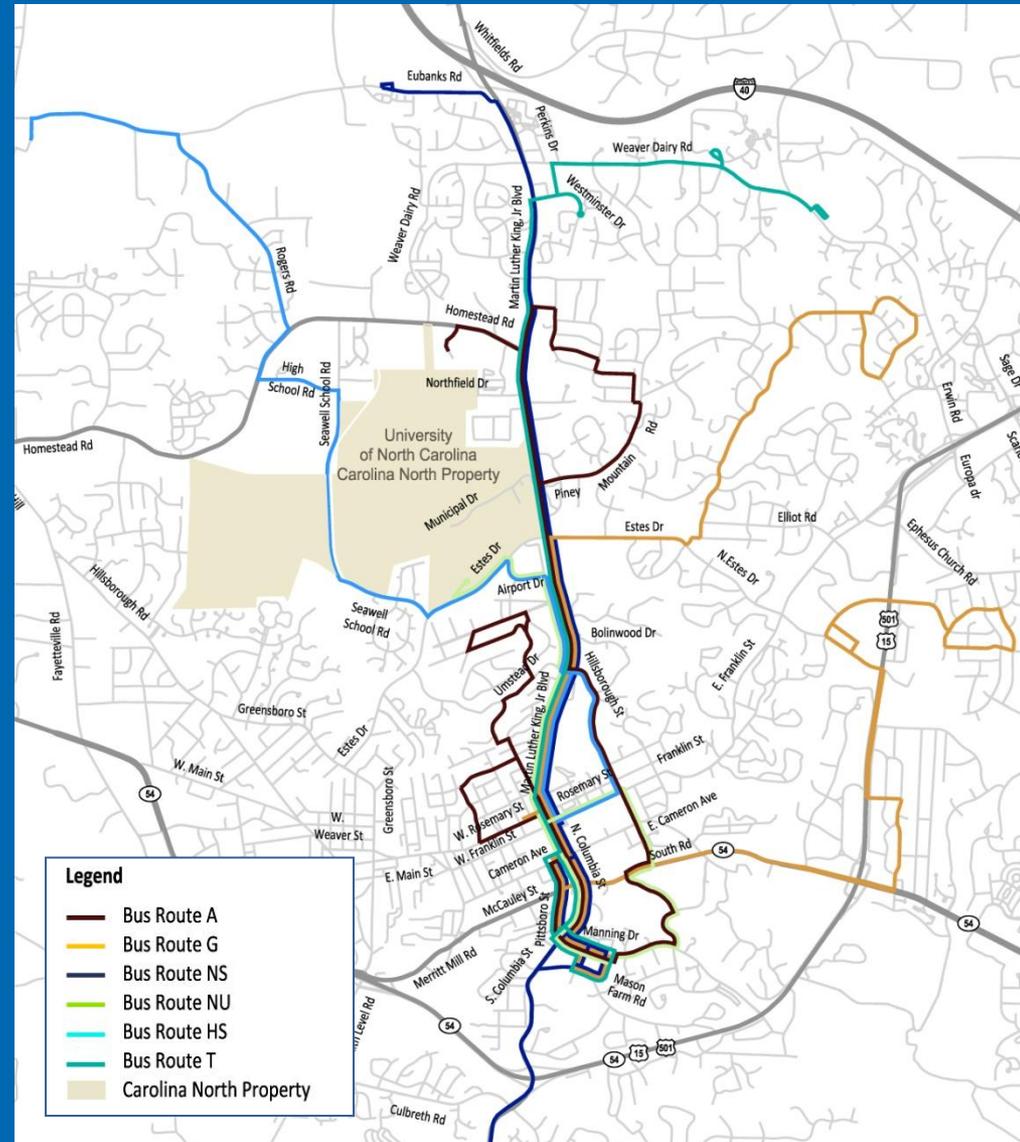




Transit Impacts

2015 TIA Phase 1 (800,000 SF of Development)

- Available capacity remains on all routes serving Carolina North
- No additional vehicles needed to serve Carolina North
- Approximately 500 additional Park-and-Ride spaces needed
- Route adjustments to provide stops within the site
- Analysis assumes that 10 minute headway continues on NS Route



Note: Analysis is based on existing ridership which may change over time

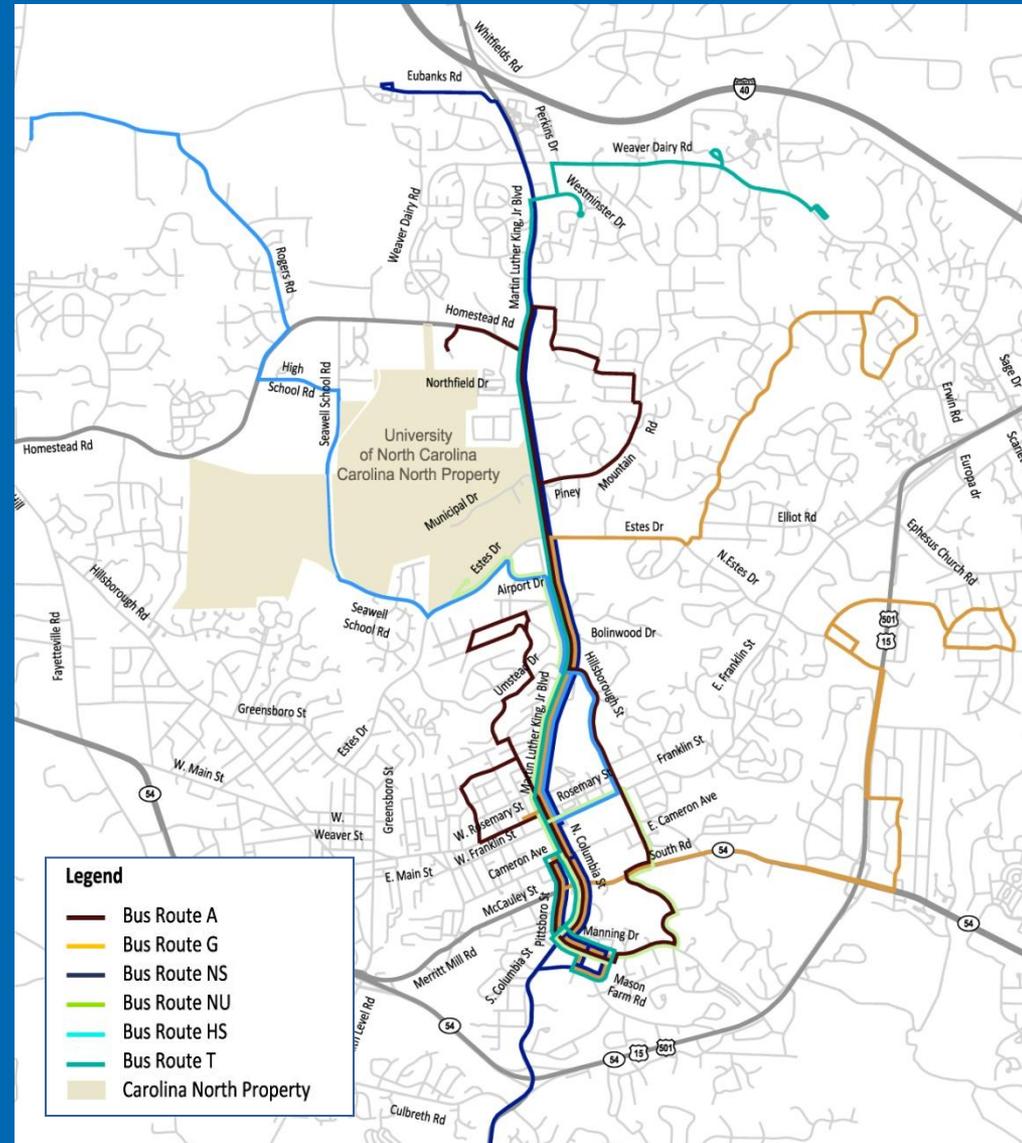


Transit Impacts

2030 TIA Phase 2

(3,000,000 SF of Development)

- Additional service needed on A, G, NS and T Routes
- 13 additional vehicles needed to serve Carolina North
- Approximately 1,500 additional Park-and-Ride spaces needed
- Route structure may need to change if additional stops within the site are needed
- Analysis assumes that 10 minute headway continues on NS Route

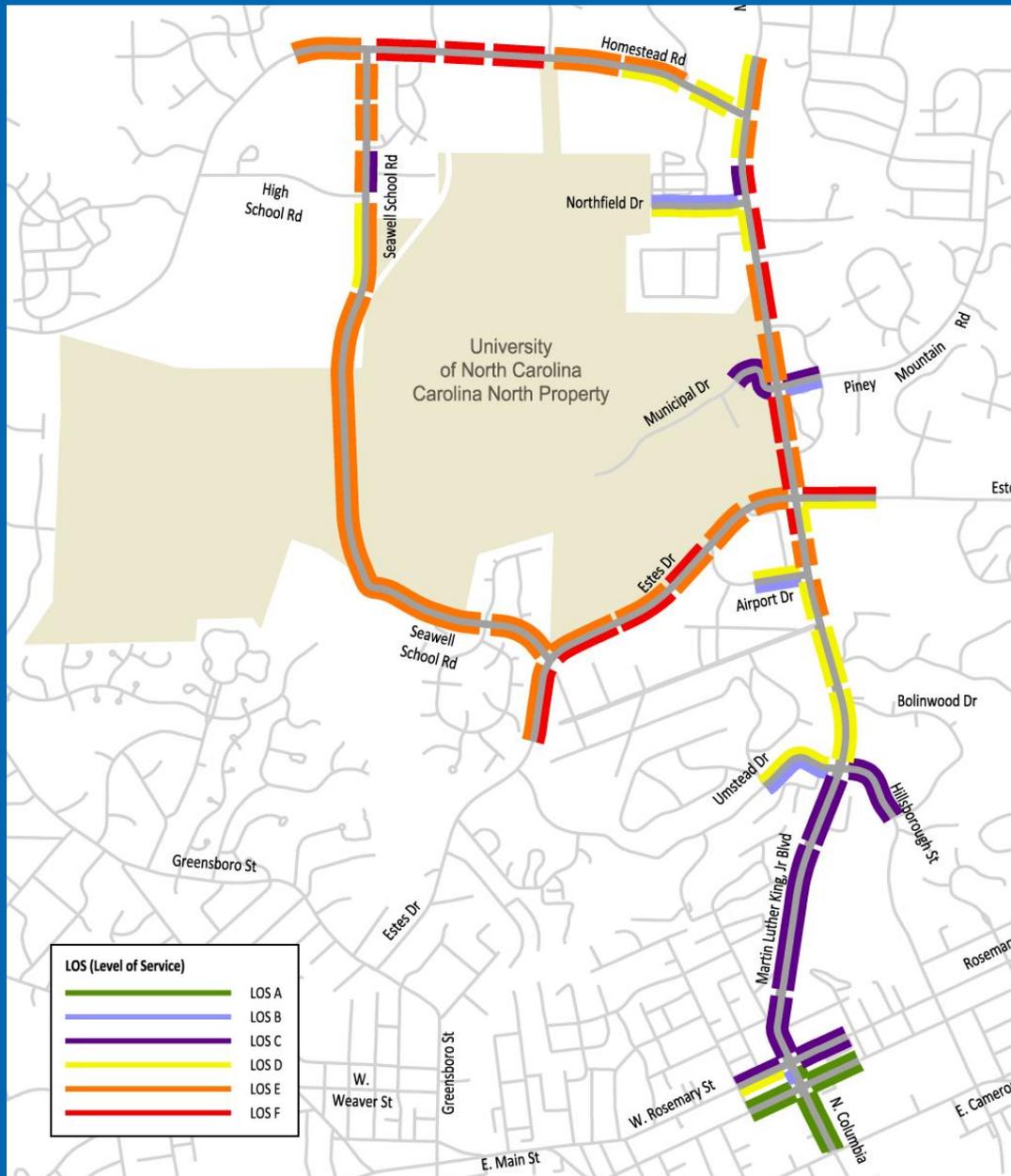


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2015 No-Build Pedestrian Levels-of-Service*

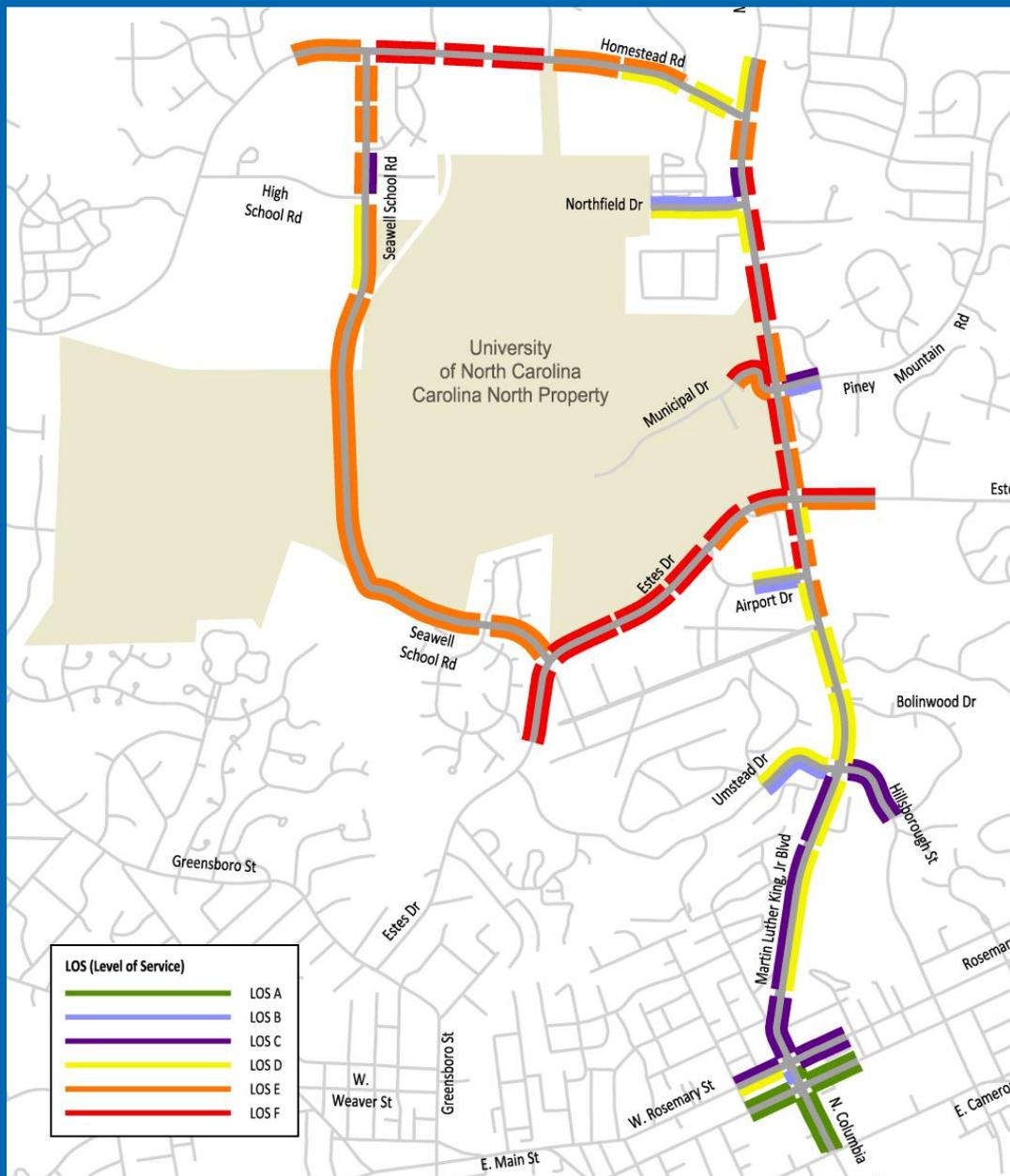
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2015 Build Pedestrian Levels-of- Service*

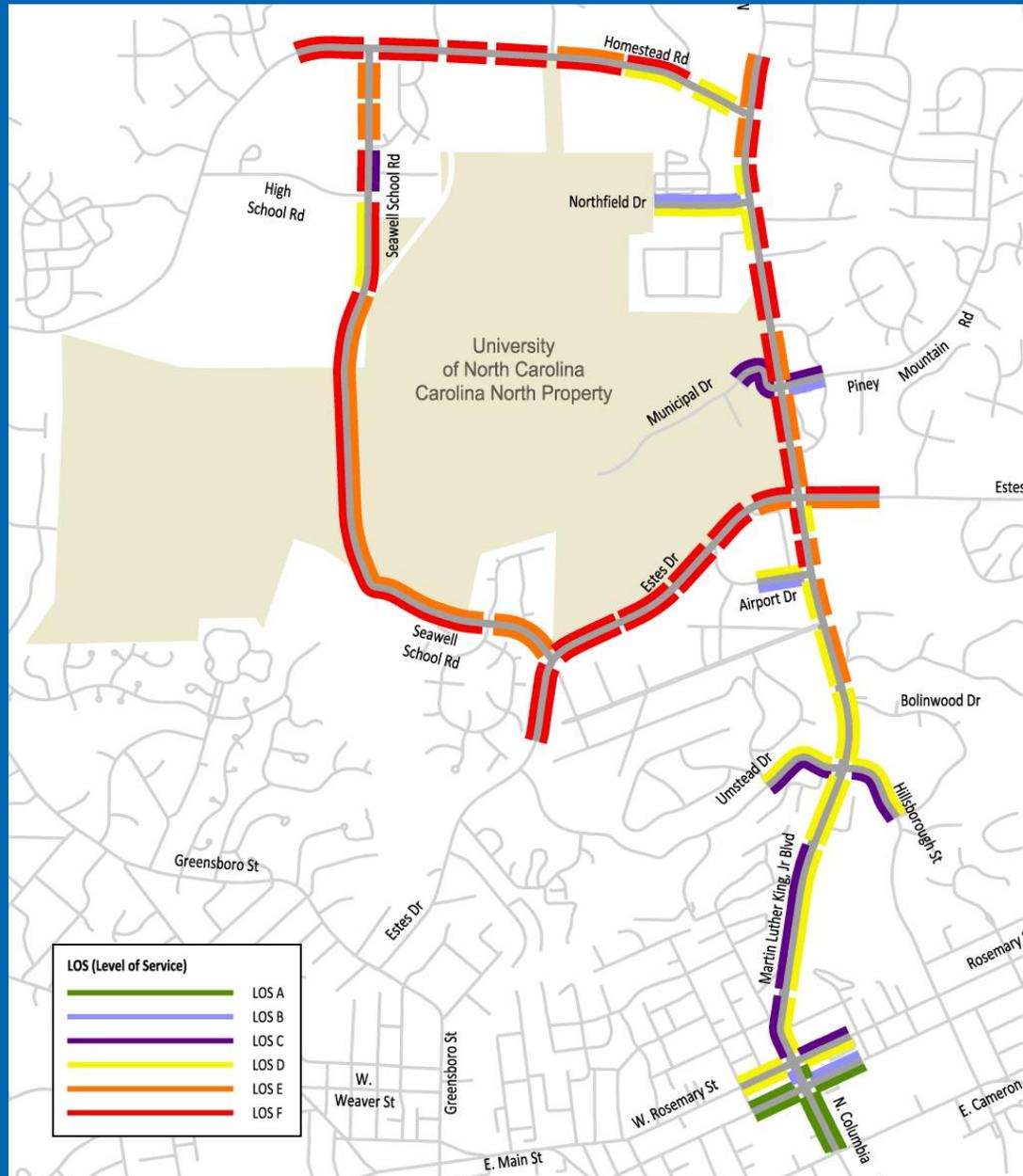
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2030 No-Build Pedestrian Levels-of- Service*

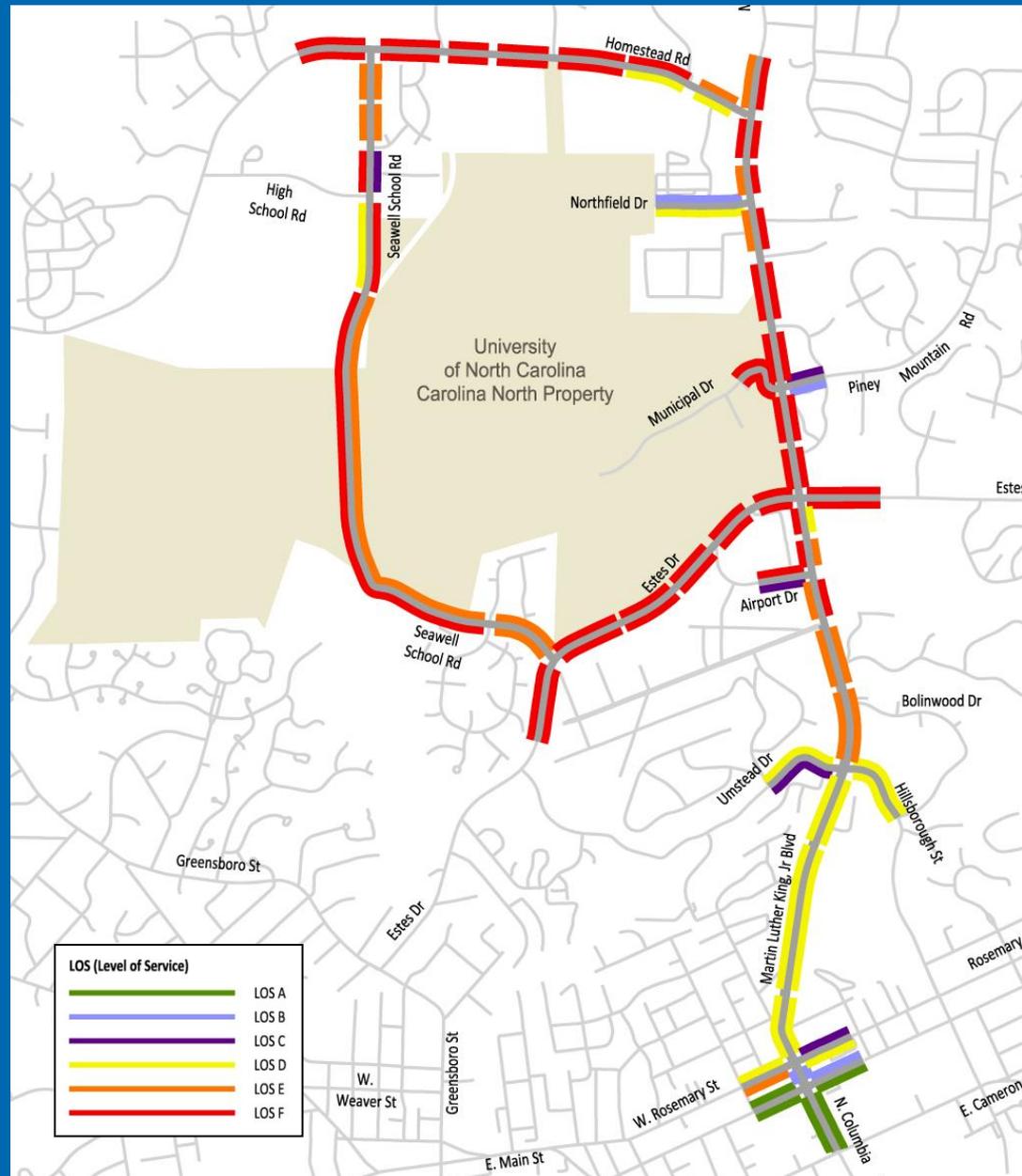
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2030 Build Pedestrian Levels-of- Service*

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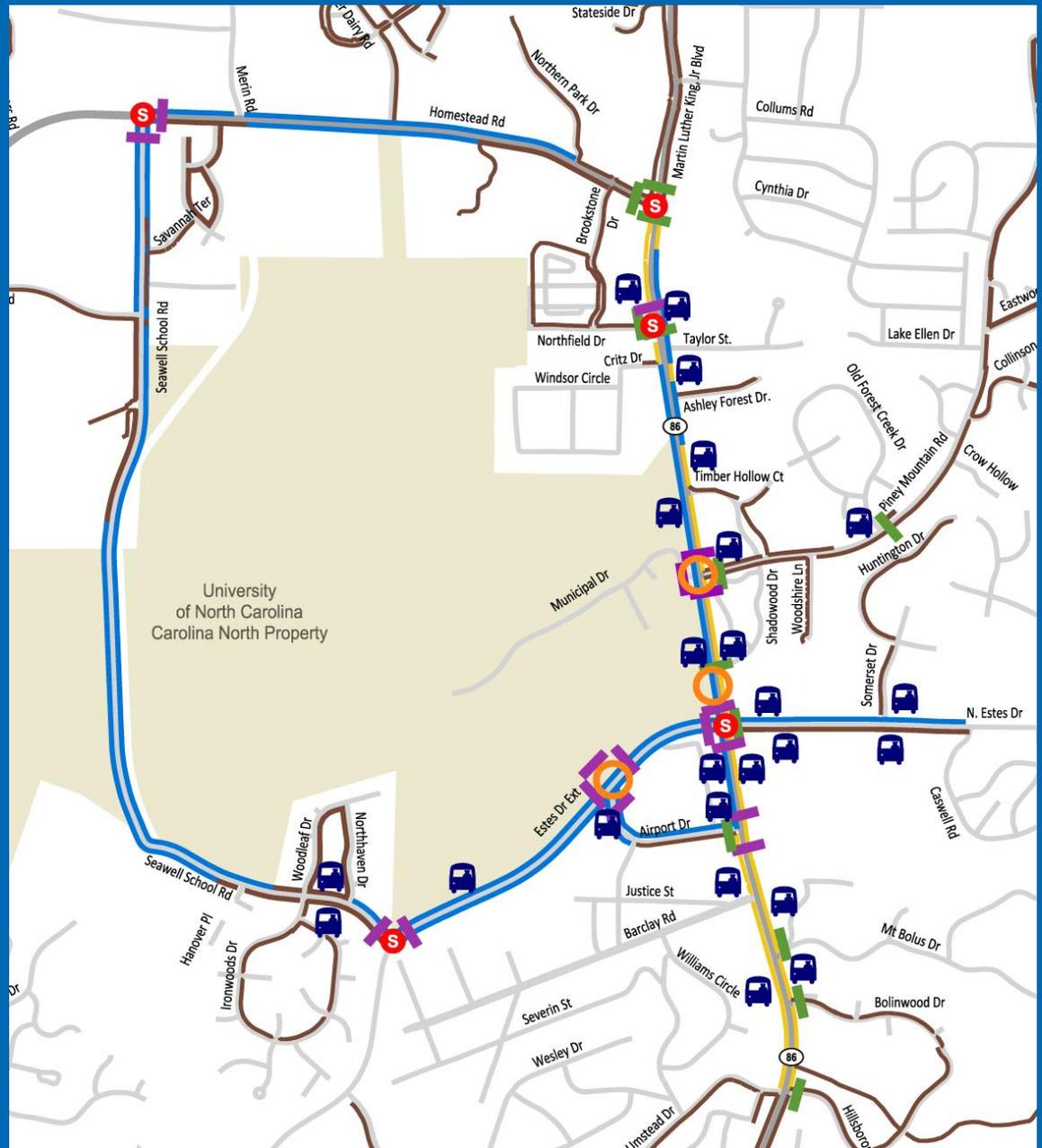


Pedestrian Facility Needs

Legend

- Signalized Intersections
- Existing Sidewalk
- Recommended New Sidewalk
- Recommended Reconstruction of Existing Sidewalk
- Existing Crosswalk
- Recommended New Crosswalk
- Access Points
- Existing Bus Stop

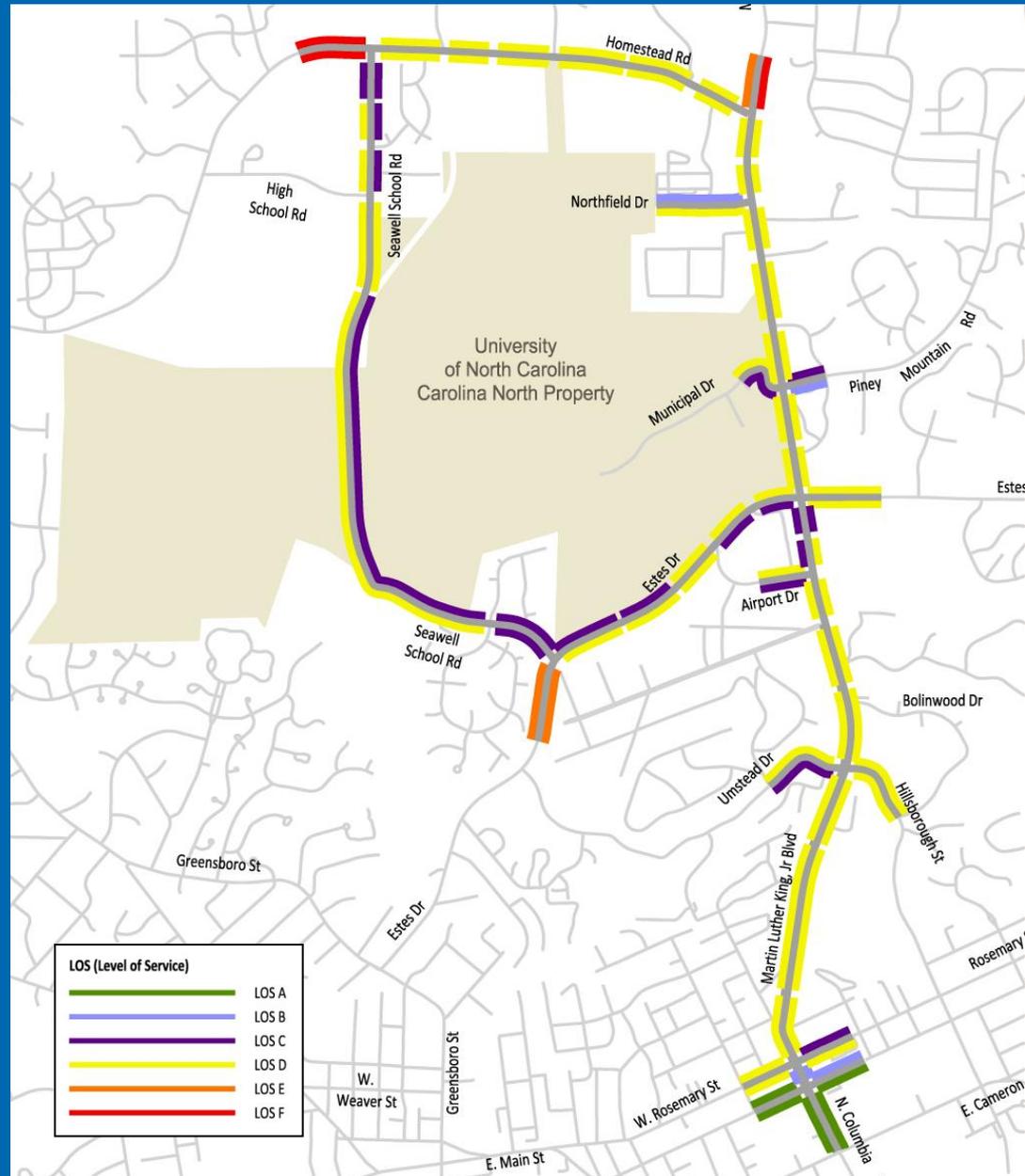
Note: Recommendations are the outcome of the LOS analysis, and do not necessarily reflect the improvements committed by the Carolina North development.





2030 Build Pedestrian Levels-of- Service with Mitigation*

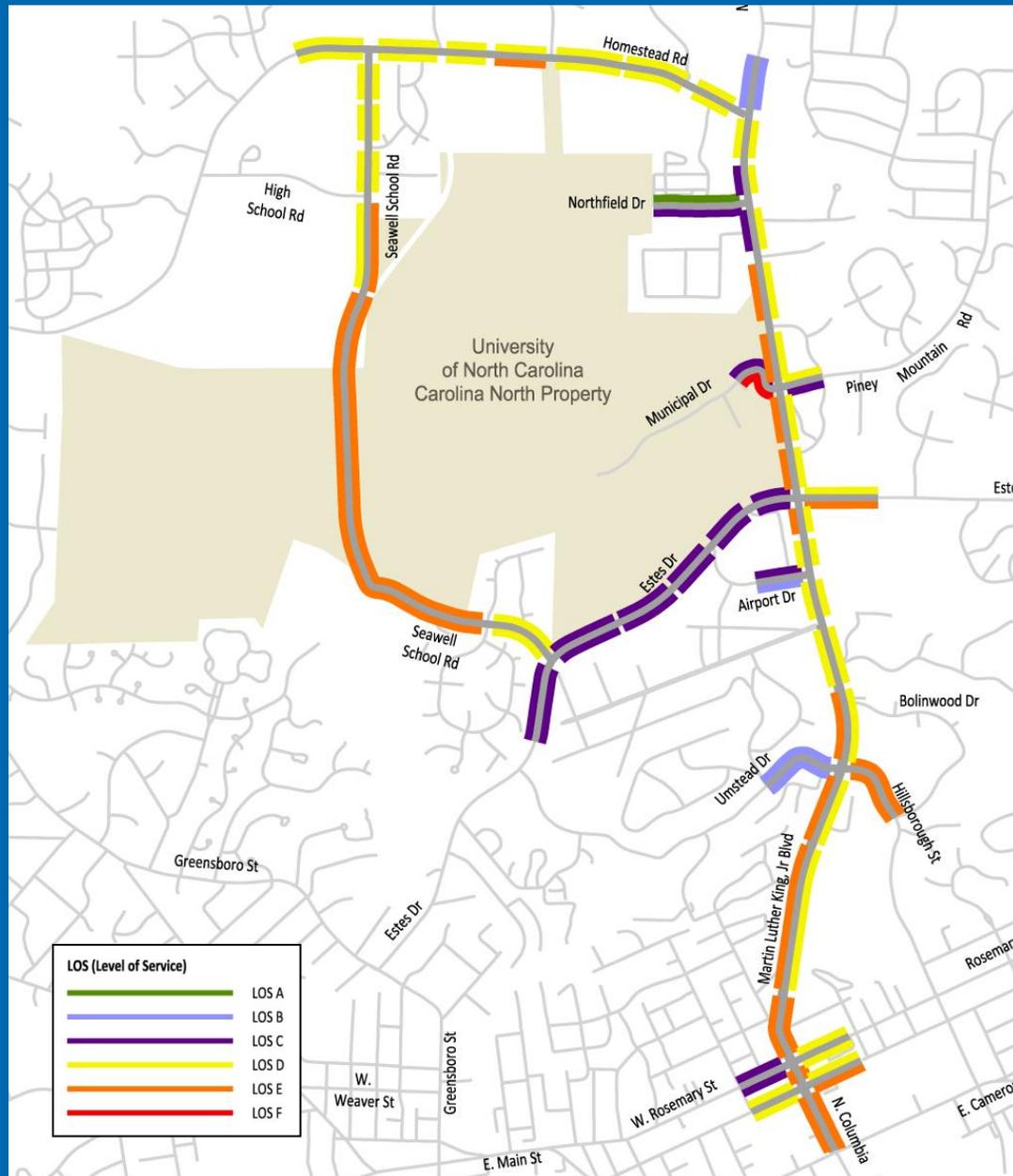
*Pedestrian LOS analysis was performed in accordance with the Transportation Research Board's *Multimodal Level of Service Analysis for Urban Streets (NCHRP Report 616)*





2015 Build Bicycle Levels-of- Service*

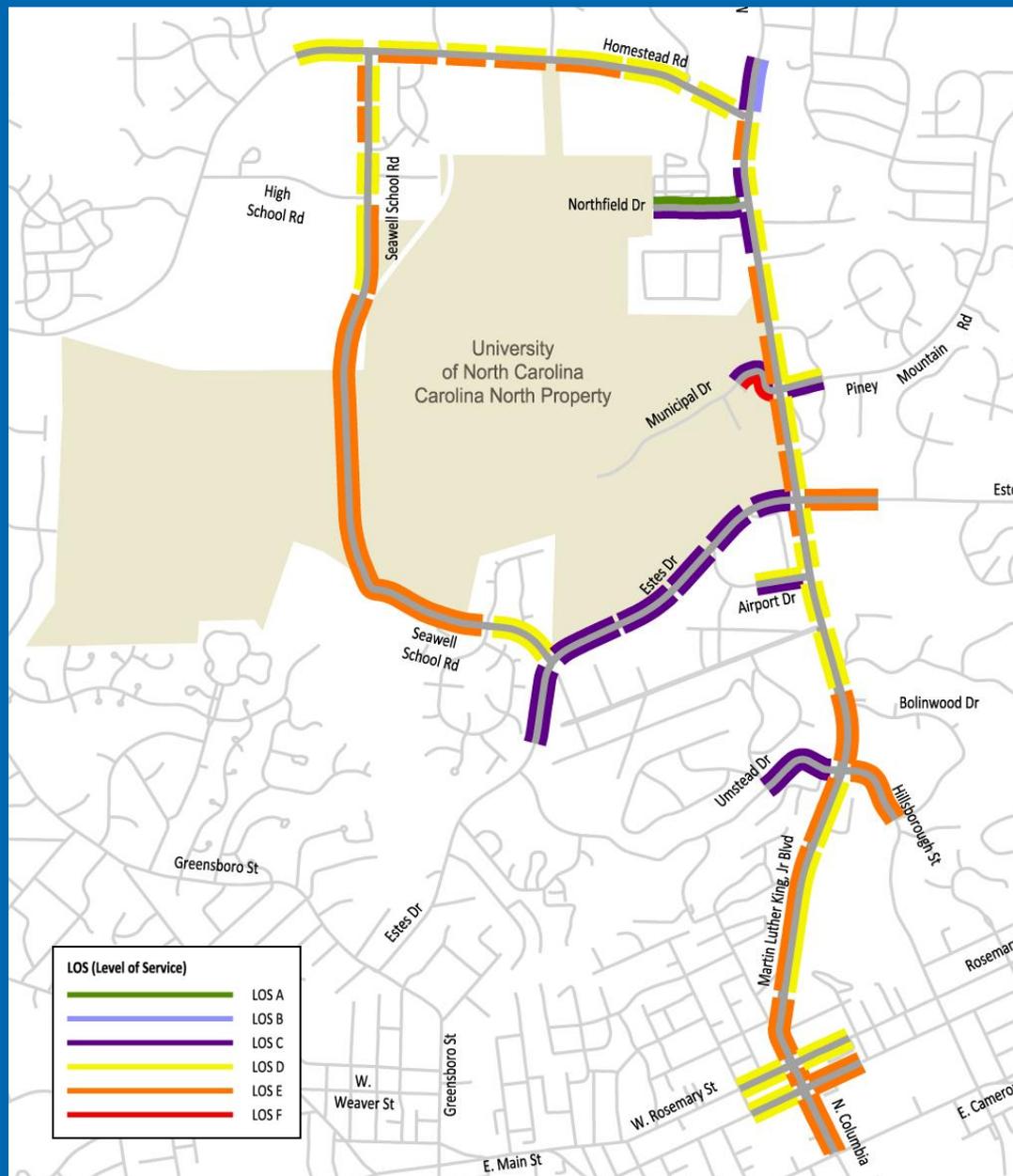
*Bicycle LOS analysis was performed in accordance with the Transportation Research Board's *Multimodal Level of Service Analysis for Urban Streets (NCHRP Report 616)*





2030 Build Bicycle Levels-of- Service*

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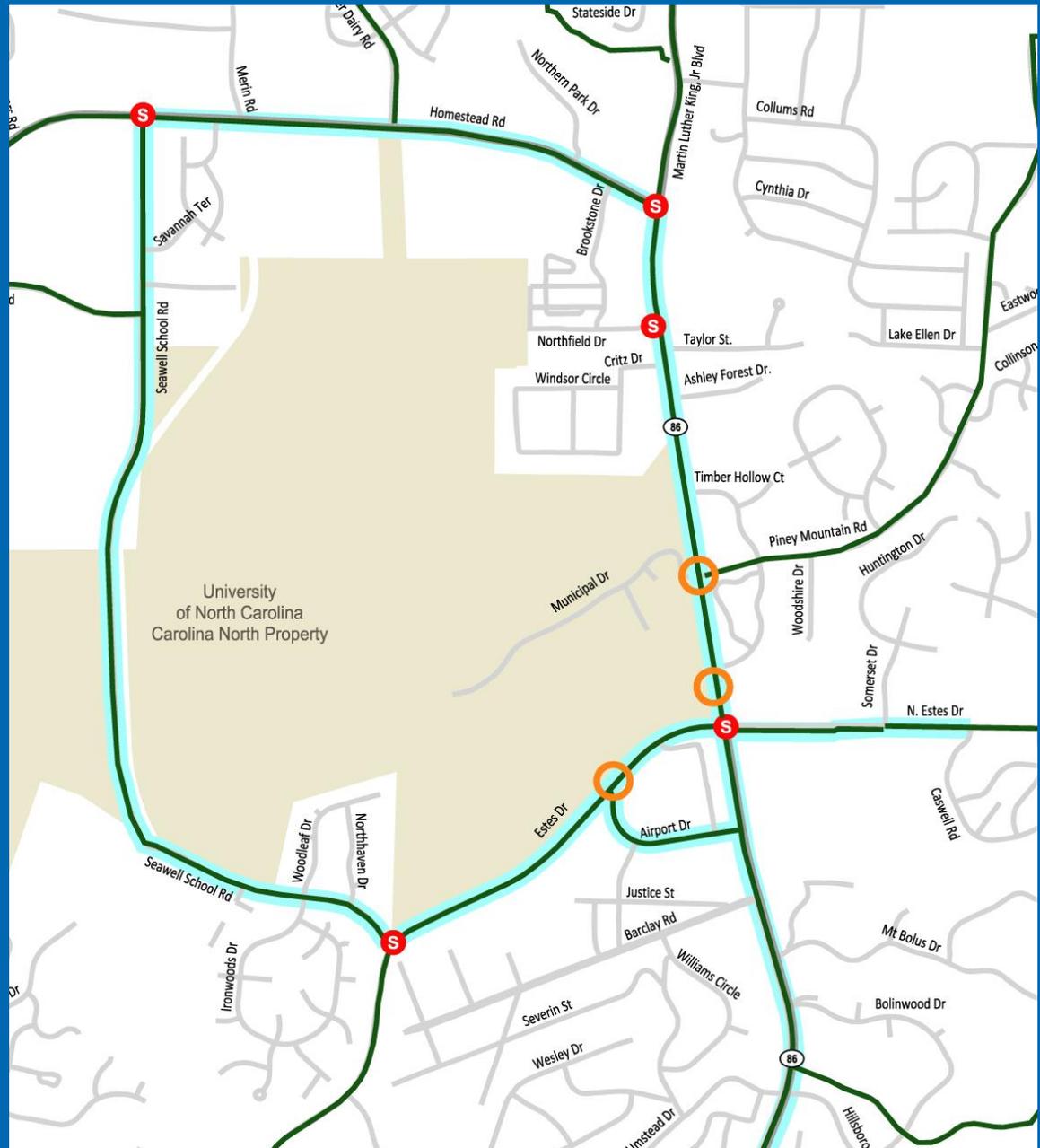


Bicycle Facility Needs

Legend

- Study Area Intersections
- Existing Bicycle Network
- Recommended New Bicycle Lanes
- Access Points

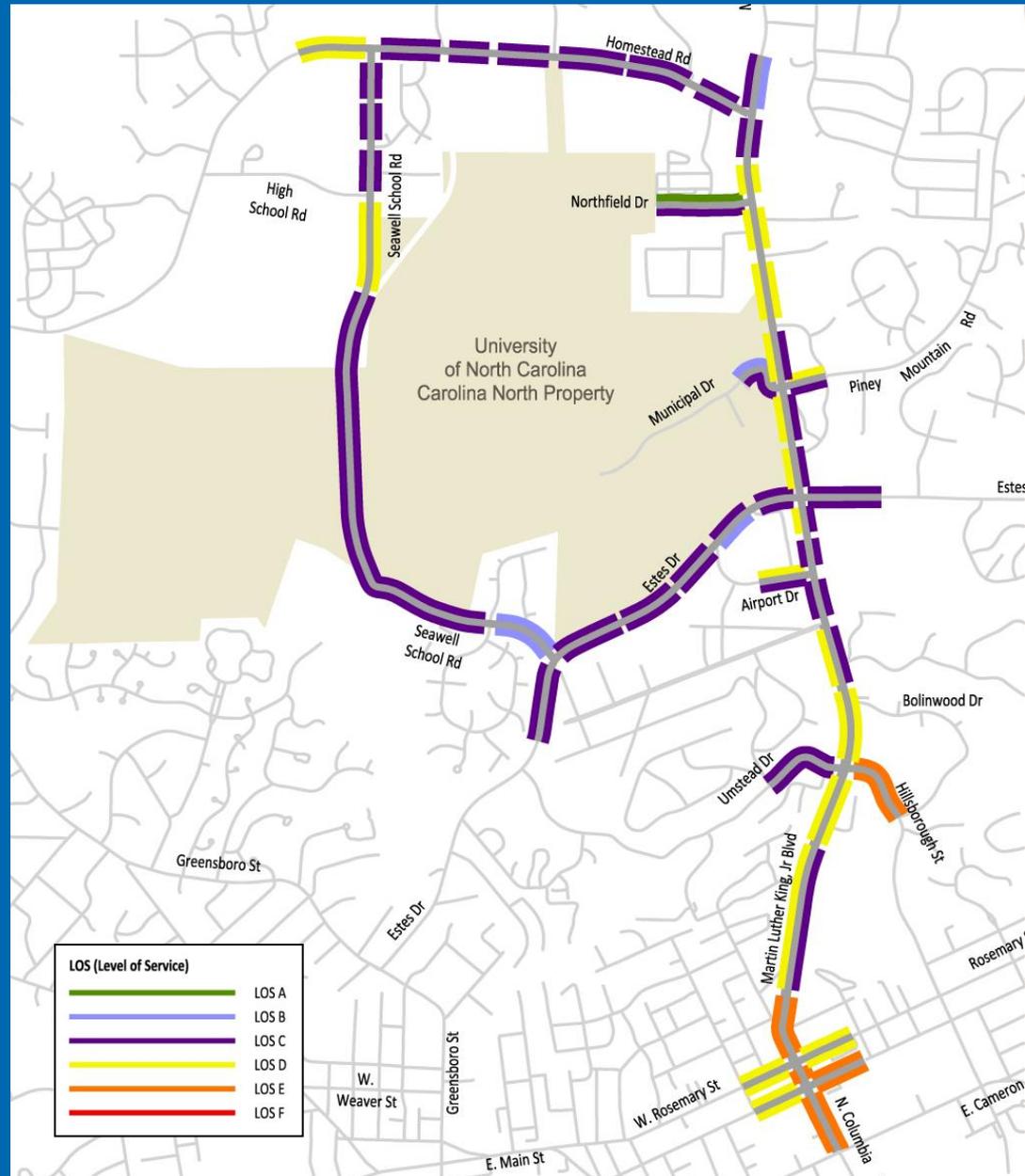
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2030 Build Bicycle Levels-of- Service with Mitigation*

*Bicycle LOS analysis was performed in accordance with the Transportation Research Board's *Multimodal Level of Service Analysis for Urban Streets (NCHRP Report 616)*





2015 Mitigation Summary

- Traffic Mitigation
 - Optimization of the Martin Luther King, Jr. Boulevard signal system
 - Construction of an additional turn lane at the intersections along Martin Luther King, Jr. Boulevard of Estes Drive, Piney Mountain Road/Municipal Drive, and Weaver Dairy Road
 - Reconstruction of Municipal Drive as the primary site access
 - Construction of a second site access on Estes Drive aligned with Airport Drive (for transit connection)
 - Signalization of the intersections of Martin Luther King, Jr. Boulevard & Airport Drive and Estes Drive Extension & Airport Drive (for transit connection)
- Traffic Calming
 - Further exploration with neighborhoods on roadways expected to carry Carolina North traffic



2015 Mitigation Summary

- Pedestrian and Bicycle Facilities
 - Completion of the sidewalk network near Carolina North in accordance with design recommendations
 - The upgrade of pedestrian crossings at signalized intersections surrounding the site
 - Completion of the bicycle lane network near Carolina North in accordance with design recommendations
- Transit
 - Provide an increase in Park-and-Ride spaces
 - Route adjustments to provide stops within the site
 - Investigation of signal priority and potential bus lanes on Martin Luther King, Jr. Boulevard
 - Maintain 10 minute headway on NS Route



2030 Mitigation Summary

- Traffic Mitigation
 - Optimization of the Martin Luther King, Jr. Boulevard signal system
 - Construction of an additional turn lane at five intersections along Martin Luther King, Jr. Boulevard
 - Reconstruction of Estes Drive from just east of Martin Luther King, Jr. Boulevard to Greensboro Street to a four-lane cross-section
 - Signal timing modifications to sixteen intersections throughout the study area
 - Potential signalization at the intersections of Homestead Road & Weaver Dairy Road and Homestead Road & Rogers Road
- Traffic Calming
 - Monitor traffic conditions in residential neighborhoods for traffic calming implementation



2030 Mitigation Summary

- Pedestrian and Bicycle Facilities
 - Provide improved pedestrian and bicycle facilities with reconstruction Estes Drive Extension
 - Construction of pedestrian crossing refuge islands on Martin Luther King, Jr. Boulevard and Estes Drive Extension where needed
- Transit
 - Additional service needed on the NS Route and T Route
 - 13 additional vehicles needed to serve Carolina North
 - Provide an additional increase in Park-and-Ride spaces
 - Potential route adjustments to provide additional stops within the site if necessary
 - Maintain 10 minute headway on NS Route



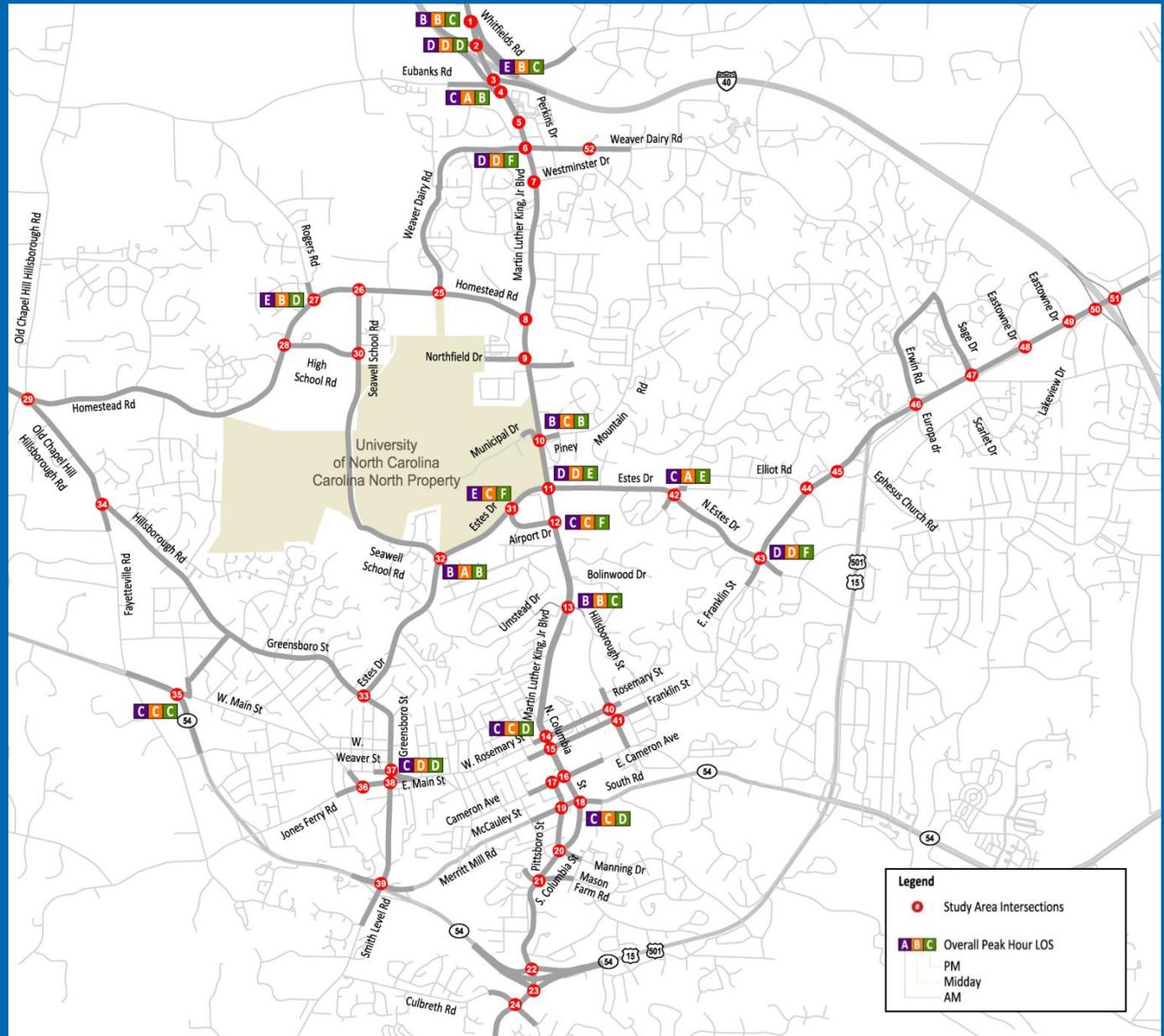
TRANSPORTATION IMPACT ANALYSIS CAROLINA NORTH DEVELOPMENT

Question and Comments



2015 No-Build Intersection Levels-of-Service

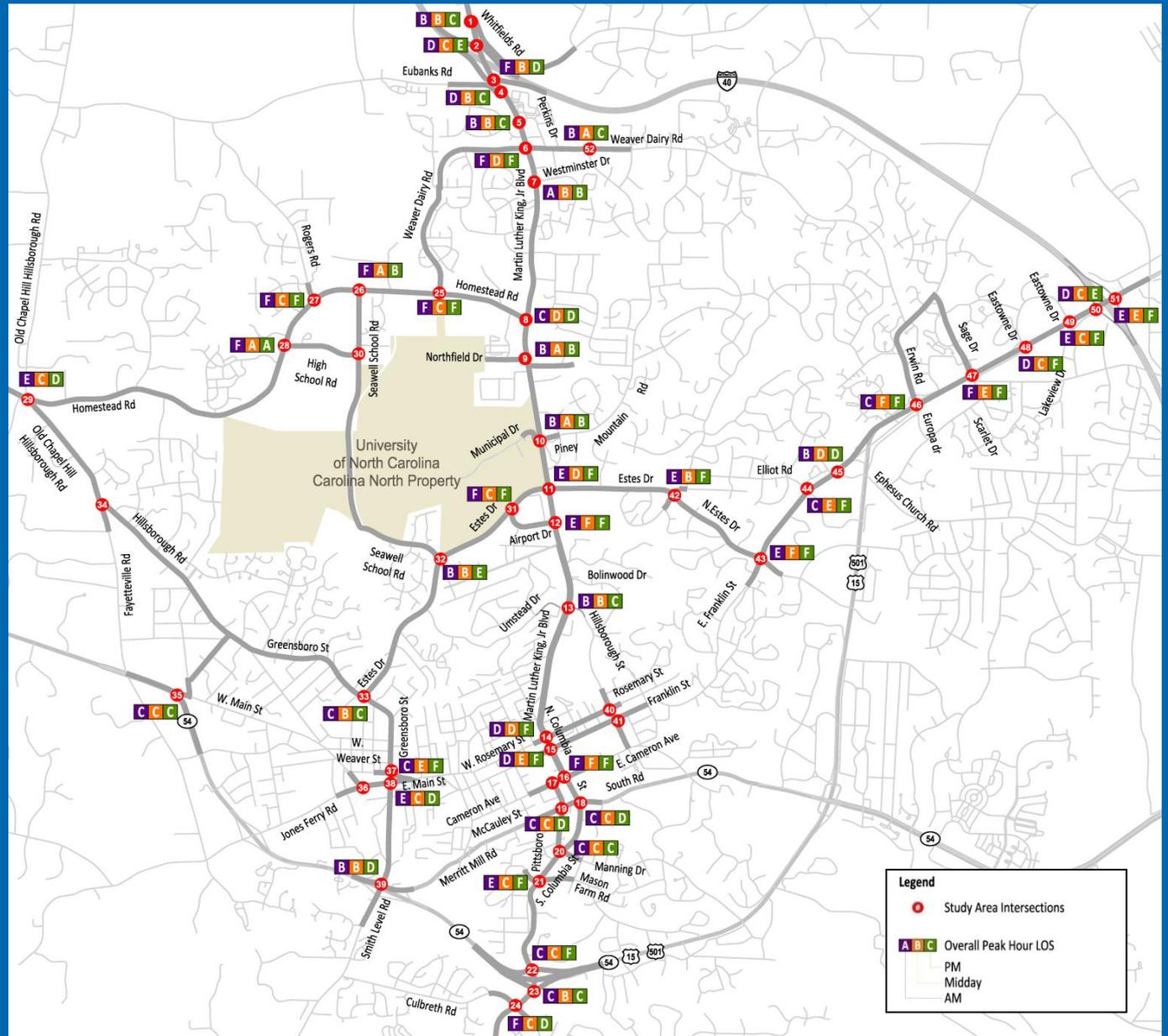
Signalized Intersection Delay	Unsignalized Intersection Delay	LOS
≤10 sec	≤10 sec	A
10-20 sec	10-15 sec	B
20-35 sec	15-25 sec	C
35-55 sec	25-35 sec	D
55-80 sec	35-50 sec	E
≥80 sec	≥50 sec	F





2030 No-Build Intersection Levels-of-Service

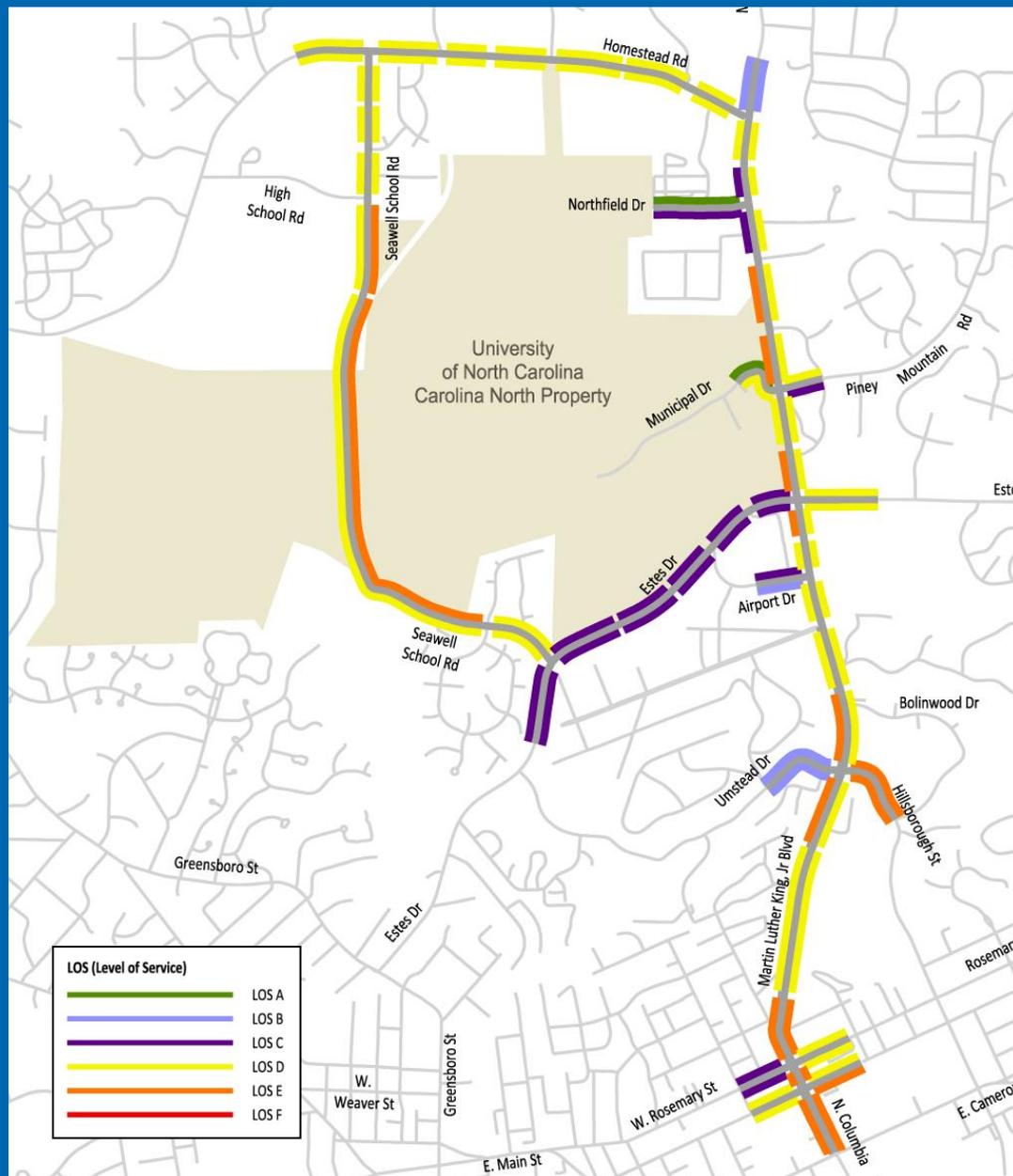
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≥80 sec	≥50 sec	F





2015 No-Build Bicycle Levels-of- Service*

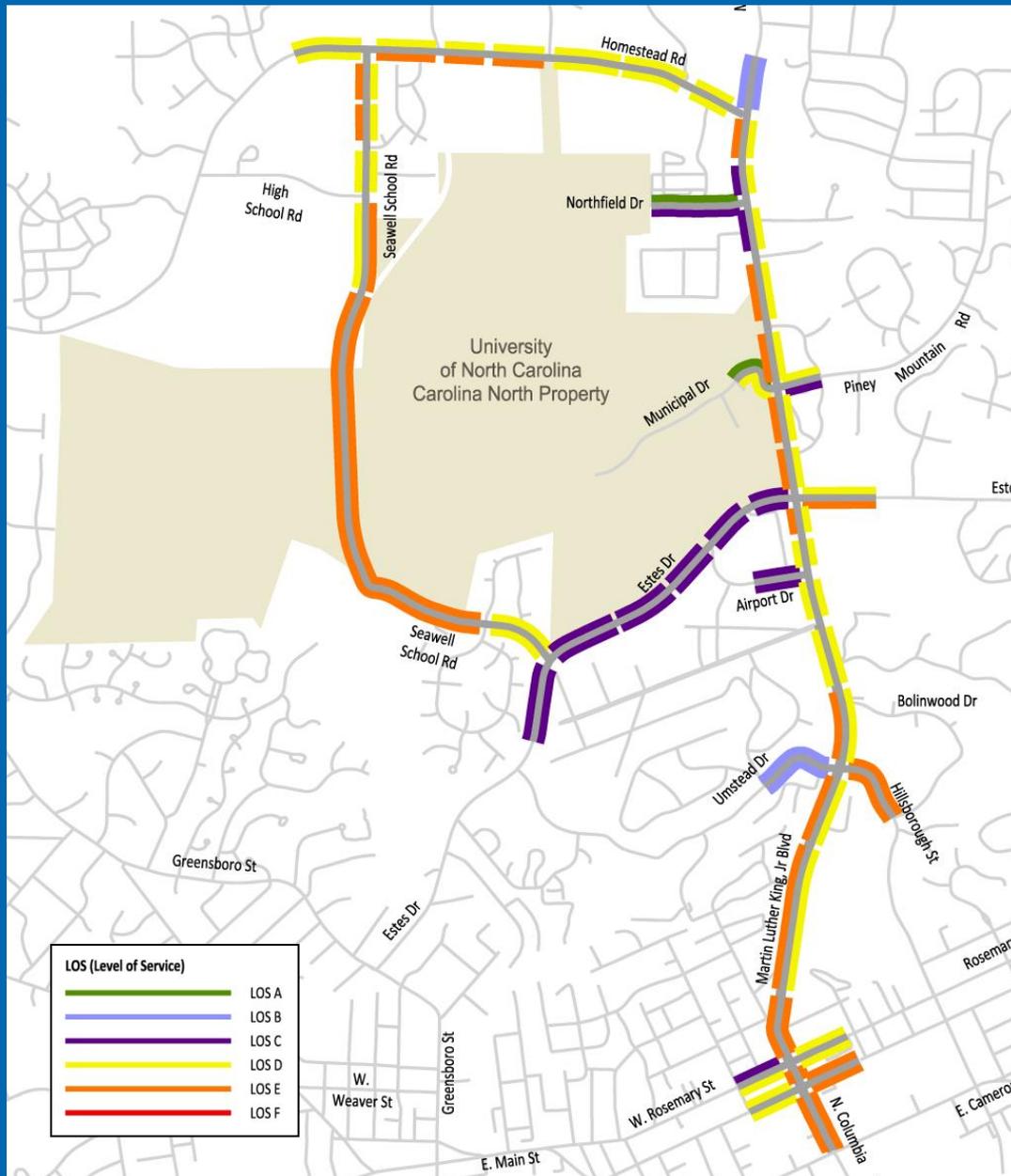
*Bicycle LOS analysis was performed in accordance with the Transportation Research Board's *Multimodal Level of Service Analysis for Urban Streets (NCHRP Report 616)*





2030 No-Build Bicycle Levels-of- Service*

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Transit Ridership Comparison

