



I-440 AT RIDGE ROAD/CRABTREE VALLEY AVENUE INTERCHANGE

WAKE COUNTY

STIP PROJECT No. I-5870

WBS No. 6307.1.1



TRAFFIC FORECAST REPORT



PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

PREPARED BY:
PATRIOT TRANSPORTATION ENGINEERING, PLLC



MAY 2018

- A79a, STIP I-5870 – Crabtree Valley Ave / I-440 Connector – New roadway from I-440 to Blue Ridge Rd
- A79b, STIP I-5870 – Crabtree Valley Ave Widening/Realign – New roadway and widening from Blue Ridge Rd to Creedmoor Rd

Additionally, the following additional projects that may affect the proposed project are included in the 2045 MTP and are assumed to be constructed prior to 2045:

- A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave
- A101 (2035), U-2823 – US 70 – Widening 4 lanes to 6 lanes from Lumley/Westgate Rd to Duraleigh/Millbrook Rd
- A195 (2035) – Creedmoor Rd – Widening 4 lanes to 6 lanes from Glenwood Ave to Strickland Rd
- A135 (2035) – Lead Mine Rd – Widening 3 lanes to 4 lanes from Town & Country Rd to Millbrook Rd
- A446 (2035) – Glenwood Avenue – Widening 4 lanes to 6 lanes from Womans Club Dr to Oberlin Rd
- A448 (2025) – Six Forks Rd – Widening 4 lanes to 6 lanes from Ramblewood Road to Lynn Road
- F83 (2025), I-5708 – I-440 Interchange Improvements at Wake Forest Road (SR 2000)
- F10 (2025), U-2719 – I-440 Widening – Widening 4 lanes to 6 lanes from US 1/64 to Wade Avenue
- A562 (2025), U-5936 – Wade Avenue Widening – Widening 4 lanes to 6 lanes from I-40 to I-440
- A21 (2035), no STIP – Lake Boone Trail Ext – New 4-lane roadway from Blue Ridge Rd to Edwards Mill Ext

Travel Demand Model

The Triangle Regional Model v6 (provided by ITRE on 02/01/2018 as authorized by NCDOT) was utilized as a tool in the development of the forecast to determine the Base and Future year scenario traffic volumes. The Triangle Model was developed in TransCAD (version 6 Build 9195) and was calibrated based on a base year of 2013, and has models for intermediate years of 2025 and 2035 and a future year of 2045.

Forecast Methodology

The 2017 Base Year No-Build traffic volumes and design factors were developed based upon current counts and historic AADT trend projections. The 2045 future year no-build traffic volumes generally included the development of compound annual growth rates between two model years. The compound annual growth rates were then applied to the AADT volumes from the 2017 scenario to develop initial volumes for 2045. Engineering judgment adjustments were applied as needed in finalizing the volumes to develop a balanced forecast.

The development of the 2017 and 2045 Build volumes were based partially on diversion of traffic between No-Build and Build model data and partially on the manual re-allocation of trip paths from specific origins and destinations. Passive origin-destination data collected by StreetLight Data, Inc. was utilized in determining changes in access to and from Crabtree Valley Mall.

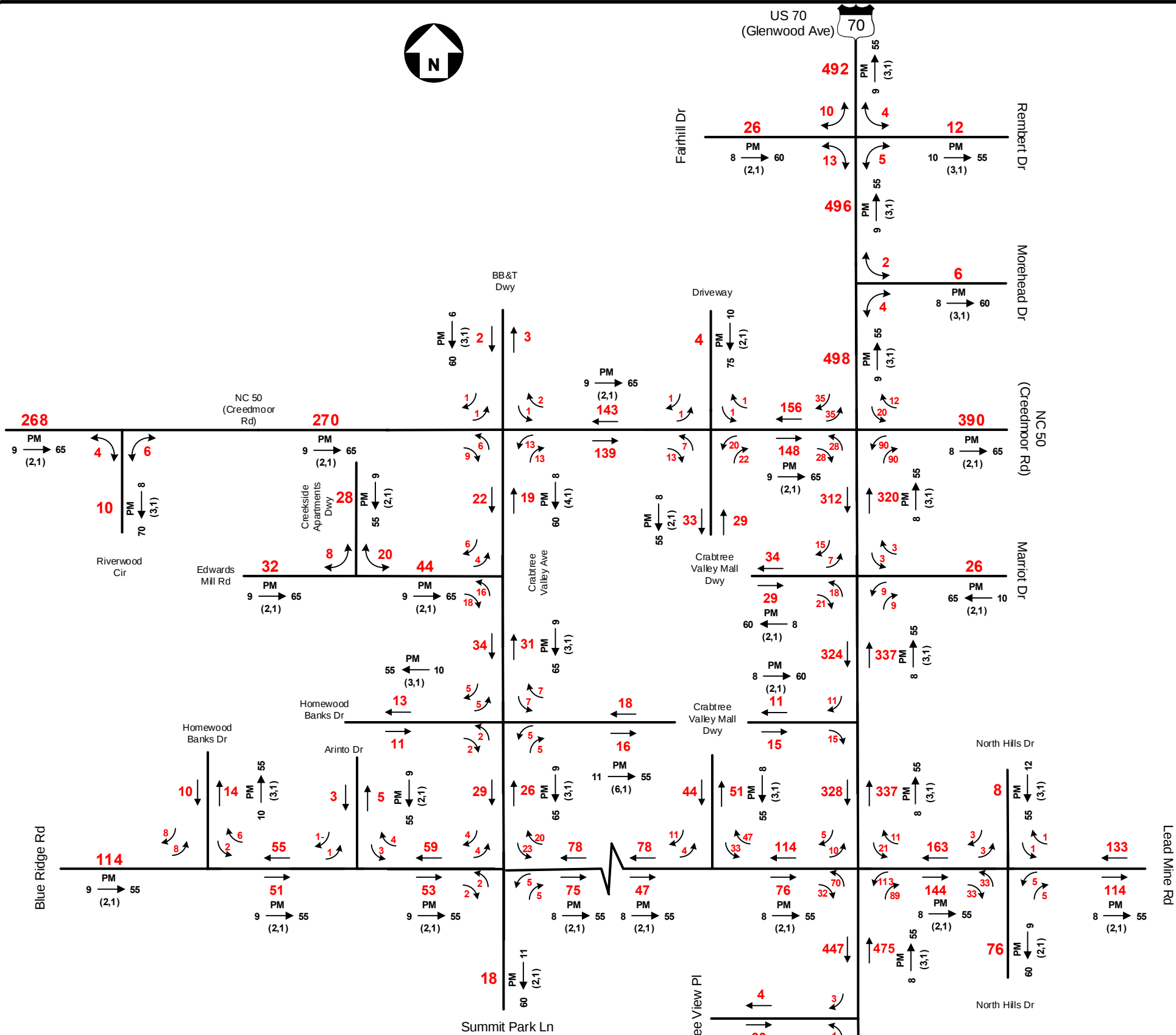
Interpolation/Extrapolation

The vicinity of the proposed project includes several large projects that will affect the capacity and traffic volumes of roadways included in this forecast. Therefore, only limited use of interpolation is permissible.

To estimate AADT volumes between 2017 and 2022 or 2040 and 2045, straight line interpolation between the 2017 Base Year and the 2045 Future Year scenarios is acceptable. Interpolation of volumes between 2023 and 2040 is not acceptable and, if needed, an interim year forecast should be developed. AADT volumes may be extrapolated for up to two years immediately following 2045. If it is determined that any of these assumptions have become inconsistent with the project and surrounding area activity, please request updated projections at this location.

This forecast has been reviewed and approved by the NCDOT Transportation Planning Division on May 29, 2018.

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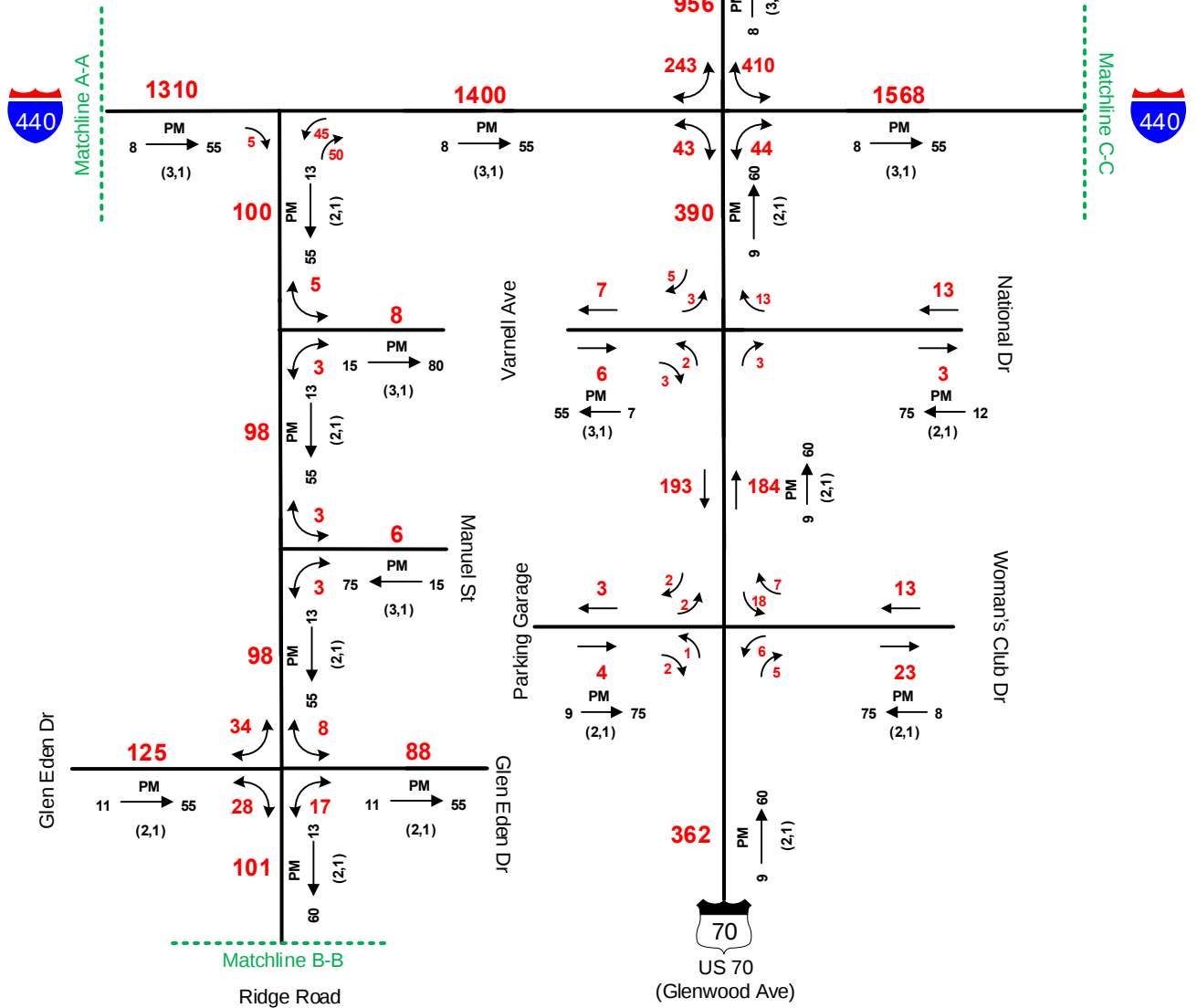
2017 AVERAGE ANNUAL DAILY TRAFFIC

NO-BUILD SCENARIO SHEET 1 OF 2

LEGEND

- ### No. of Vehicles Per Day (VPD) in 100s
- 1- Less than 50 VPD
- X Movement Prohibited
- Roadway
- K Design Hour Factor (%)
- PM PM Peak Period
- D Peak Hour Directional Split
- Indicates Direction of D
- (d,t) Duals, TT-STs (%)

TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
DATE: 05-29-2018	
PREPARED BY: Patriot Transportation Engineering, PLLC	
LOCATION: I-440 from West of Lake Boone Trail to East of Six Forks Road	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	



2017 AVERAGE ANNUAL DAILY TRAFFIC

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SHEET 2 OF 2

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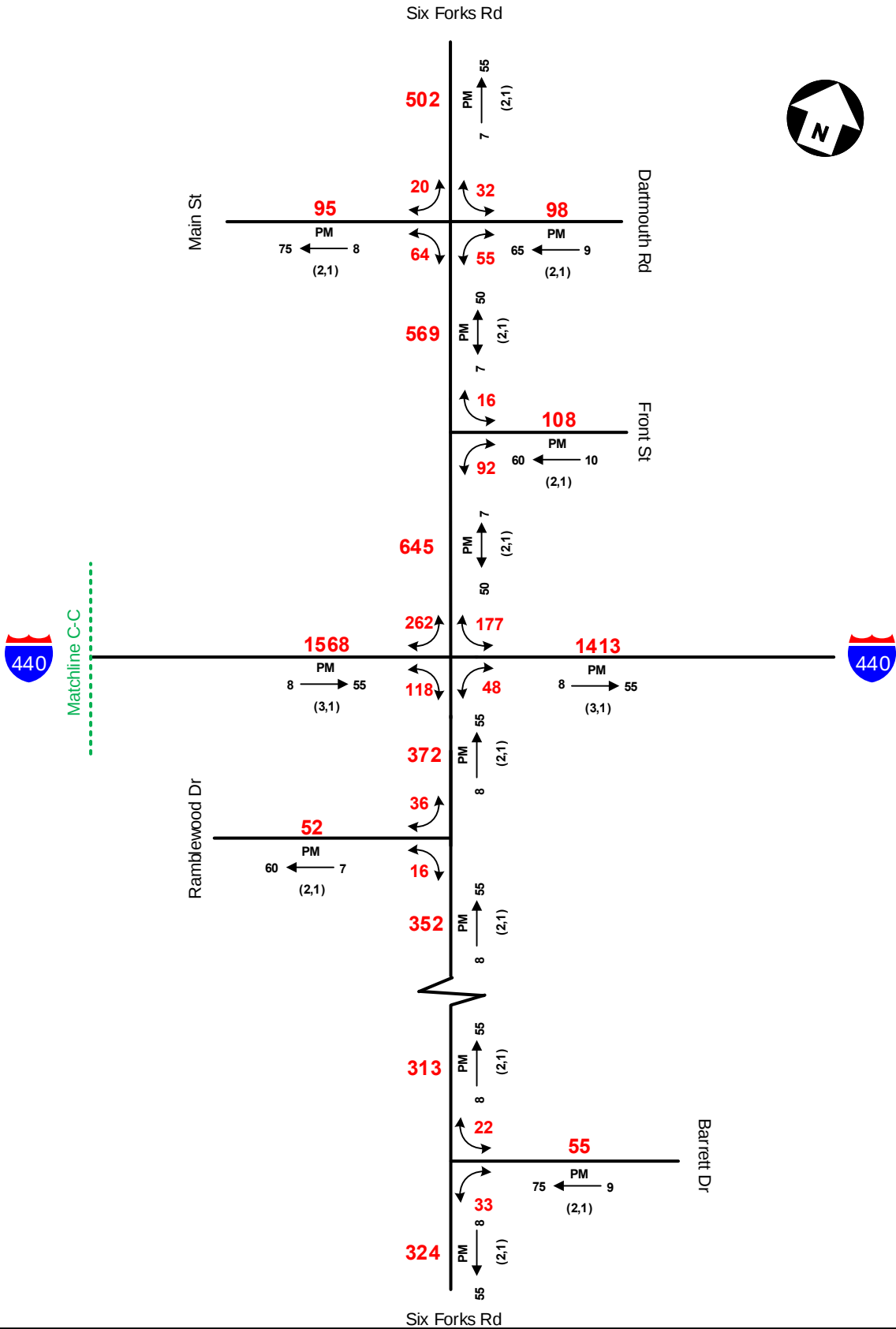
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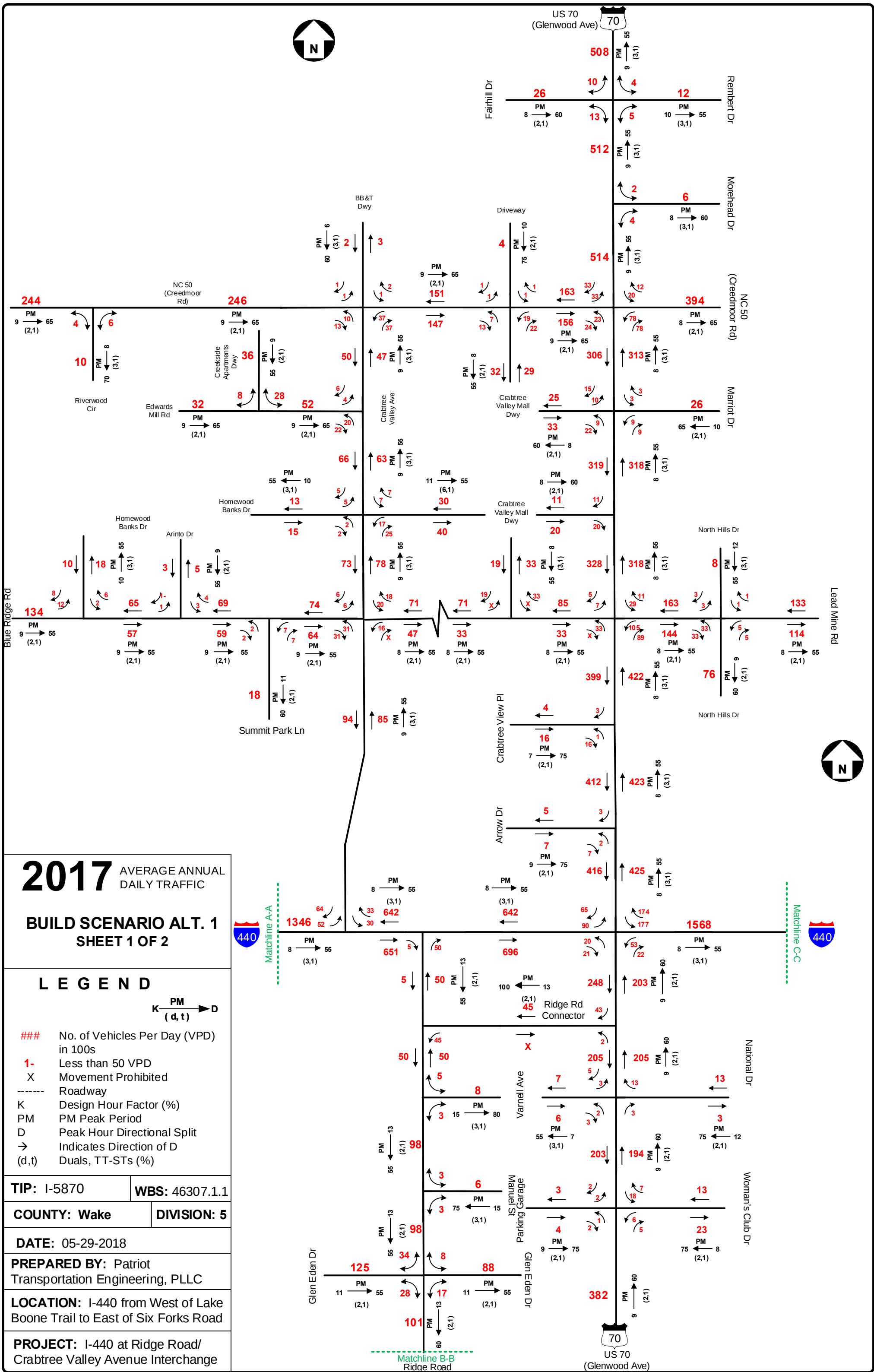
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2017 AVERAGE ANNUAL DAILY TRAFFIC

BUILD SCENARIO ALT. 1
SHEET 2 OF 2

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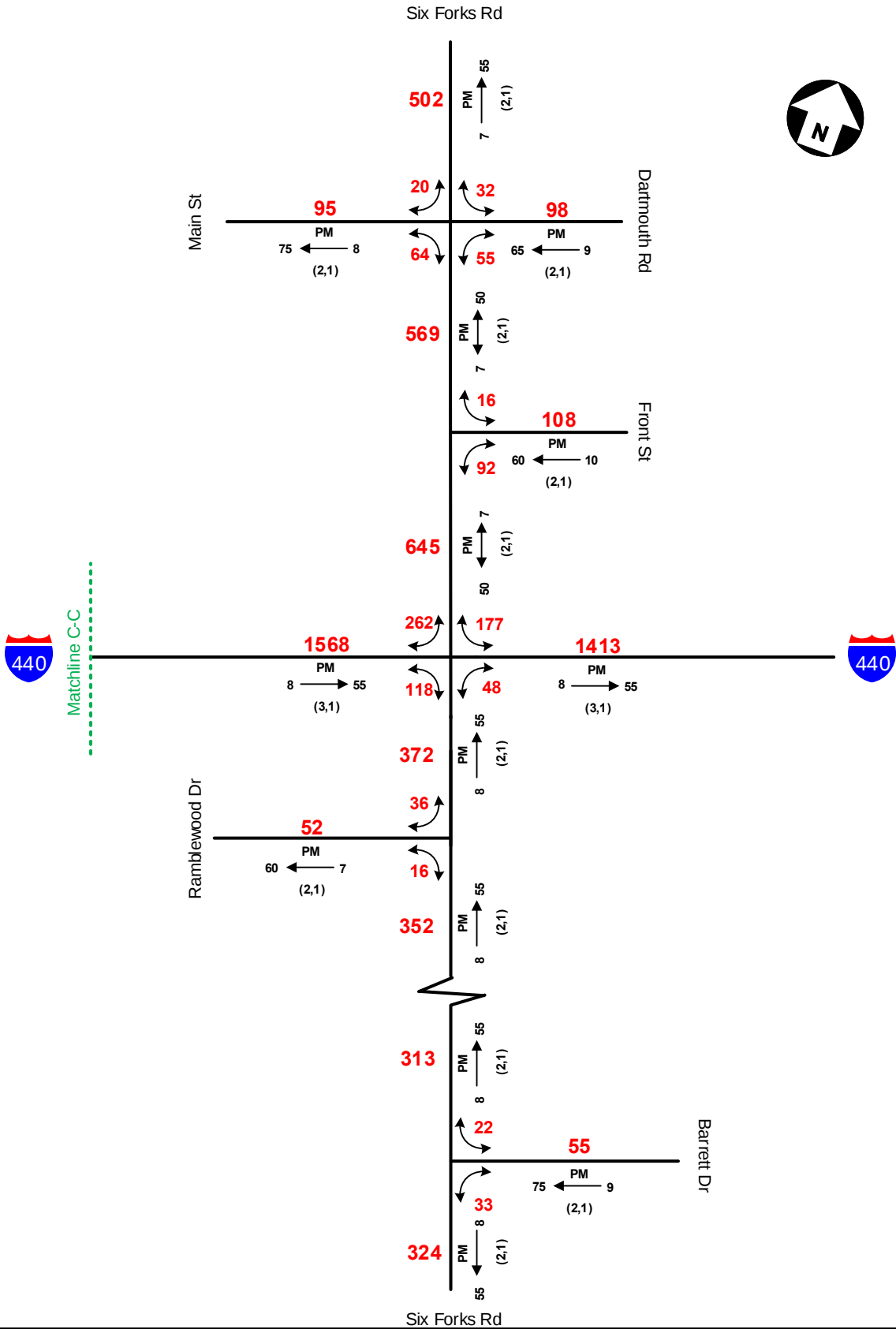
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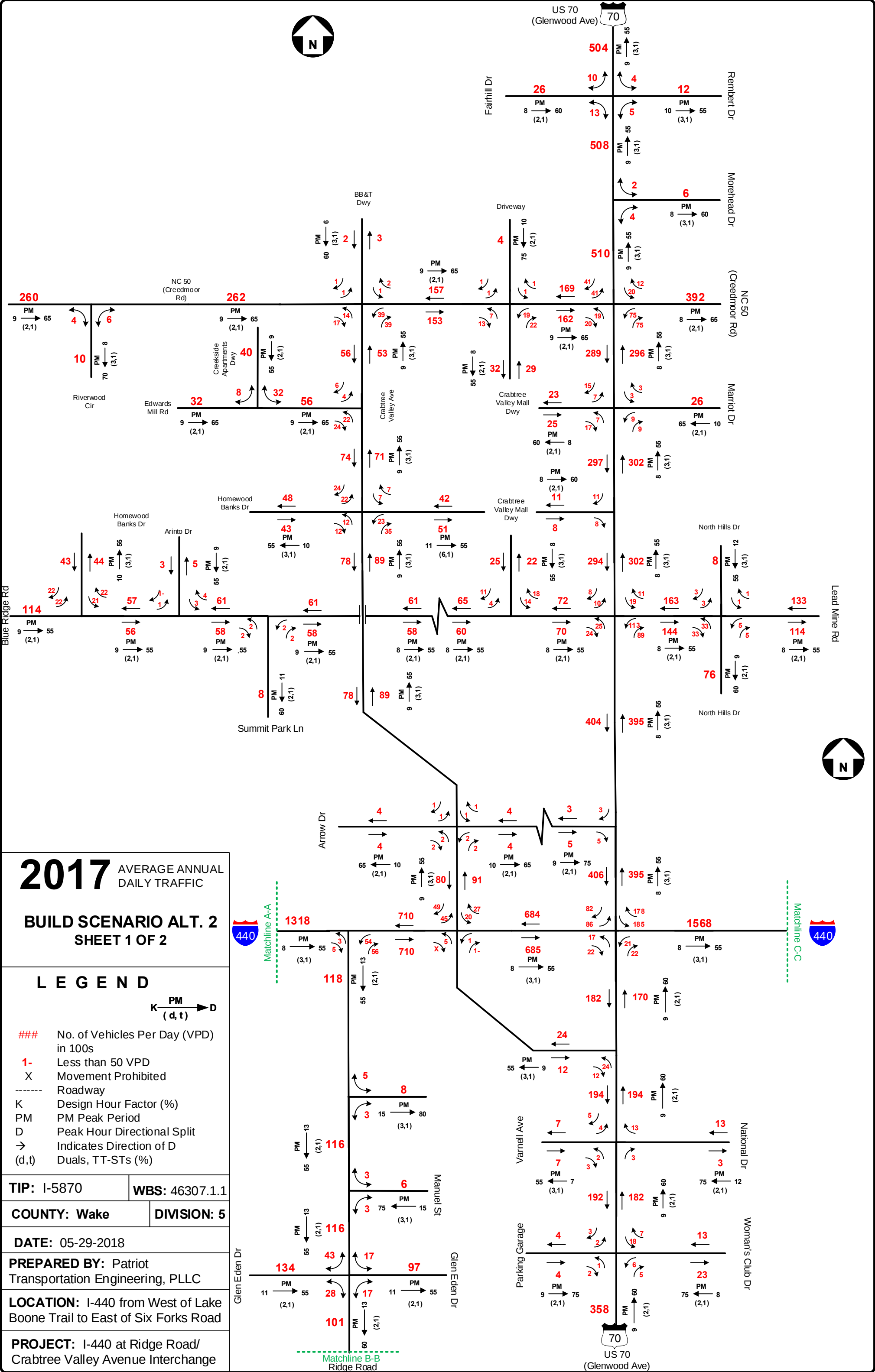
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2017 AVERAGE ANNUAL
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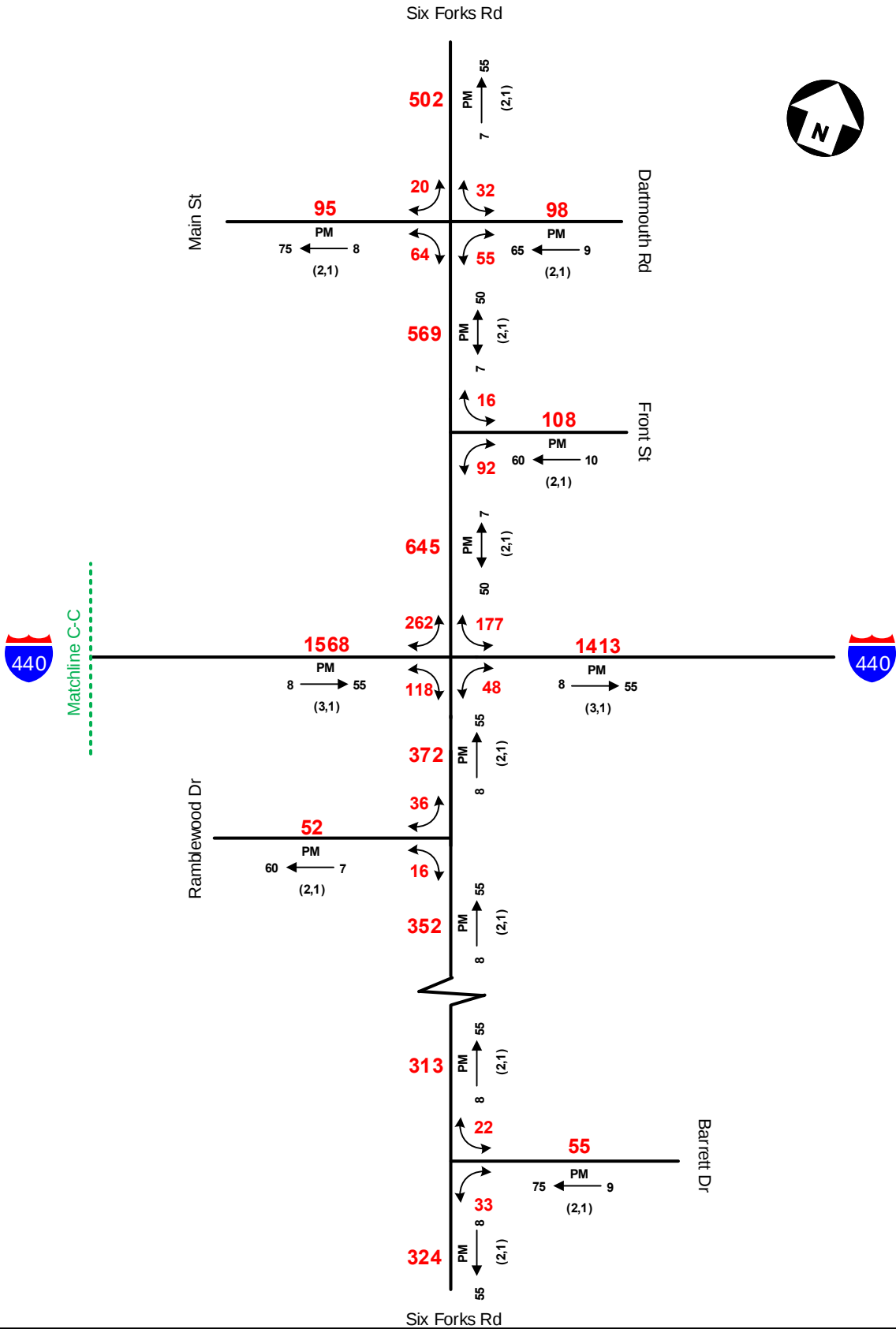
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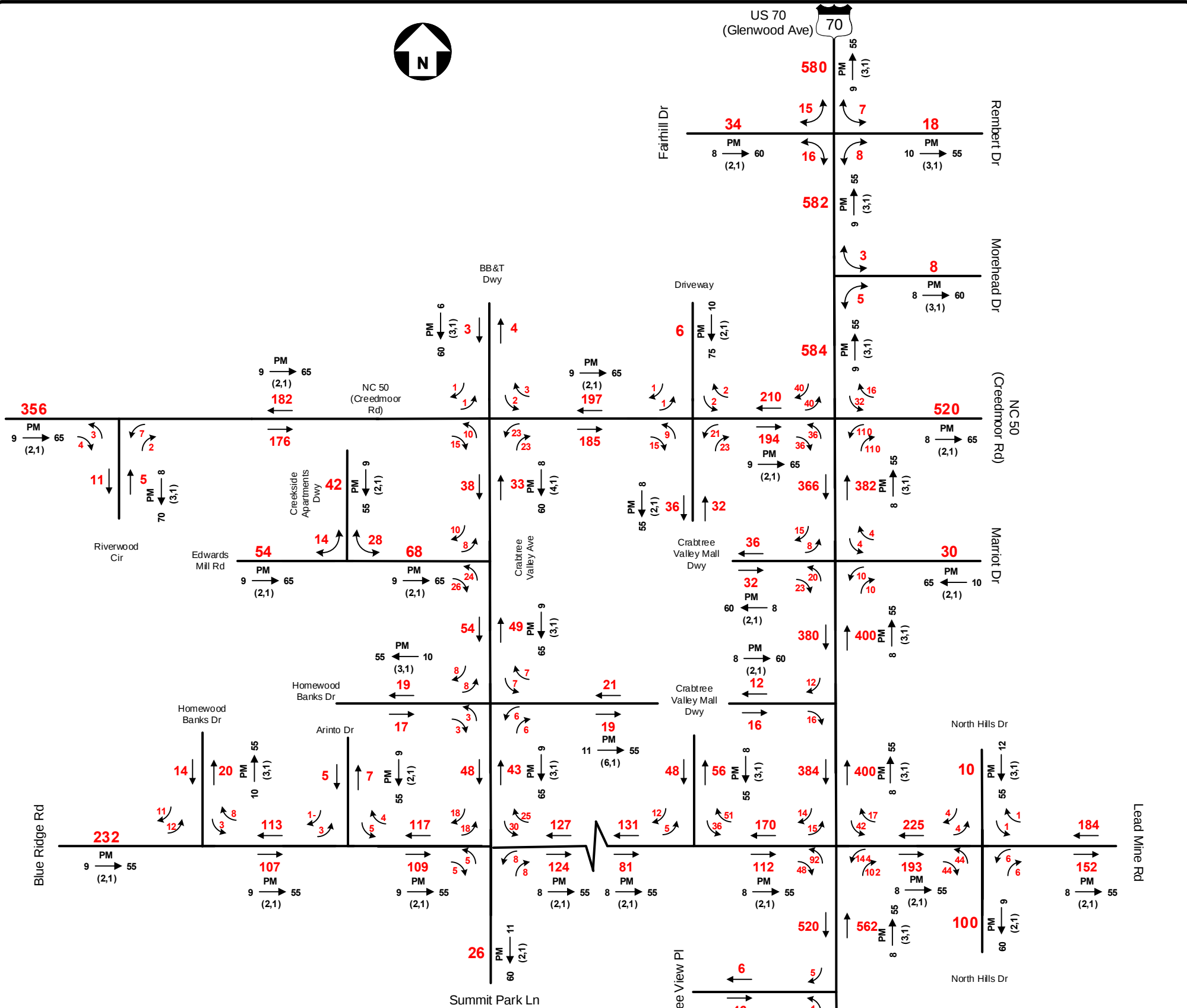
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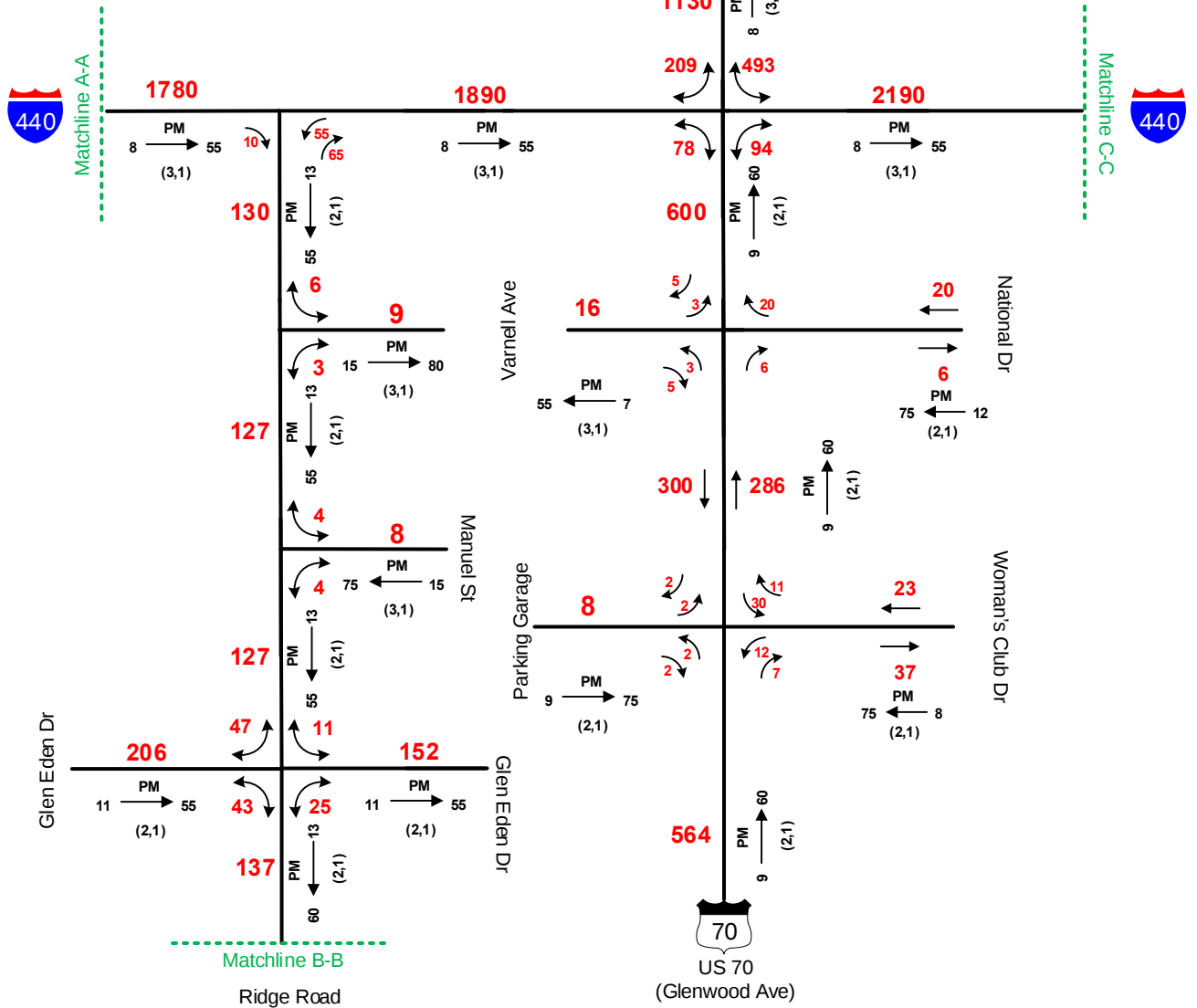
2045 AVERAGE ANNUAL DAILY TRAFFIC

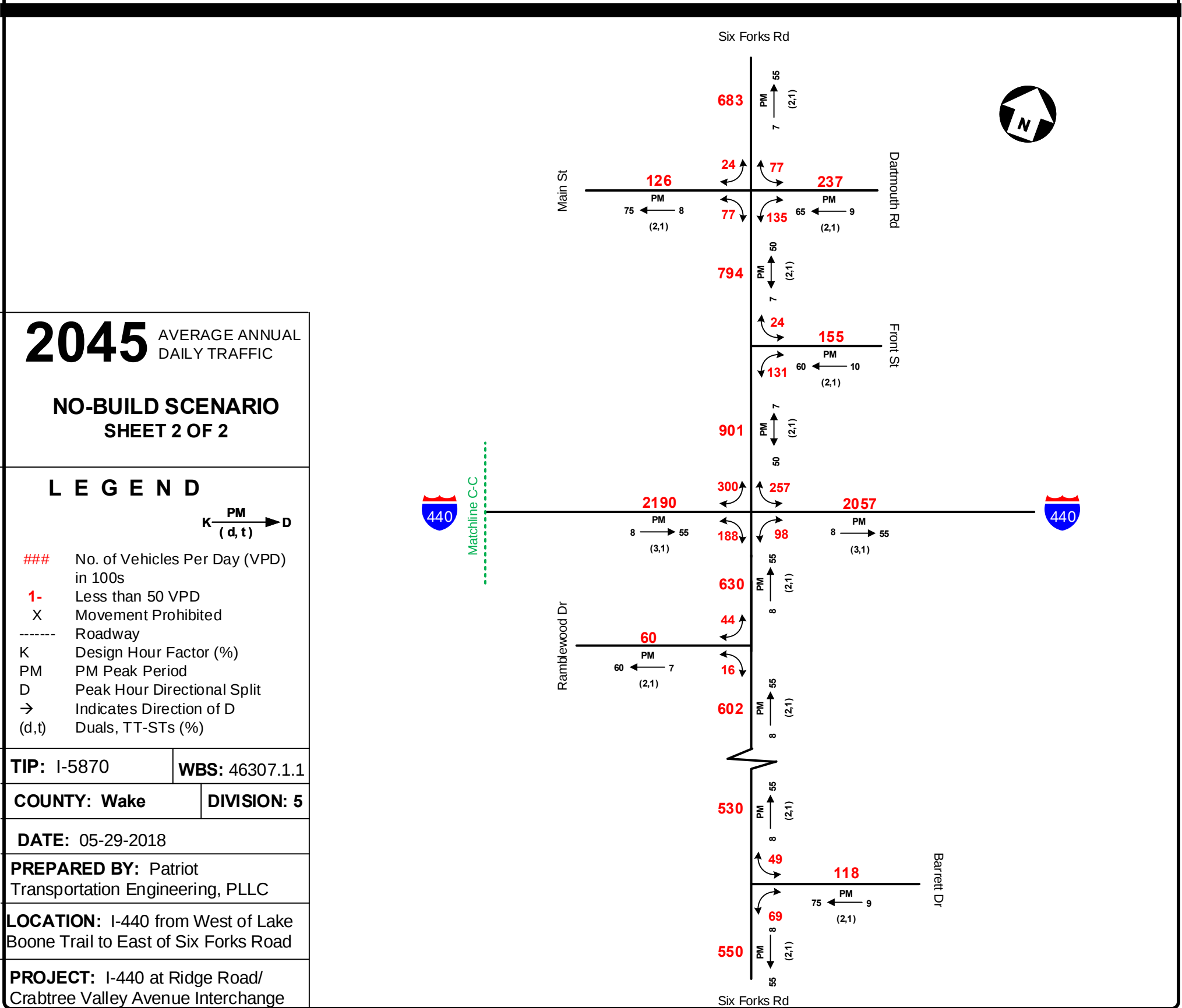
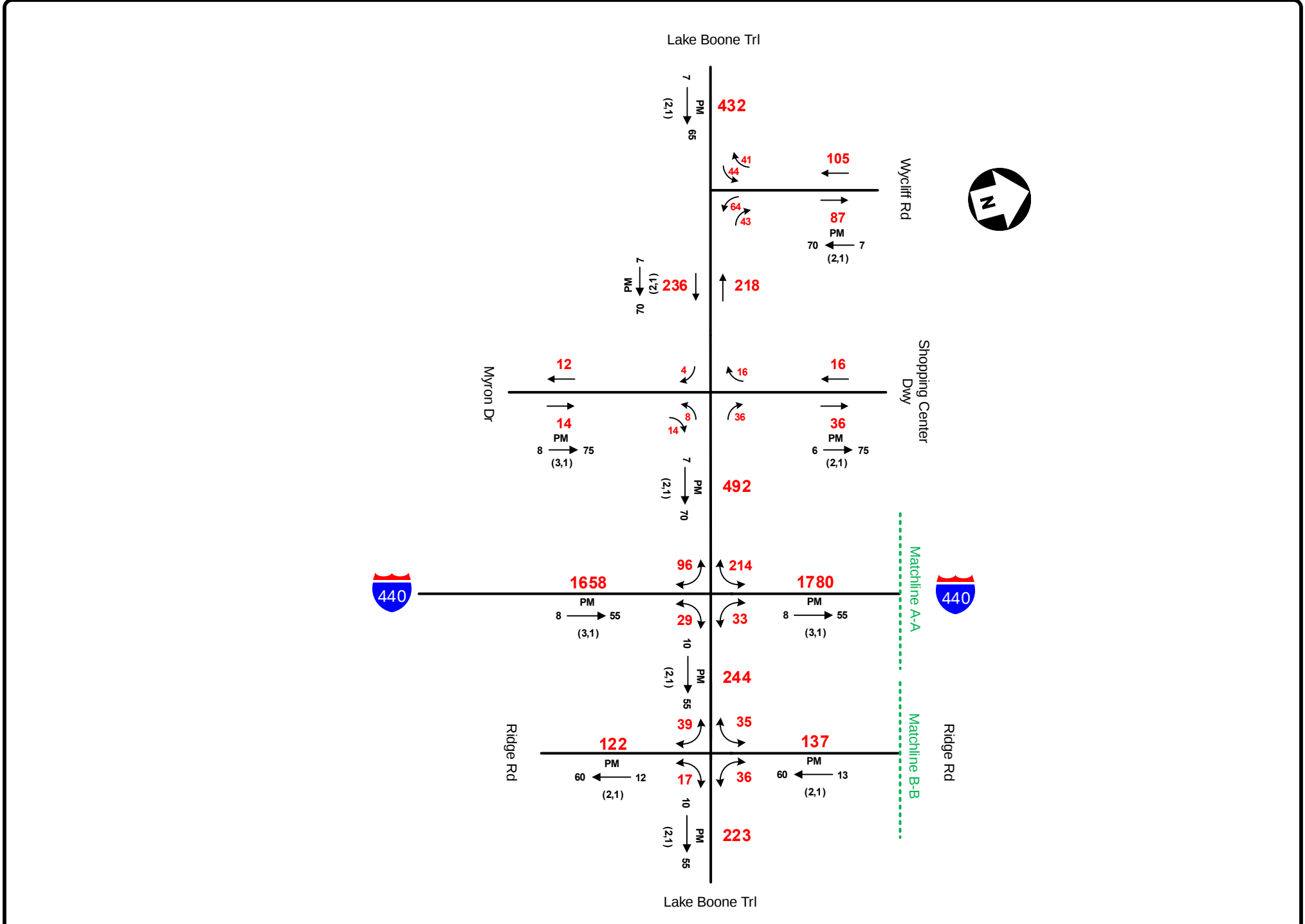
NO-BUILD SCENARIO
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2045

AVERAGE ANNUAL
DAILY TRAFFIC

NO-BUILD SCENARIO

SHEET 2 OF 2

L E G E N D

K

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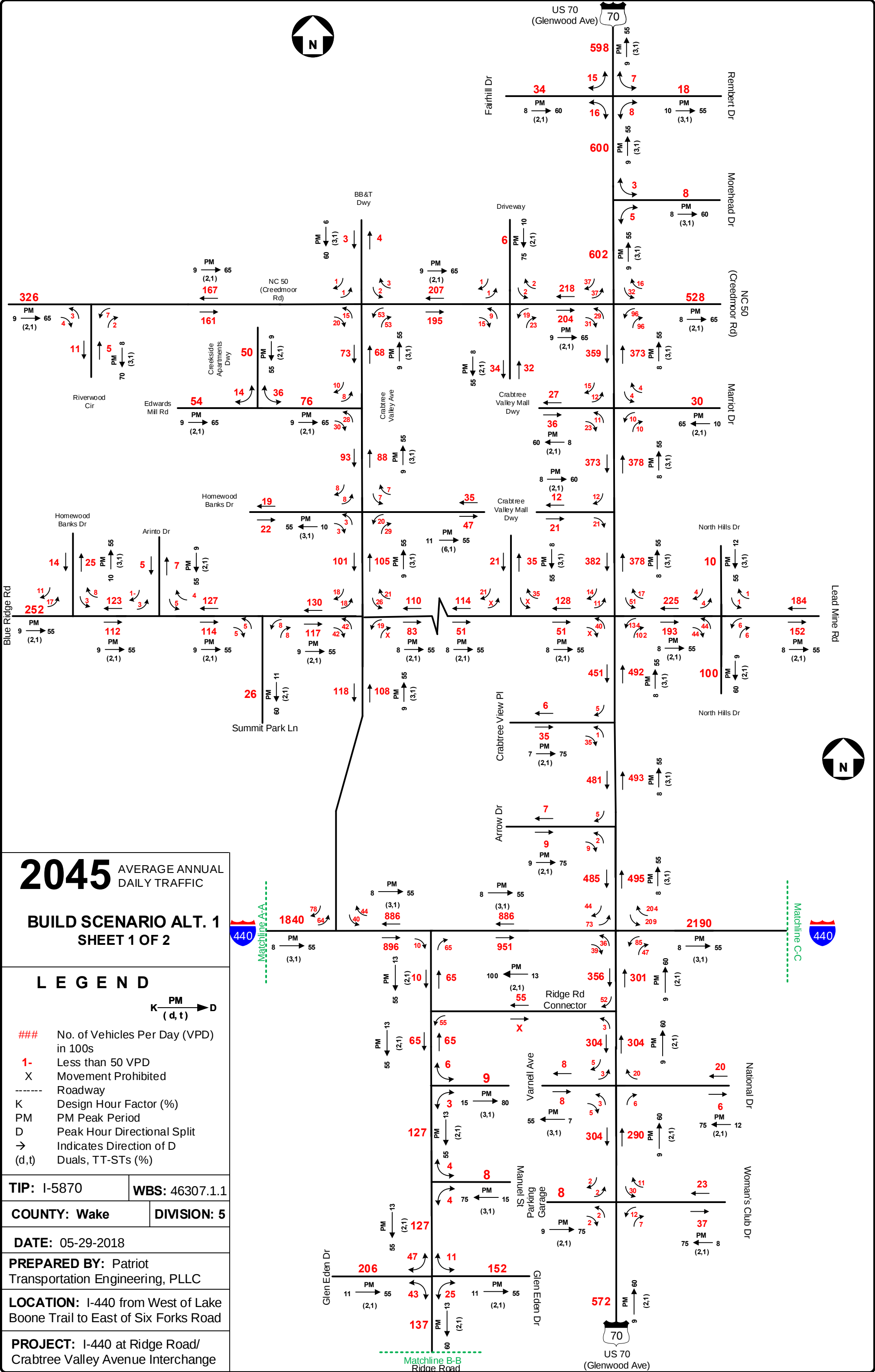
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PREPARED BY: Patriot
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PROJECT: I-440 at Ridge Road/
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2045 AVERAGE ANNUAL DAILY TRAFFIC

BUILD SCENARIO ALT. 1
SHEET 2 OF 2

LEGEND

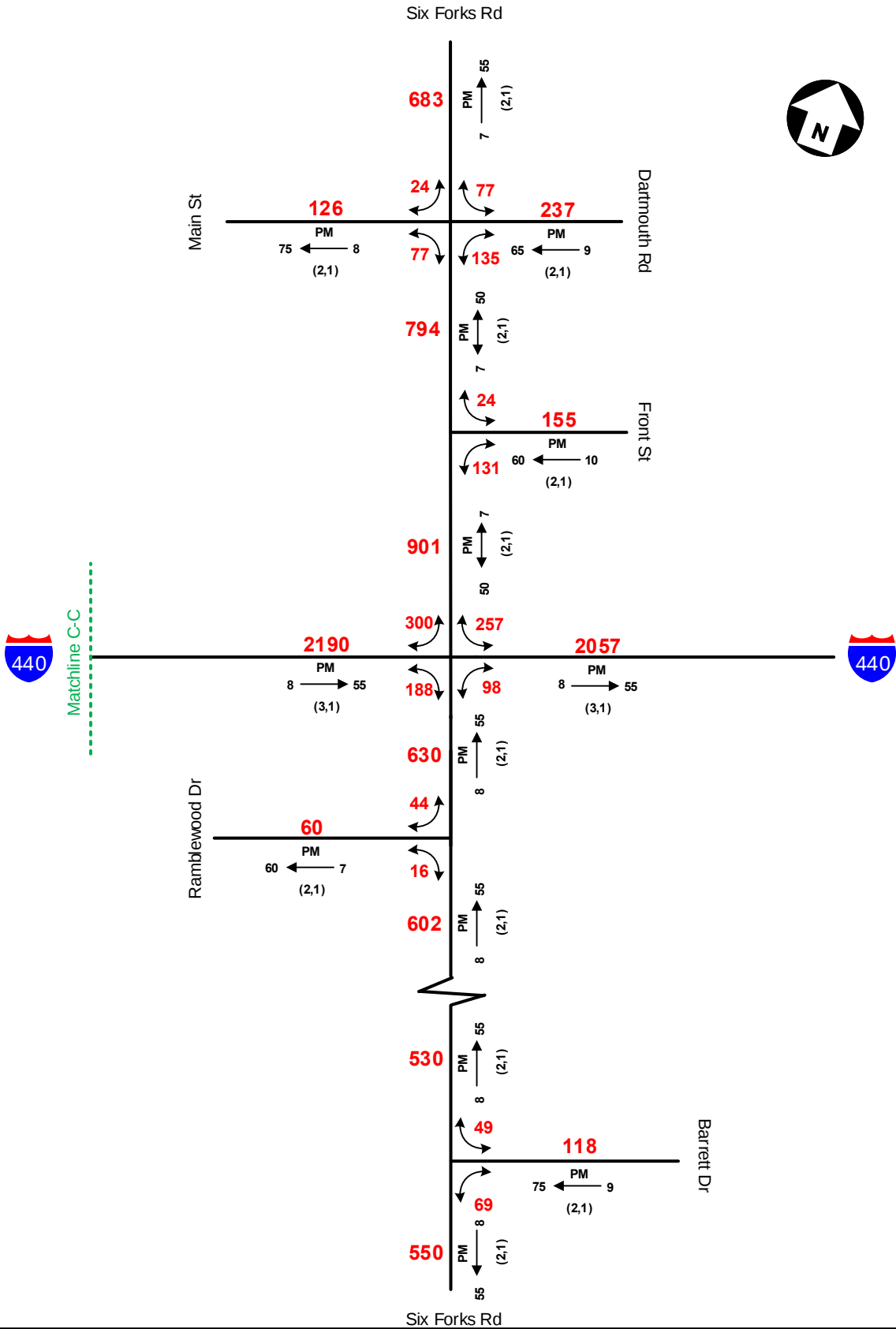
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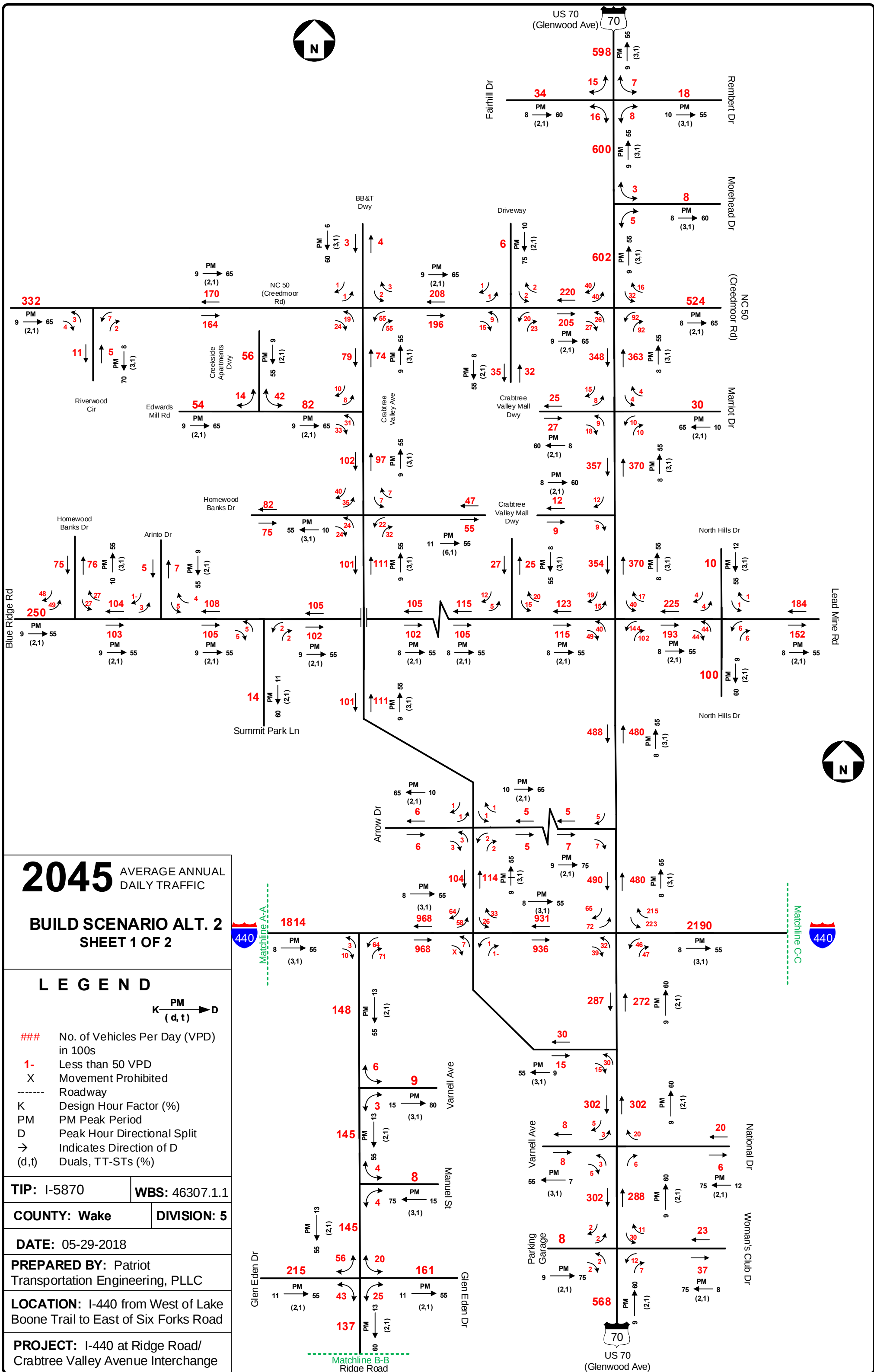
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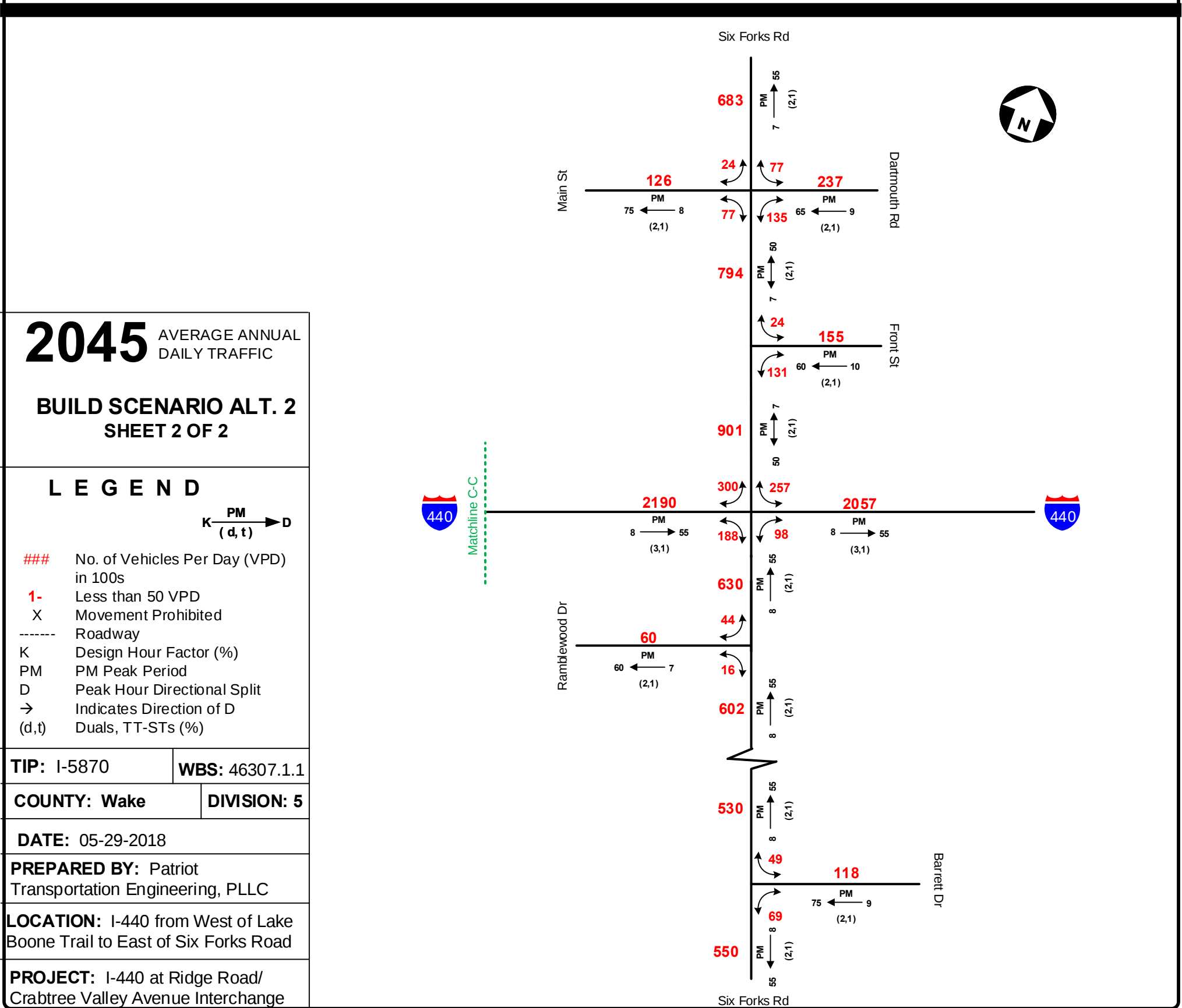
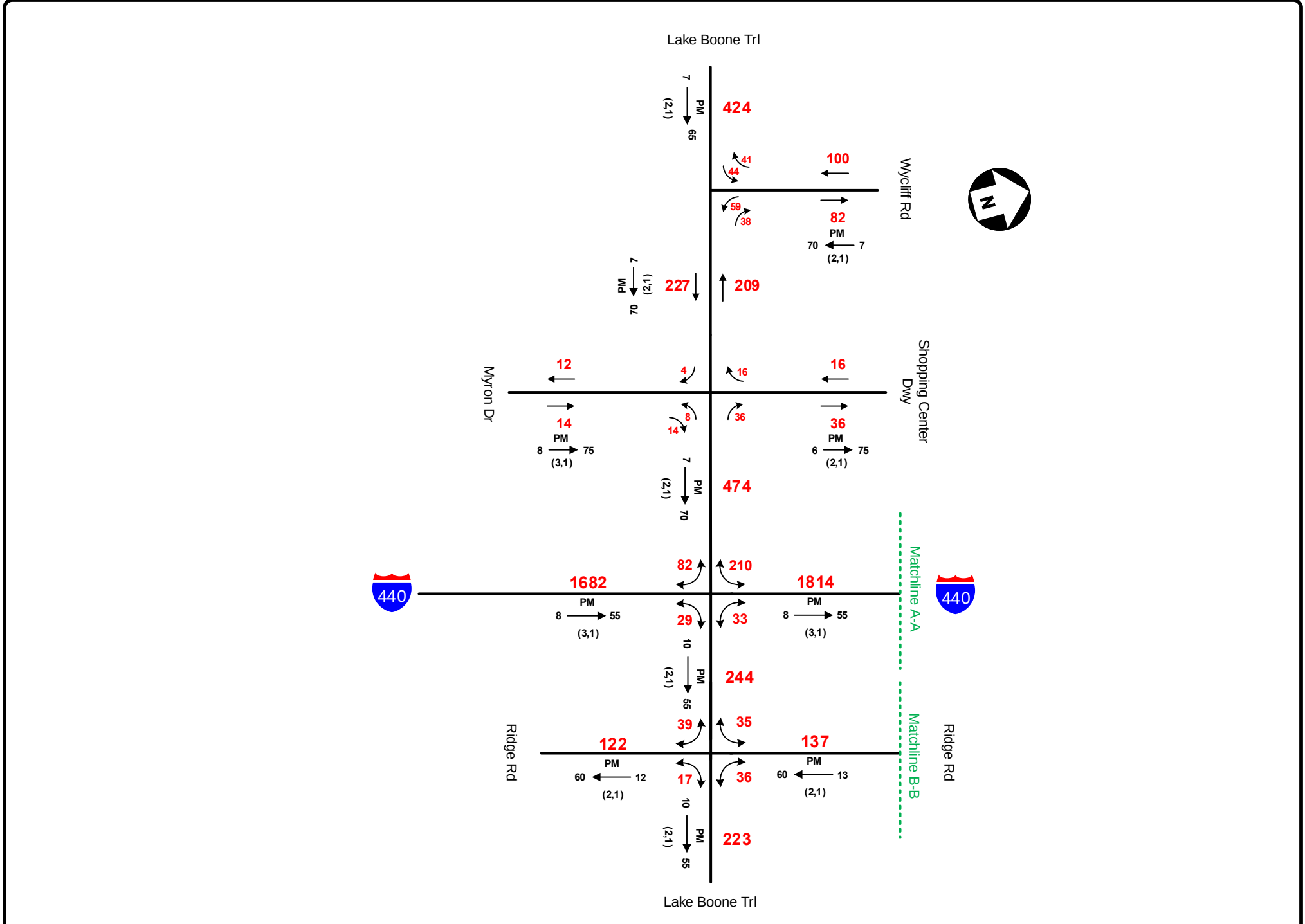
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2045

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SHEET 2 OF 2

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1. PROJECT BACKGROUND

Patriot Transportation Engineering, PLLC (Patriot) has been contracted by the North Carolina Department of Transportation (NCDOT) to develop base and future year traffic forecasts for NCDOT State Transportation Improvement Program (STIP) Project Number U-5780 in Wake County.

1.1 PROJECT REQUEST INFORMATION

The traffic forecast for this project was requested by NCDOT Division 5 in support of project development activities, including National Environmental Policy Act (NEPA) documentation and Preliminary Design for the project. The scope of work for the traffic forecast was finalized in November 2017.

For the purposes of the environmental document, it was decided through project scoping with NCDOT that Base Year scenarios would use 2017 and Future Year scenarios would use 2045. The 2017 Base Year traffic forecast includes the No-Build scenario and Build scenarios for two alternatives. The 2045 Future Year traffic forecast includes No-Build and Build scenarios for two alternatives.

1.2 FORECAST HISTORY

This is the first request for a traffic forecast at this location.

1.3 PROJECT DESCRIPTION

NCDOT proposes to new interchange on I-440 at Ridge Road to connect with Crabtree Valley Avenue and to realign and widen Crabtree Valley Avenue between Edwards Mill Road (SR 3009) and Ridge Road. The project will also modify the I-440/Glenwood Ave US 70) interchange and includes improvements to the Glenwood Avenue at Blue Ridge Road/Lead Mine Road intersection in Wake County.

1.4 AREA INFORMATION

Wake County has an estimated population of 901,000 citizens based on 2010 census data and a 2016 population of 1,026,700 according to the North Carolina Office of State Budget and Management (NCOSBM). The county covers approximately 857 square miles and consists of several cities and towns including; Raleigh, Cary, Apex, Fuquay-Varina, Garner, Holly Springs, Knightdale, Morrisville, Rolesville, Wake Forest, Wendell, and Zebulon. Raleigh-Durham International Airport (RDU) is located on the western side of the county. Raleigh is both the county seat of Wake County and the state capital of North Carolina.

The project location maps for the I-5870 forecast are shown in Figure 1-1 through Figure 1-3.

Figure 1-1: Project Vicinity Map (1)

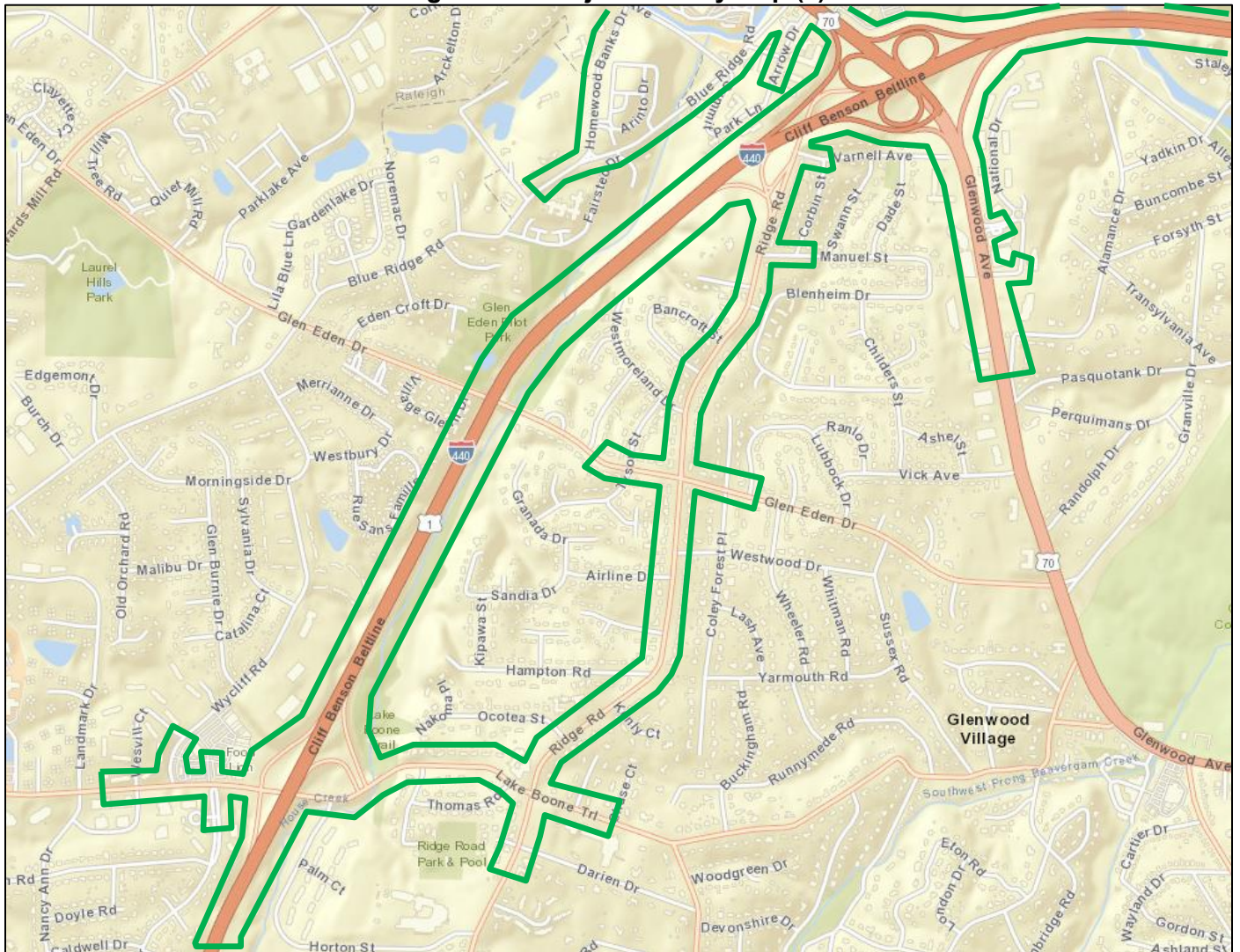


Figure 1-2: Project Vicinity Map (2)

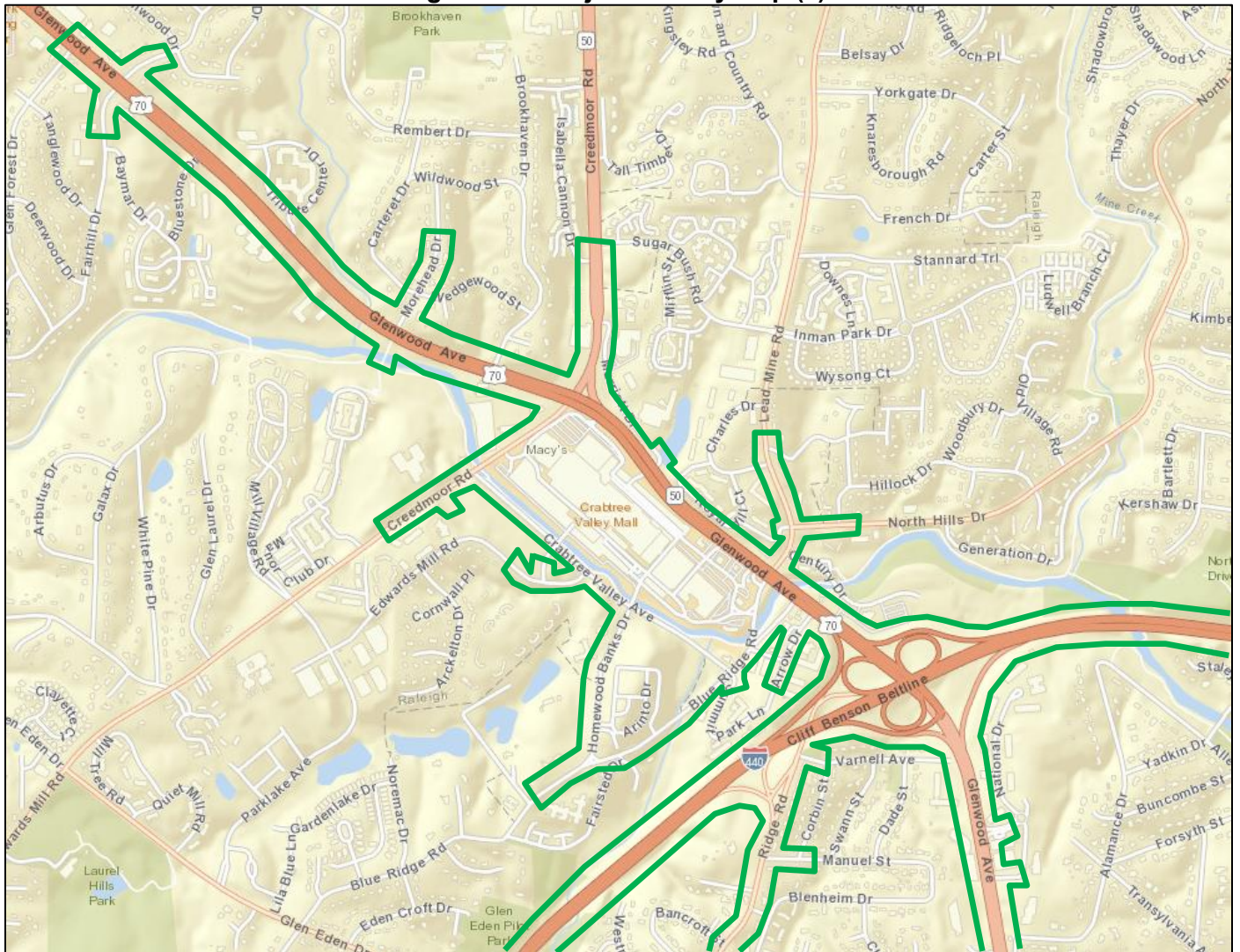
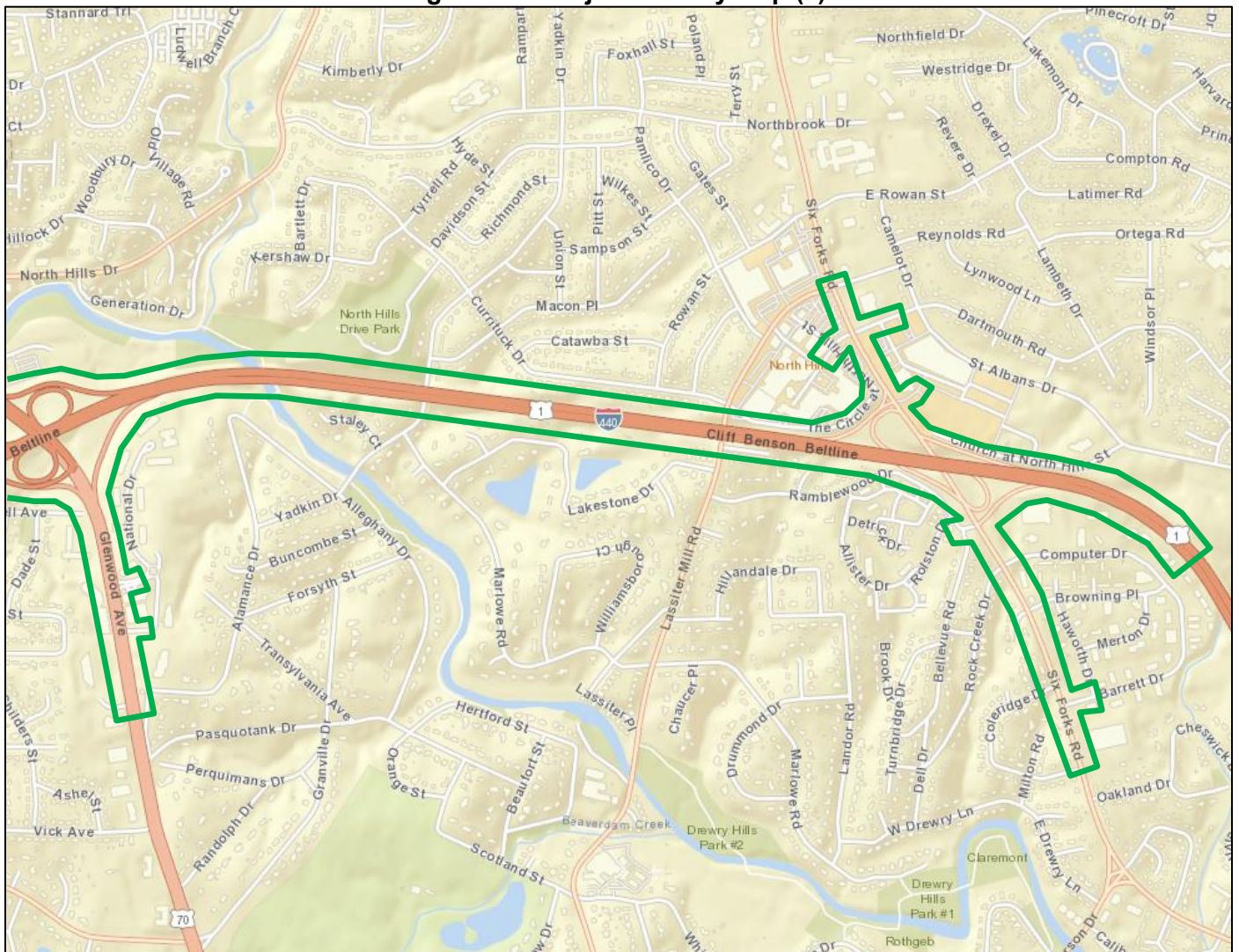


Figure 1-3: Project Vicinity Map (3)



1.5 ROUTE INFORMATION

The following roadways within the study area are classified by the Federal Highway Administration (FHWA):

Interstate 440 (I-440) is classified as an *Interstate* and, as such, has access completely controlled via interchanges. I-440 is the beltway freeway around Raleigh and is a primary facility providing connection to major roadways serving the area. I-440 is a primary route for commuter trips, non-commuter trips, and through trips alike. There are four interchanges included in the study area. The interchange at Lake Boone Trail is a full access interchange (with a diamond configuration on the outer beltline ramps and a partial cloverleaf configuration for the inner beltline ramps). The interchange at Glenwood Avenue (US 70) is a full access cloverleaf interchange (only the southeast quadrant does not include a loop off-ramp). The partial access interchange with Ridge Road is between the Lake Boone Trail and Glenwood Avenue interchanges, and the interchange ramps also provide a direct connection from southbound Glenwood Avenue. The interchange at Six Forks Road (SR 1005) is a full access partial cloverleaf. In the study area, I-440 is six lanes wide with auxiliary lanes between Glenwood Avenue and Six Forks Road and between Six Forks Road and the next interchange to the east (Wake Forest Road). The speed limit along I-440 in the study area is 60 mph.

Lake Boone Trail is designated as a *Major Collector* within the study area and provides connection to Blue Ridge Road to the west and residential areas to the east. The speed limit along Lake Boone Trail is 45 mph west of Wycliff Road and 35 mph east of Wycliff Road. Rex Hospital is located on Blue Ridge Road, just to the northwest of the study area.

Ridge Road is designated as a *Major Collector* within the study area and provides access to primarily residential areas south of I-440. The speed limit along Ridge Road is 35 mph.

Glenwood Avenue (US 70) is designated as an *Other Principal Arterial* and provides access to major commercial areas and some high-intensity residential areas within the study area. The speed limit along Glenwood Avenue is 45 mph. Crabtree Valley Mall is located on Glenwood Avenue, north of I-440. Glenwood Avenue provides direct access to Crabtree Valley Mall at several locations.

Six Forks Road (SR 1005) is designated as a *Minor Arterial* within the study area. The speed limit along Six Forks Road is 35 mph north of I-440 and 40 mph south of I-440. The North Hills commercial/retail mixed-use development is located off of Six Forks Road to the north of I-440. St. Timothy's School and Carroll Middle School are located on Six Forks Road to the north of the study area.

The **Creedmoor Road (NC 50/SR 3009)** is designated as a *Minor Arterial* within the study area. Creedmoor Road is also designated as NC 50 northeast of Glenwood Avenue and SR 3009 southwest of Glenwood Avenue. The speed limit along Creedmoor Road is 45 mph. Direct access to the Crabtree Valley Mall is provided via Creedmoor Road. Stough Elementary School is located on Creedmoor Road to the southwest of the study area.

Blue Ridge Road (SR 1670) is designated as a *Major Collector* within the study area. The speed limit along Blue Ridge Road is 35 mph. Direct access to the Crabtree Valley Mall is provided via Blue Ridge Road.

Lead Mine Road (SR 1820) is designated as a *Major Collector* within the study area. The speed limit along Lead Mine Road is 45 mph.

Glen Eden Drive is designated as a *Major Collector* within the study area. The speed limit along Glen Eden Drive is 35 mph.

All other roadways included in the project forecast are classified as *Local Roads*.

1.6 FUTURE AREA ROADWAY IMPROVEMENTS – FISCAL CONSTRAINT

The project is located within the Capital Area Metropolitan Planning Organization (CAMPO) boundaries; therefore, the travel demand model and traffic forecast is fiscally constrained to match the assumptions of the corresponding Metropolitan Transportation Plan (MTP).

The *Connect 2045 – The Metropolitan Transportation Plan* (2045 MTP) includes the proposed project within the 2035 horizon year of roadway projects and describes it as follows:

- A79a, STIP I-5870 – Crabtree Valley Ave / I-440 Connector – New roadway from I-440 to Blue Ridge Rd
- A79b, STIP I-5870 – Crabtree Valley Ave Widening/Realign – New roadway and widening from Blue Ridge Rd to Creedmoor Rd

It should be noted that two different alternatives are being considered for the design of the proposed project(s).

Additionally, the following additional projects that may affect the proposed project are included in the 2045 MTP and is assumed to be constructed prior to 2045:

- A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave

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2. SOURCES OF INFORMATION AND DATA

The following sections describe the various information and data sources used in the development of the traffic forecast.

2.1 RELATED FORECASTS

Past traffic forecasts in the vicinity of the proposed project can potentially be utilized as a tool when preparing the traffic forecast. The eastern end of the forecast study area overlaps with a portion of the previous traffic forecast for I-5708 (I-440/Wake Forest Rd Interchange Improvements Traffic Forecast Amendment), performed in 2017. The western end of the forecast study area overlaps with a portion of the previous traffic forecast for U-2719 (I-440 Widening from Walnut St to Wade Ave), performed in 2012 and updated in 2017.

2.2 HISTORIC AADT

Existing traffic count data for study area roadways from 1997 to 2016 was provided by the NCDOT Traffic Survey Group (TSG). Data sources included:

- NCDOT TSG Average Annual Daily Traffic (AADT) history from 1997 to 2016

The locations of the historic traffic data counts referenced for this study are shown in

Figure 2-1 . The complete 20-year AADT history for each location is found in Appendix A.

2.3 FIELD DATA COLLECTION

New project-specific counts were taken in November 2017 through the NCDOT TSG on-call contract and included thirty-five 13-hour turning movement counts, four 14-hour manual classification count, and two 24-hour turning movement counts. The individual I-440 interchange ramp locations were counted separately, but the interchanges themselves were analyzed as single locations. The traffic count locations are listed in Table 2-1 and are displayed in Figure 2-1 through Figure 2-3.

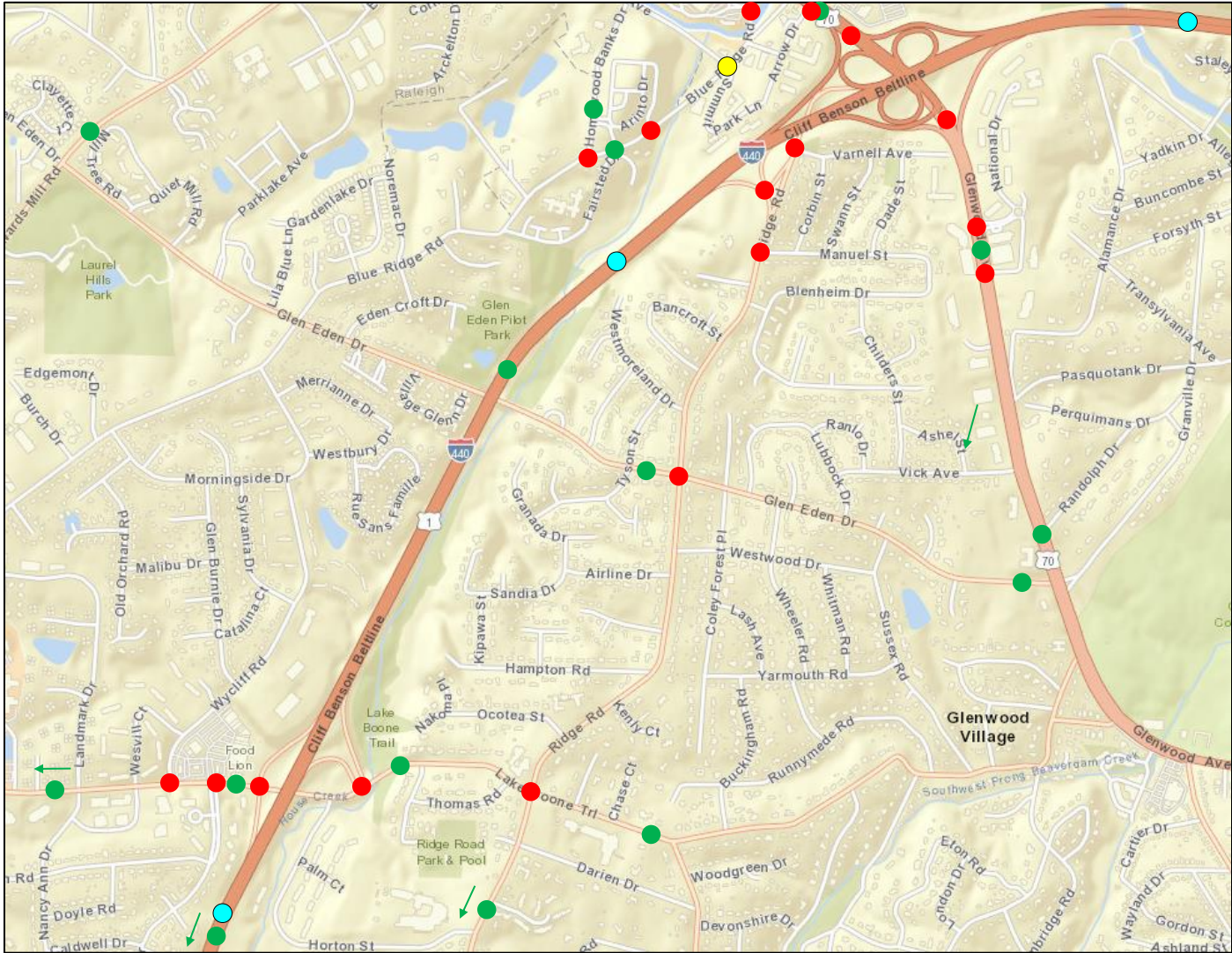
A request was made to NCDOT TSG to determine the ATR groups for the study roadways that would conform to those used by TSG. According to that correspondence, the traffic count locations fall under the following TSG ATR classifications:

- ATR Group 1 (Non-Interstate Group) – The most dominant group in the State. Mostly rural in nature and is predominantly used for count locations on nonurban primary routes and all rural and most urban secondary roads.
- ATR Group 4 (Non-Interstate Group) – Predominantly found in areas where land use is characterized as urban, with dense, mixed development. Factors from this group are predominantly applied to urban primary routes and higher volume secondary and local routes in large urban areas.
- ATR Group 11 (Interstate Group) – Applies to urban interstate and some rural locations strongly influenced by nearby large urban areas.

The 48-hour classification count was converted to 24-Hour volumes by dividing the 48-Hour counts by two and then applying the correct seasonal adjustment factors. The turning movement counts (TMCs) were converted to 24-Hour volumes by utilizing the NCDOT Traffic Survey Partial Weekday Count Expansion Factors (November 2015). The manual classification counts (MCC) were converted to 24-Hour volumes by utilizing an expansion factor derived from 48-hour Volume, Speed and Class (VSC) counts taken by NCDOT in September 2014. The NCDOT TSG expansion factor

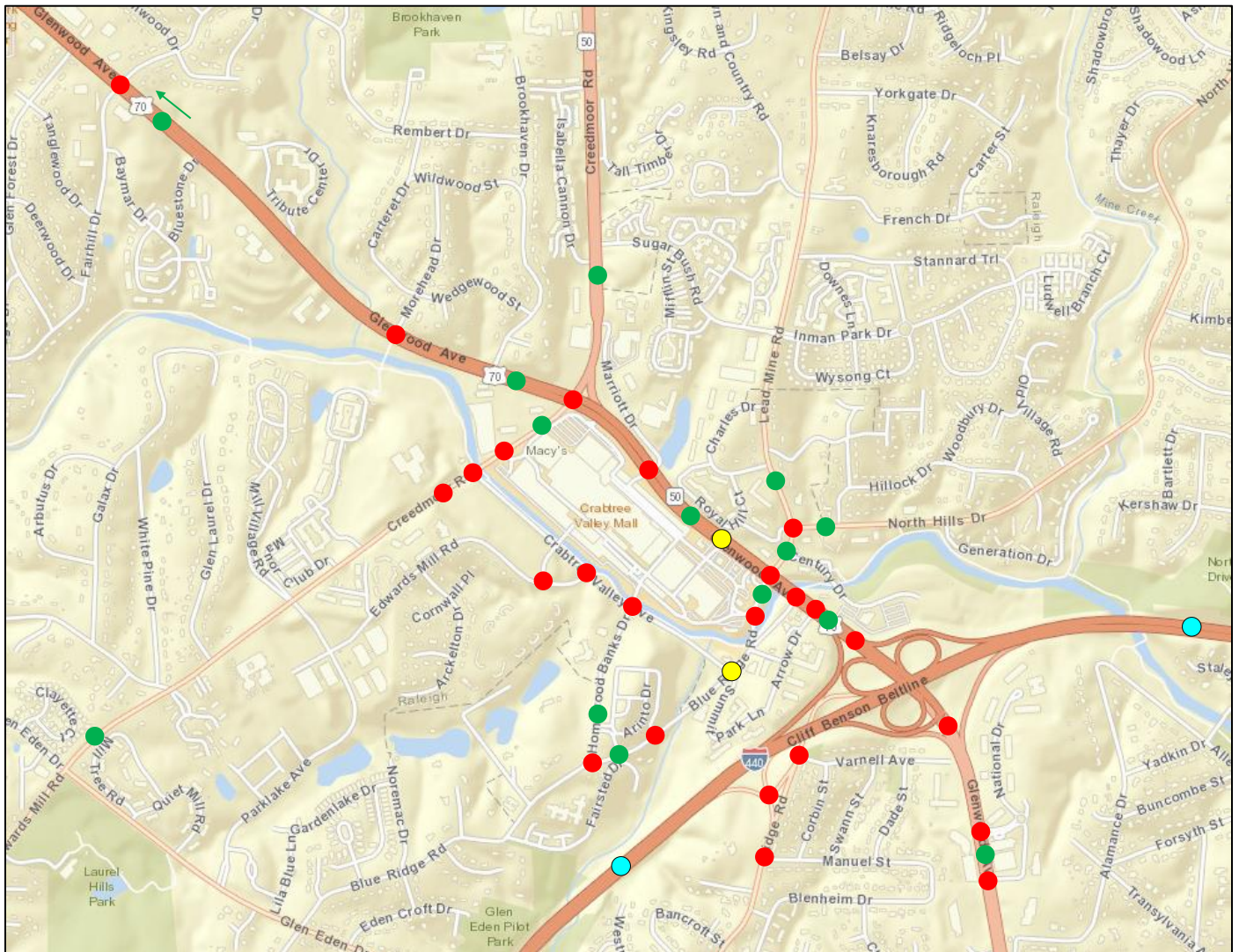
for Interstate Routes (1.27) has a slightly higher conversion factor than the custom factor (1.20); however, the TSG rate includes many facilities that include substantial long-distance travel in off peak periods that are not as likely for an urban loop Interstate route. Therefore, the custom factor was utilized for converting the I-440 counts to 24-hours. The count expansion factors were also compared to the count data from the 48-hour volume, speed, classification count and determined to be adequate.

Figure 2-1: Traffic Volume Data Locations (1)



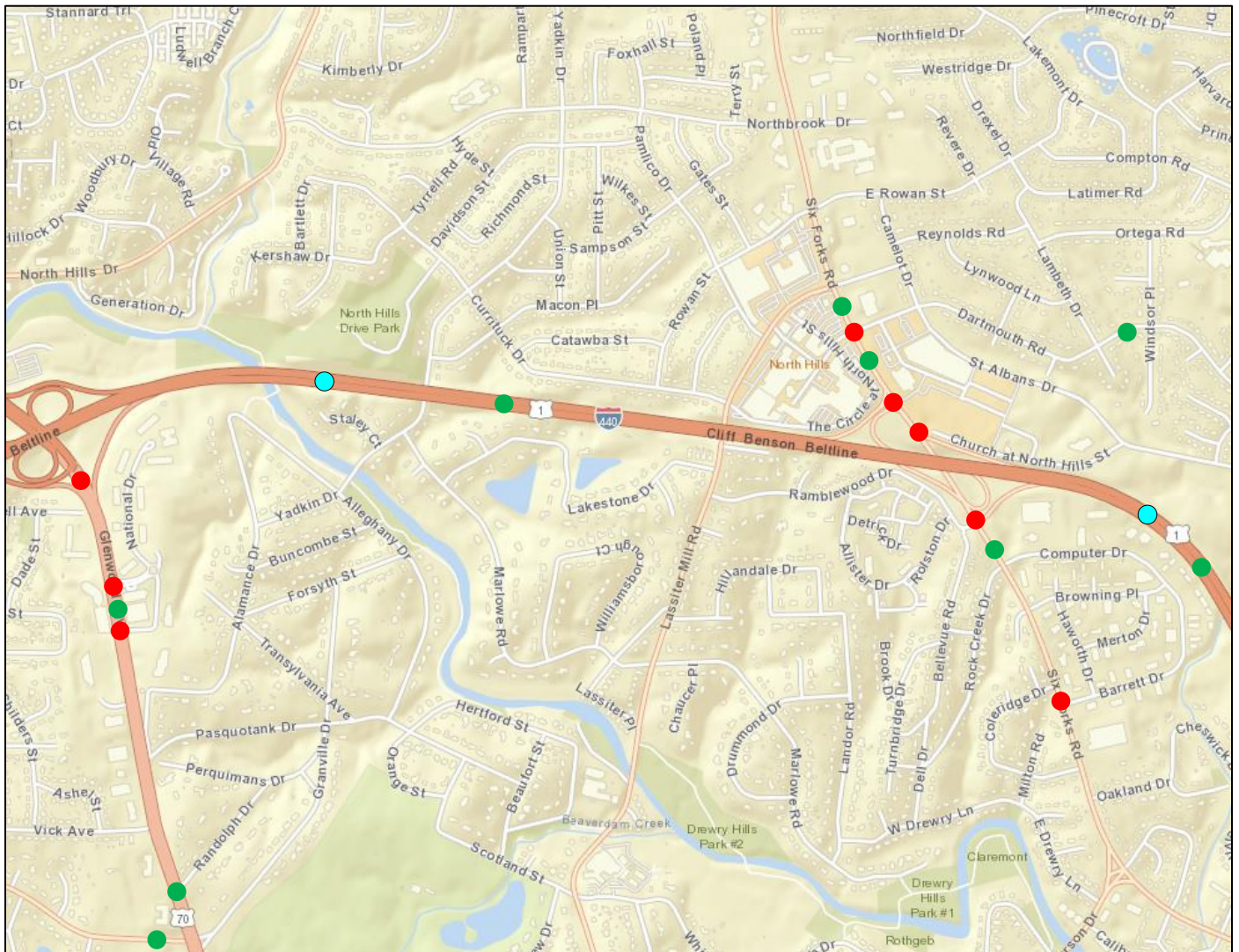
- - NCDOT AADT Count Station
- - TMC Count Location
- - 24-hour TMC Count Location
- - Manual Classification Count Location

Figure 2-2: Traffic Volume Data Locations (2)



- - NCDOT AADT Count Station
- - TMC Count Location
- - 48-hour Classification Count Location
- - Manual Classification Count Location

Figure 2-3: Traffic Volume Data Locations (3)



- - NCDOT AADT Count Station
- - TMC Count Location
- - 48-hour Classification Count Location
- - Manual Classification Count Location

Table 2-1: Collected Traffic Count Locations

Location	Count Type	Date(s)	County	ATR Group	Seasonal Adjustment Factor
US 70 (Glenwood Ave) at Woman's Club Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at National Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at I-440 Inner Ramps	13-hour TMC	11/16/17	Wake	4/11	1.02/1.01
US 70 (Glenwood Ave) at I-440 Outer Ramps	13-hour TMC	11/16/17	Wake	4/11	1.02/1.01
US 70 (Glenwood Ave) at Arrow Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Crabtree Valley Pl	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Blue Ridge Rd (SR 1670)/Lead Mine Rd (SR 1820)	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Crabtree Valley Mall Driveway	24-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Crabtree Valley Mall/Marriot Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Creedmoor Rd (NC 50)	13-hour TMC	11/16/17	Wake	4	1.02
US 70 (Glenwood Ave) at Morehead Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
US 70 (Glenwood Ave) at Fairhill Dr/Rembert Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
Ridge Rd at Manuel St	13-hour TMC	11/16/17	Wake	1	0.99
Ridge Rd at I-440 Ramps	13-hour TMC	11/16/17	Wake	1/11	0.99/1.01
Ridge Rd at Varnell Ave	13-hour TMC	11/16/17	Wake	1	0.99
Blue Ridge Rd (SR 1670) at Homewood Banks Dr (SR 1669)	13-hour TMC	11/16/17	Wake	1	0.99
Blue Ridge Rd (SR 1670) at Arinto Dr	13-hour TMC	11/16/17	Wake	1	0.99
Blue Ridge Rd (SR 1670) at Crabtree Valley Ave	24-hour TMC	11/16/17	Wake	1	0.99
Blue Ridge Rd (SR 1670) at Crabtree Valley Mall Driveway	13-hour TMC	11/16/17	Wake	1	0.99
Lead Mine Rd (SR 1820) at North Hills Dr	13-hour TMC	11/16/17	Wake	1	0.99
Creedmoor Rd (SR 3009) at Riverwood Cr	13-hour TMC	11/16/17	Wake	1	0.99
Creedmoor Rd (SR 3009) at Crabtree Valley Ave	13-hour TMC	11/16/17	Wake	1	0.99
Creedmoor Rd (SR 3009) at Crabtree Valley Mall Driveway	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
Crabtree Valley Ave at Homewood Banks Dr (SR 1669)	13-hour TMC	11/16/17	Wake	1	0.99
Crabtree Valley Ave at Edwards Mill Rd	13-hour TMC	11/16/17	Wake	1	0.99
Edwards Mill Rd at Crabtree Apartments Driveway	13-hour TMC	11/16/17	Wake	1	0.99
Lake Boone Trail at Wycliff Rd	13-hour TMC	11/16/17	Wake	1	0.99
Lake Boone Trail at Myron Dr	13-hour TMC	11/16/17	Wake	1	0.99
Lake Boone Trail at I-440 Outer Ramps	13-hour TMC	11/16/17	Wake	1/11	0.99/1.01
Lake Boone Trail at I-440 Inner Ramps	13-hour TMC	11/16/17	Wake	1/11	0.99/1.01

Location	Count Type	Date(s)	County	ATR Group	Seasonal Adjustment Factor
Lake Boone Trail at Ridge Rd	13-hour TMC	11/16/17	Wake	1	0.99
Ridge Rd at Glen Eden Dr	13-hour TMC	11/16/17	Wake	1	0.99
Six Forks Rd (SR 1005) at Barrett Dr	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
Six Forks Rd (SR 1005) at I-440 Inner Ramps	13-hour TMC	11/16/17	Wake	4/11	1.02/1.01
Six Forks Rd (SR 1005) at I-440 Outer Off-ramp	13-hour TMC	11/16/17	Wake	4/11	1.02/1.01
Six Forks Rd (SR 1005) at I-440 Outer Ramps/Front St	13-hour TMC	11/16/17	Wake	4/11	1.02/1.01
Six Forks Rd (SR 1005) at Main St/Dartmouth Rd	13-hour TMC	11/16/17	Wake	4/1	1.02/0.99
I-440 east of Six Forks Rd (SR 1005)	14-hour MCC	11/16/17	Wake	11	1.01
I-440 east of US 70 (Glenwood Ave)	14-hour MCC	11/16/17	Wake	11	1.01
I-440 west of Ridge Rd	14-hour MCC	11/16/17	Wake	11	1.01
I-440 west of Lake Boone Trail	14-hour MCC	11/16/17	Wake	11	1.01

Note: TMC = turning movement count; MCC = manual classification count

2.4 FIELD INVESTIGATION

An orientation field trip was taken as part of the traffic forecast initiation process. The field trip was taken on February 14, 2018. The following observations were noted:

- The land use along US 70 is a mostly commercial. There are several driveways into Crabtree Valley Mall.
- The land use along Ridge Rd is a mostly suburban residential. These residences are primarily located on small lots.
- The land use along Lake Boone Trail is a mix of suburban residential and commercial. There are several driveways into Crabtree Valley Mall.
- There is a new apartment complex near Crabtree Valley Ave and Homewood Banks Dr that is currently leasing and could add trips.
- The PM peak direction of travel on US 70 is northbound.
- The PM peak direction of travel on Lake Boon Trail is Eastbound.
- The PM traffic peaked at around 5:15 to 5:30. There was congestion on both the Northbound and Southbound directions of US 70 near the I-440 ramps. There was also congestion near the main entrance of Crabtree Valley Mall / Marriott Dr. Blue Ridge Rd traffic entering onto US 70 also had congestion issues. Traffic was also backing up on Lake Boone Trail at the unsignalized I-440 East on ramp.

2.5 INFORMATION FROM LOCAL PLANNERS

Questionnaires were sent to, completed by or discussed with the following individuals to assist in understanding the project and traffic forecast study area:

- *David Keilson, NCDOT Division 5 – Division Planning Engineer
- John Sandor, NCDOT Division 5 – Deputy Division Traffic Engineer
- M. Scott Wheeler, NCDOT Division 5 – District 1 Engineer
- Boyd Tharrington, NCDOT Division 5 Construction Engineer
- *Mark Eatman, NCDOT TPD
- *Scott Walston, NCDOT TPD
- Chris Lukasina, Capital Area MPO – Executive Director
- *Alex Rickard, Capital Area MPO – Deputy Director
- *Tim Gardiner, Wake County – Transportation Planner
- Eric Lamb, City of Raleigh – Transportation Planning Manager

Individuals who provided a response are denoted with an *. Detailed information from the questionnaires is included in Appendix B.

2.6 OTHER SOURCES

Data sources used that are not listed in Sections 2.1 through 2.5 include:

North Carolina Department of Transportation. *State Transportation Improvement Program*. January 2018. Available: <https://connect.ncdot.gov/projects/planning/STIPDocuments1/2018-2027%20STIP%20-%20Divisions%201-7.pdf>

Capital Area Metropolitan Planning Organization. *Draft 2045 Metropolitan Transportation Plan*. Adopted December 13, 2017. Available: <http://www.campo-nc.us/transportation-plan/draft-2045-metropolitan-transportation-plan#FinalMTPDoc>

NCDOT Functional Classification Maps. Available: <http://ncdot.maps.arcgis.com/home/webmap/viewer.html?layers=029a9a9fe26e43d687d30cd3c08b1792>

NCDOT AADT Web Map. Available: <https://ncdot.maps.arcgis.com/home/webmap/viewer.html?webmap=b7a26d6d8abd419f8c27f58a607b25a1>

3. BASE YEAR 2017 NO-BUILD TRAFFIC FORECAST

3.1 METHODOLOGY

A review of previous traffic forecasts, field-collected traffic counts, area AADT history, and engineering judgment serve as the basis for the 2017 Base Year No-Build traffic forecast. After careful review for reasonableness checks, 14-hour manual classification counts, 24-hour TMCs, and 13-Hour TMCs were first converted to AADT volumes by using the appropriate NCDOT TSG seasonal adjustment factors based on the month and day of the week the counts were collected.

A variation of the NCDOT Traffic Forecast Utility (TFU) spreadsheet was also a major tool used in the determination of the traffic forecast volumes. The NCDOT TFU spreadsheet includes the calculation of a validation score that considers the approach volumes and design factors for each intersection. The score is utilized as a tool in selecting the appropriate volumes and factors with a score that is less than 2.0 being valid. All scores for the 2017 Base Year forecast were 2.0 or less. Ultimately, the approach volumes and factors were selected based on engineering judgment such that the AADTs and turning movements can be converted to peak hour volumes.

For forecasting purposes, the ramp movements at each interchange were combined to present the interchange as a single intersection location. Doing so involved balancing the turning movement counts from multiple locations (the ramp intersections).

The interchange of I-440 with Ridge Road presents some challenges from a forecasting perspective because of its unusual design. The interchange is a partial interchange, meaning that it is possible for eastbound I-440 traffic to exit to Ridge Road and for traffic on Ridge Road to enter onto I-440 heading eastbound. It is also possible for westbound I-440 traffic to exit to Ridge Road, but not for Ridge Road traffic to enter onto I-440 heading westbound. However, the I-440 westbound traffic to Ridge Road shares an exit ramp with the loop for traffic exiting to travel southbound on Glenwood Avenue (the fly-over ramp exiting to Ridge Road splits off from the loop within a short distance from the mainline exit). Furthermore, the I-440 westbound off-ramp to Ridge Road joins Ridge Road north of the intersection with the I-440 eastbound ramps with another roadway, Varnell Avenue, intersecting Ridge Road between the two locations. For the purposes of the forecast, the disparate movements between I-440 and Ridge Road are represented by a single location, and the Varnell Avenue traffic is represented as being south of the I-440 ramps.

There are quite a few movement-restricted intersections represented in this forecast, primarily right-in/right-out only side streets (RIRO) (for example, the National Drive intersection with Glenwood Avenue), which necessitated the representation of non-reciprocal movements along the roadway links where the link volume was not evenly divided among both directions. In order to provide a volume forecast for the areas with non-reciprocal traffic due to access prohibitions or non-reciprocal turning movements, the volumes were separated directionally for some of the links within the forecast.

The data from the field-collected traffic counts were incorporated into the spreadsheet to replicate volumes as closely as possible for each intersection in the traffic forecast. The traffic forecast volumes in the 2017 Base-Year traffic forecast mimic the observed patterns as closely as possible. Once the traffic forecast volumes were determined, they were compared to historic AADT trends and interpolated model volumes for reasonableness. Table C1 found in Appendix C provides a comparison of historic AADT trends, field collected data, interpolated model volumes, and the selected traffic forecast volumes for all locations within the study area.

3.2 DESIGN FACTORS

Design factors are a very important aspect of traffic forecasting. The truck percentages, peak hour factor (or K-Factor), and directional distribution are all used along with forecasted traffic volumes when designing a roadway. The methodology and chosen values for each of the aforementioned factors are described below.

3.2.1 TRUCK PERCENTAGES

Truck Percentages were determined using the 14-hour manual classification counts, and the TMC data. Overall truck percentages were then separated into the two NCDOT standard classifications: Duals (single-unit trucks with at least one dual-tire axle) and TTSTs (multi-unit trucks with single or twin trailers). Attempts were made to maintain consistent truck percentages along a roadway facility unless circumstances warranted a change. Data used to determine the truck percentages and the chosen values are found in Table C2 in Appendix C. A discussion of the truck percentages for the project is also included as follows:

- I-440 Corridor – the truck percentages from the manual classification counts were very consistent along the corridor, ranging from two to three percent duals and one percent TTSTs. The NCDOT AADT Web Map shows two percent duals and one percent TTSTs. The forecast utilizes three percent duals and one percent TTSTs along the entire length of the I-440 corridor.
- Lake Boone Trail – the truck percentages from the turning movement counts were very consistent along Lake Boone Trail, ranging from one to two percent duals and one percent TTSTs. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the Lake Boone Trail corridor.
- Ridge Road – the truck percentages from the turning movement counts were very consistent along Ridge Road, ranging from one to two percent duals and one percent TTSTs. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the Ridge Road corridor
- Crabtree Valley Avenue – the truck percentages from the turning movement counts were fairly consistent along Crabtree Valley Avenue, ranging from two to four percent duals and one percent TTSTs. The forecast utilizes four percent duals and one percent TTSTs north of Edwards Mill Drive and three percent duals and one percent TTSTs south of Edwards Mill Drive.
- Glenwood Avenue (US 70) – truck percentages from the turning movement counts were fairly consistent along Glenwood Avenue, ranging from two to four percent duals and one percent TTSTs. The NCDOT AADT Web Map shows two percent duals and one percent TTSTs for this corridor. The forecast utilizes three percent duals and one percent TTSTs north of I-440 and two percent duals and one percent TTSTs south of I-440.
- Creedmoor Road (SR 3009/NC 50) – the truck percentages from the turning movement counts were very consistent along Creedmoor Road, ranging from one to two percent duals and one percent TTSTs. The NCDOT AADT Web Map shows two percent duals and one percent TTSTs for this corridor. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the Creedmoor Road corridor.
- Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820) – the truck percentages from the turning movement counts were very consistent along the Blue Ridge Road/Lead Mine Road corridor, ranging from one to two percent duals and one percent TTSTs. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the corridor.

- Six Forks Road (SR 1005) – the truck percentages from the turning movement counts were very consistent along Six Forks Road, ranging from one to two percent duals and one percent TTSTs. The forecast utilizes two percent duals and one percent TTSTs along the entire length of the Six Forks Road corridor.
- Y-lines – the overall percentages of the Y-lines in the study area ranged from 1 to 6 percent duals and 0 to 1 percent TTSTs. The forecast utilizes truck percentages that are consistent with the count percentages as much as possible; but a minimum overall truck percentage of 3 percent was used for the Y-lines (2 percent duals and 1 percent TTSTs), which was deemed appropriate, given the collected traffic data and the nature of the roadways.

3.2.2 DIRECTIONAL DISTRIBUTION

The directional distribution (D) provides information on the direction of traffic flow in the peak period and is a percentage (rounded to the nearest 5 percent) based on the percent of traffic traveling in each direction along the roadway. In addition to the directional distribution percentage, the direction of the peak travel during the PM peak period is selected and included on the forecast figures. The forecast study area features some roads in which the measured directional distribution was substantial due to non-reciprocal traffic volumes. Generally, D was in the 50% to 70% range for the corridors included in the forecast study area. The D values for the y-lines varied greatly by location and land use. The D values were measured from as low as 50% (at one of the Crabtree Valley Mall driveways) to as high as 94% (at National Drive, a RIRO location).

Table C3 in Appendix C provides the D value information used for this traffic forecast. A discussion of the D values for the project is also included as follows:

- I-440 Corridor – the directional distribution along I-440 ranged from 50 to 54 percent with a predominant PM peak period direction in the eastbound direction. The average distribution was approximately 52.5 percent along the entire corridor and, based on a review of the data, it was determined that a single value would be used for the entire length of the I-440 corridor. The directional distribution was determined to be 55 percent along the entire corridor with a PM peak in the eastbound direction.
- Lake Boone Trail – the directional distribution along Lake Boone Trail was moderately directional and ranged from 51 to 71 percent with a predominant PM peak period direction in the southbound direction. The average distribution was approximately 67.0 percent north of I-440 and approximately 51.3 percent south of I-440. Based on a review of the data, it was determined that a value of 65 percent would be used for Lake Boone Trail north of Wycliff Road and a value of 70 percent would be used from Wycliff Road to I-440, both sections with a southbound PM peak direction. The directional distribution was determined to be 55 percent along the Lake Boone Trail corridor south of I-440 with a southbound PM peak direction.
- Ridge Road – the directional distribution along Ridge Road ranged from 53 to 60 percent with a predominant PM peak period direction in the southbound direction. The average distribution was approximately 54.8 percent from I-440 to Glen Eden Drive and approximately 59.0 percent south of Glen Eden Drive. Based on a review of the data, it was determined that a value of 55 percent would be used for Ridge Road from I-440 to Glen Eden Drive with a southbound PM peak direction. The directional distribution was determined to be 60 percent along the Ridge Road corridor south of Glen Eden Drive with a southbound PM peak direction.
- Crabtree Valley Avenue – the directional distribution along Crabtree Valley Avenue ranged from 58 to 64 percent with a predominant PM peak period direction in the southbound direction. The average distribution was approximately 58.7 percent north of Edwards Mill Road and approximately 63.2 percent south of Edwards Mill Road. Based on a review of the data, it was determined that a value of 60 percent would be used for

Crabtree Valley Avenue north of Edwards Mill Road with a southbound PM peak direction. The directional distribution was determined to be 65 percent along the Crabtree Valley Avenue corridor south of Edwards Mill Road with a southbound PM peak direction.

- Glenwood Avenue (US 70) – the directional distribution along Glenwood Avenue ranged from 52 to 61 percent with a predominant PM peak period direction in the northbound direction. The average distribution was approximately 54.7 percent north of I-440 and approximately 58.4 percent south of I-440. Based on a review of the data, it was determined that a value of 55 percent would be used for Glenwood Avenue north of I-440 with a northbound PM peak direction. The directional distribution was determined to be 60 percent along the Glenwood Avenue corridor south of I-440 with a northbound PM peak direction.
- Creedmoor Road (SR 3009/NC 50) – the directional distribution along Creedmoor Road was moderately directional and ranged from 62 to 65 percent with a predominant PM peak period direction in the eastbound direction. The average distribution was approximately 63.0 percent along the entire corridor and, based on a review of the data, it was determined that a single value would be used for the entire length of the Creedmoor Road corridor. The directional distribution was determined to be 65 percent along the entire corridor with a PM peak in the eastbound direction.
- Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820) – the directional distribution along the Blue Ridge Road/Lead Mine Road corridor ranged from 52 to 58 percent with a predominant PM peak period direction in the eastbound direction. The average distribution was approximately 54.6 percent along the entire corridor and, based on a review of the data, it was determined that a single value would be used for the entire length of the Blue Ridge Road/Lead Mine Road corridor. The directional distribution was determined to be 55 percent along the entire corridor with a PM peak in the eastbound direction.
- Six Forks Road (SR 1005) – the directional distribution along Six Forks Road was not particularly directional and ranged from 51 to 56 percent but with no predominant PM peak period direction. The average distribution was approximately 52.5 percent along the corridor. North of Dartmouth Road/Main Street, the directional distribution was determined to be 55 percent with a PM peak northbound direction. From Dartmouth Road/Main Street to I-440, the directional distribution was determined to be 50 percent with neither a northbound nor southbound direction. The selection of a directional distribution of 50 percent is not typical; however, due to the mixing of northbound traffic to the residential areas and the southbound traffic from the office and commercial uses in North Hills the counts showed nearly even volumes in each direction; therefore, the 50 percent value was determined to be reasonable. From I-440 to Barrett Drive, the directional distribution was determined to be 55 percent with a PM peak northbound direction. South of Barrett Drive, the directional distribution was determined to be 55 percent with a PM peak southbound direction.
- Y-lines – the directional distributions for Y-lines in the forecast area ranged from 50 to 94 percent. Wherever possible the selected directional distributions were in line with the turning movement count percentages.

3.2.3 PEAK HOUR FACTOR

The peak hour factor (K) is the percentage of AADT that occurs during the peak time period of the day. The K-factor is meant to approximate what percentage of daily traffic would be present during the 30th highest peak hour of a given year, which is commonly referred to as K30. The K-factor was developed by dividing the peak hour of the turning movement counts and manual classification counts by the daily volume. The calculated K-factors in this traffic forecast range from 6% to 19%. The calculation of peak hour factor, based on the methodology described, is close to K30 and

suitable for use in the forecast. The K-factor information used for this forecast is found in Table C4 in Appendix C. A discussion of the K values for the project is also included as follows:

- I-440 Corridor – the peak hour factor along the I-440 corridor was a consistent 8 percent. The peak hour factor for the corridor was determined to be 8 percent, which is consistently maintained along the corridor.
- Lake Boone Trail – the peak hour factor along Lake Boone Trail ranged from 6 to 12 percent with higher peak hour factors on the southern side of I-440. The peak hour factor for the corridor north of I-440 was determined to be 7 percent, and the peak hour factor south of I-440 was determined to be 10 percent.
- Ridge Road – the peak hour factor along Ridge Road generally ranged from 12 to 14 percent and had relatively consistent percentages along the corridor. The peak hour factor for the corridor was determined to be 13 percent, which is consistently maintained along the corridor except for Ridge Road west of Lake Boone Trail which had a peak hour factor of 12 percent.
- Crabtree Valley Avenue – the peak hour factor along Crabtree Valley Avenue ranged from 8 to 9 percent and had relatively consistent percentages along the corridor. The peak hour factor for the corridor north of Edwards Mill Road was determined to be 8 percent, and the peak hour factor south of Edwards Mill Road was determined to be 9 percent.
- Glenwood Avenue (US 70) – the peak hour factor along Glenwood Avenue ranged from 7 to 9 percent with higher peak hour factors on the northern and southern ends of the corridor. The peak hour factor for the corridor north of Creedmoor Road was determined to be 9 percent, the peak hour factor between Creedmoor Road and I-440 was determined to be 8 percent, and the peak hour factor south of I-440 was determined to be 9 percent.
- Creedmoor Road (SR 3009/NC 50) – the peak hour factor along Creedmoor Road ranged from 8 to 9 percent and had relatively consistent percentages along the corridor. The peak hour factor for the corridor west of Glenwood Avenue was determined to be 9 percent, and the peak hour factor east of Glenwood Avenue was determined to be 8 percent.
- Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820) – the peak hour factor along the Blue Ridge Road/Lead Mine Road corridor ranged from 8 to 9 percent and had relatively consistent percentages along the corridor. The peak hour factor for the corridor west of Crabtree Valley Avenue was determined to be 9 percent, and the peak hour factor east of Crabtree Valley Avenue was determined to be 8 percent.
- Six Forks Road (SR 1005) – the peak hour factor along Six Forks Road ranged from 7 to 8 percent and had relatively consistent percentages along the corridor. The peak hour factor for the corridor north of I-440 was determined to be 7 percent, and the peak hour factor south of I-440 was determined to be 8 percent.
- Y-lines – the peak hour factors for Y-lines within the forecast area generally ranged from 6 to 19 percent and the selected peak hour factors were largely in line with the turning movement count percentages.

3.3 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 3.1, traffic forecasts for the 2017 Base Year No-Build Scenario were calculated. Adjusted counts were compared to trend line analyses and the extrapolation of data to 2017 during the process. Utilizing a variation of the NCDOT Traffic Forecast Utility spreadsheet, bidirectional turning movements were

also forecasted at intersections to replicate observed daily turning movement volumes as closely as possible. Comparisons of trend line analyses, volume extrapolation, observed counts, and selected forecast volumes are shown in Table C1 in Appendix C. A discussion of the traffic forecast volumes is included as follows:

- The traffic forecast includes break lines at two locations. One break occurs on Blue Ridge Road between Crabtree Valley Avenue and the Crabtree Valley Mall driveway where it was determined that the volume between the intersections was affected substantially enough by the intervening connection to Crabtree View Place that a single link volume was not representative of the volume between the two intersections.
- The other break is on Six Forks Road between the intersections of Ramblewood Drive and Barrett Drive. At this location it was determined that the volume between the intersections was affected substantially enough by the intervening roadway intersections that a single link volume was not representative of the volume between the two intersections.

4. MODEL DATA

The study area for the forecast is included the Triangle Regional Travel Demand Model. The study area is located in the central area of the model and has relatively good connectivity, with the model including all of the major roadways (I-440, Lake Boone Trail, Ridge Road, Glenwood Avenue (US 70), Creedmoor Road (SR 3009/NC 50), Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820), and Six Forks Road (SR 1005)), and several of the minor y-line roadways (including Wycliff Avenue, Glen Eden Drive, and Dartmouth Road). The Triangle Regional Model v6 (provided by ITRE on 02/01/2018 as authorized by NCDOT) was utilized as a tool in the development of the forecast to determine the future year scenarios traffic volumes.

The Triangle Model was developed in TransCAD (version 6 Build 9195) and was calibrated based on a base year of 2013, and has models for intermediate years of 2025 and 2035 and a future year of 2045. Travel demand modeling for this forecast was completed by Clearbox Forecast Group, PLLC. The first step was to review the model in the vicinity of the study area. Based on this review the following two changes were made to the model:

- The speed limit on Crabtree Valley Avenue was 25 mph in the model. The speed limit was updated to match the 35 mph speed limit in place at this time.
- The TAZ that includes Crabtree Valley Mall includes three centroid connectors that connect to 1) US 70; 2) Blue Ridge Road and 3) Creedmoor Road. Crabtree Valley Mall has seven access points with two off of Crabtree Valley Avenue; therefore, a fourth centroid connector was added that connects to Crabtree Valley Avenue.

Table C5 can be found in Appendix C and displays the model performance for the 2013 model against 2013 AADTs, the 2045 model volumes, and an extrapolated volume for 2017 based on the 2013 and 2045 model output. A discussion of the model performance for the project study area corridors is included as follows:

- I-440 Corridor – the 2013 model volumes for the I-440 corridor were generally higher than the corresponding AADT. The western end of the project area was higher in the model by 13,000 vehicles per day, the model was higher by 8,000 vehicles per day between Lake Boone Trail and Ridge Road, the model was lower by 3,000 vehicles per day between Glenwood Avenue and Six Forks Road, and the model was higher by 5,000 vehicles per day east of Six Forks Road. The 2017 interpolated model volumes are also higher than the 2017 AADT, with the eastern end of the project corridor showing larger discrepancies (up to 23,000 vehicles per day) than the western end (slightly more than 1,000 vehicles per day).
- Lake Boone Trail – the 2013 model volumes for the Lake Boone Trail corridor were generally higher than the corresponding AADT. The model volumes are higher by 1,000 to 3,000 vehicles per day, although the model volumes are lower than the AADT by 5,000 vehicles per day north of I-440. The 2017 interpolated model volumes are lower than the 2017 AADTs north of I-440 and higher than the 2017 AADTs south of I-440.
- Ridge Road – there are no corresponding 2013 AADT volumes on Ridge Road to compare the model base year volumes to. The 2017 interpolated model volumes are higher and lower than the 2017 AADTs depending on the location along the corridor.
- Crabtree Valley Avenue – there are no corresponding 2013 AADT volumes on Crabtree Valley Avenue to compare the model base year volumes to. From the Crabtree Valley Mall Driveway to Creedmoor Road, the 2017 interpolated model volumes are slightly lower than the 2017 AADT average. From the Crabtree Valley Mall Driveway south to Blue Ridge Road, the 2017 interpolated model volumes are much lower than the 2017 AADTs (by only 5,000 vehicles per day, but a difference that represents a 95% difference).

- Glenwood Avenue (US 70) – north of Creedmoor Road, the 2013 model volumes are higher than the corresponding AADTs by 4,000 to 500 vehicles per day. South of Creedmoor Road, the 2017 model volumes are higher than the corresponding AADTs by 20,000 to 25,000 vehicles per day (no 2013 AADT was available on Glenwood Avenue south of I-440). North of Creedmoor Road, the interpolated 2017 model volumes are lower than the 2017 AADTs by 8,000 to 12,000 vehicles per day. From Creedmoor Road to I-440, the interpolated 2017 model volumes are higher than the 2017 AADTs by 5,000 to 9,000 vehicles per day. South of I-440, the interpolated 2017 model volumes are lower than the 2017 AADTs by 3,000 to 6,000 vehicles per day.
- Creedmoor Road (SR 3009/NC 50) – the 2013 model volumes for the Creedmoor Road corridor were higher than the corresponding AADT by 2,500 vehicles per day on the west end of the corridor in the study area and by 13,000 vehicles per day on the east end of the corridor in the study area (east of Glenwood Avenue). The 2017 interpolated model volumes were 1,000 to 8,000 vehicles per day lower than the AADT west of Glenwood Avenue. East of Glenwood Avenue, the 2017 interpolated model volumes were 4,000 vehicles per day higher than the recorded AADT.
- Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820) – the 2013 model volumes for the Blue Ridge Road/Lead Mine Road corridor were lower than the corresponding AADT by 2,000 vehicles per day on the west end of the corridor in the study area, and they were higher by 3,000 to 6,000 vehicles per day on the east end of the corridor in the study area (on either side of Glenwood Avenue). The 2017 interpolated model volumes differed from the recorded AADTs in a similar fashion – lower on the west end and higher on the east end.
- Six Forks Road (SR 1005) – Within the study area, 2013 AADT was only available on Six Forks Road north of the I-440 interchange where the 2013 model volumes were quite a bit higher than the AADTs. The difference was 15,000 vehicles per day, about a 31% difference. The 2017 interpolated model volumes north of I-440 were higher than the recorded 2017 AADTs by 4,000 to 11,000 vehicles per day, while the model volumes south of I-440 were lower than the recorded 2017 AADTs by 10,000 to 16,000 vehicles per day.

5. BASE YEAR 2017 BUILD TRAFFIC FORECAST

5.1 ASSUMPTIONS

The 2017 Build traffic forecast contains all of the assumptions found in the 2017 No-Build traffic volume network discussed in Section 3. The I-5870 project for Alternatives 1 and 2 were coded into the TRM based on the conceptual design plans. The modifications to the model included adding the proposed interchange that connects to Crabtree Valley Avenue and widening Crabtree Valley Avenue to four-lanes from Blue Ridge Road to Creedmoor Road. Additionally, a fourth centroid connector was added to the model from Crabtree Valley Mall to Crabtree Valley Avenue to represent the access on the back side of the mall.

The build forecasts were based on the conceptual designs for each of the following alternatives:

- Alternative 1 – 2011 City of Raleigh Study Preferred Alternative, with echelon intersection at Glenwood Avenue and Blue Ridge Road/Lead Mine Road
- Alternative 2 – Diverging Diamond Interchange (DDI) Conceptual Alternative, with a Continuous Flow Intersection (CFI) option at Glenwood Avenue and Blue Ridge Road/Lead Mine Road

5.2 METHODOLOGY

The data from the TRM and engineering judgment were heavily relied upon in the calculation of the 2017 Base Year Build traffic volumes. Once the travel demand model was run to include I-5870, model volumes were extracted for each location included in the evaluation. The proposed project includes a new interchange and roadways that create alternative routes for traffic to follow. Travel demand models are efficient in determining traffic volume shifts for alternative routes; however, they have several limitations. Travel demand models are not very efficient at accurately determining diversion for alternative routes that are very close to one another or have very similar travel times. Travel demand models also are not as precise as is necessary for complex operations or non-standard situations, such as the traffic patterns in and around Crabtree Valley Mall. A few substantial limitations were identified during the development of the forecast, including:

- Crabtree Valley Mall is represented by a single Traffic Analysis Zone (TAZ) that had four connections, one each to Glenwood Avenue, Blue Ridge Road, Crabtree Valley Avenue and Creedmoor Road. Traffic is loaded onto the roadways from a single location within the TAZ via centroid connectors. It is not possible to fully replicate the distribution of trips to each access point in a travel demand model. The results of the model (both in the no-build and build scenario) showed that the traffic to and from Crabtree Valley Mall was not distributed to the roadway network in a manner that was consistent with the traffic count data.
- The proposed designs also include several turn prohibitions at major intersections; however, the travel demand model has limited success in modeling these restrictions. A review of the model output data showed either irregular trip paths of these restrictions or that the model ignored the restrictions altogether.
- The travel demand model is more focused on the travel times along links and does not accurately account for the delay at intersections. Based on this, competitive routes with similar free flow travel times are not accurately modeled, nor is the increased delay of oversaturated intersections.

Based on the limitations of the model, it was determined that the TRM data would only be relied upon for changes in larger regional travel patterns and that engineering judgment based on available data would be the primary means of developing the Build forecasts.

For trips to and from Crabtree Valley Mall, an additional data source was relied upon heavily in the development of the Build forecasts. Passive origin-destination (O-D) data collected by StreetLight Data, Inc. (StreetLight) was collected from ten external locations within the traffic forecast study area to the seven primary access points to Crabtree Valley Mall. A summary of the data, shown in Figure 5-1 and Figure 5-2 provided value insight into the travel patterns for traffic entering and exiting the mall area.

A detailed description of the steps utilized in the development of the forecast is included in Section 5.4.

5.3 DESIGN FACTORS

The selection of design factors for the 2017 Build scenarios was based on a qualitative review of the study area network to determine if any link would experience a substantial change in travel patterns that may affect the design factors. Based on this review it was determined that the 2017 design factors were adequate for all locations with the exception of those for Crabtree Valley Avenue.

The design factors for Crabtree Valley Avenue and the extension of Crabtree Valley Avenue to the new interchange at I-440 were reviewed together. The current design factors show a southbound peak direction in the PM peak; however, based on the volumes diversion of traffic primarily from US 70 (Glenwood Avenue) it was decided that the most appropriate design factors would be to match the 55 percent northbound PM peak included for US 70 (Glenwood Avenue). It was also determined that maintaining the nine percent K-factor for Crabtree Valley Avenue was also the most appropriate factor based on the diverted volumes. The truck factors for Crabtree Valley Avenue and its Extension were selected as three percent duals and one percent TTSTs as both the existing roadway and US 70 had similar percentages. The design factors for both Alternative 1 and 2 are the same for Crabtree Valley Avenue and the Extension.

The selection of design factors for Alternative 2 also required developing factors for the new connection to Arrow Drive. The selected factors for the new sections of Arrow Drive are based on a balanced approach of the design factors for existing Arrow Drive and Summit Park Lane as these roadways are the ones provided access with the Alternative 2 design. The new roadway includes a 65 percent PM peak hour with the direction emanating away from Crabtree Valley Avenue (assuming vehicles are returning to the hotels in the area in the evening) with a 10 percent K-factor and two percent duals and 1 percent TTSTs.

5.4 TRAFFIC FORECAST VOLUMES

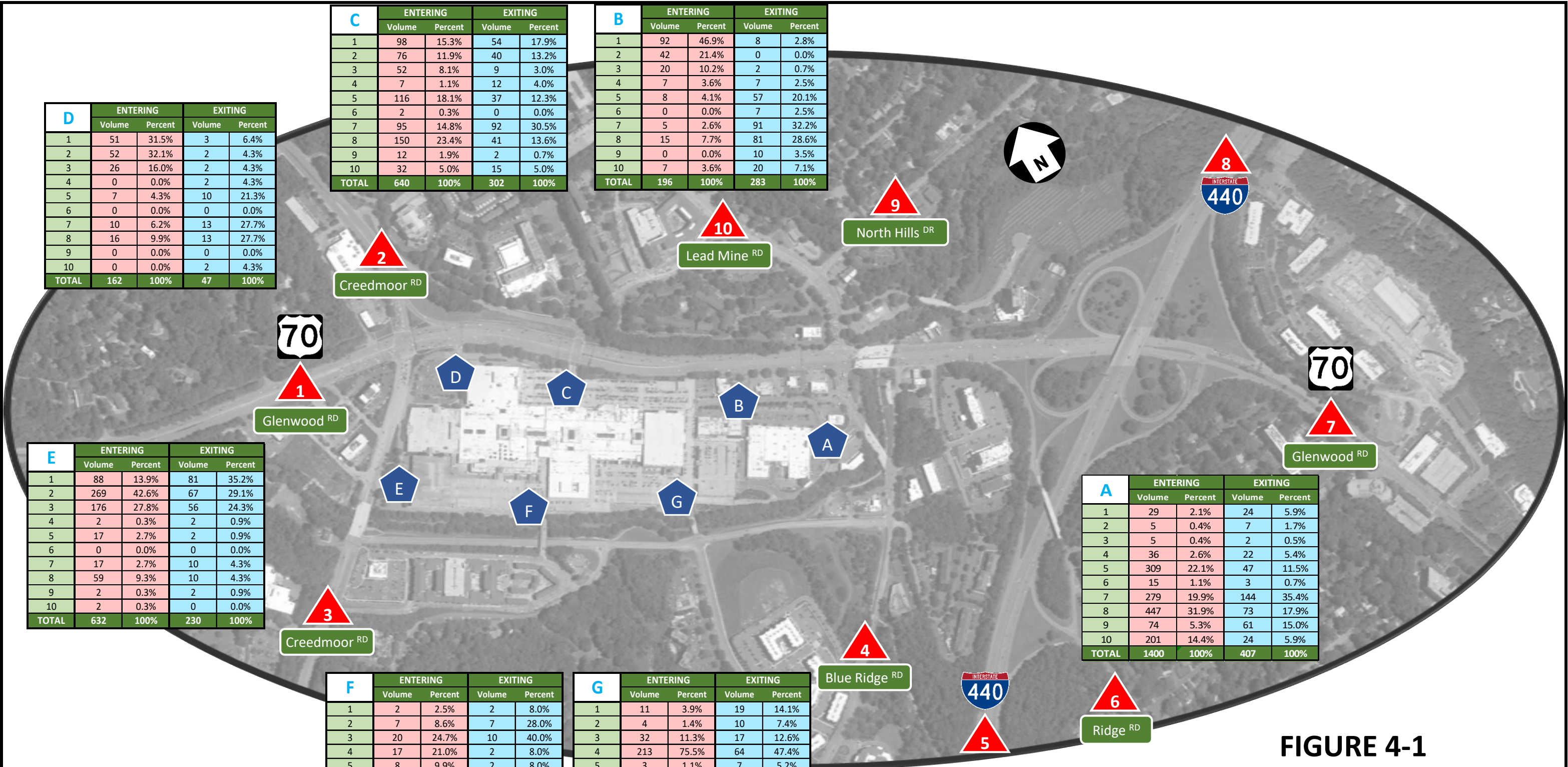
Based on the methodology described in Section 5.2 , traffic volumes for the 2017 Base Year Build Forecast Scenario were calculated for both alternatives. Table C6 (Alternative 1) and Table C7 (Alternative 2) in Appendix C show the comparisons of model output, diversion percentages, the resulting 2013-2045 CAGR and selected volumes.

A summary of the key observations and considerations from the development of the 2017 Build volumes for each Alternative are as follows:

5.4.1 ALTERNATIVE 1

Network Adjustment

First, a few minor adjustments were made to the forecast network to represent the change resulting from the Build Alternative 1 scenario. This section summarizes those changes.



D	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	51	31.5%	3	6.4%
2	52	32.1%	2	4.3%
3	26	16.0%	2	4.3%
4	0	0.0%	2	4.3%
5	7	4.3%	10	21.3%
6	0	0.0%	0	0.0%
7	10	6.2%	13	27.7%
8	16	9.9%	13	27.7%
9	0	0.0%	0	0.0%
10	0	0.0%	2	4.3%
TOTAL	162	100%	47	100%

C	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	98	15.3%	54	17.9%
2	76	11.9%	40	13.2%
3	52	8.1%	9	3.0%
4	7	1.1%	12	4.0%
5	116	18.1%	37	12.3%
6	2	0.3%	0	0.0%
7	95	14.8%	92	30.5%
8	150	23.4%	41	13.6%
9	12	1.9%	2	0.7%
10	32	5.0%	15	5.0%
TOTAL	640	100%	302	100%

B	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	92	46.9%	8	2.8%
2	42	21.4%	0	0.0%
3	20	10.2%	2	0.7%
4	7	3.6%	7	2.5%
5	8	4.1%	57	20.1%
6	0	0.0%	7	2.5%
7	5	2.6%	91	32.2%
8	15	7.7%	81	28.6%
9	0	0.0%	10	3.5%
10	7	3.6%	20	7.1%
TOTAL	196	100%	283	100%

E	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	88	13.9%	81	35.2%
2	269	42.6%	67	29.1%
3	176	27.8%	56	24.3%
4	2	0.3%	2	0.9%
5	17	2.7%	2	0.9%
6	0	0.0%	0	0.0%
7	17	2.7%	10	4.3%
8	59	9.3%	10	4.3%
9	2	0.3%	2	0.9%
10	2	0.3%	0	0.0%
TOTAL	632	100%	230	100%

F	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	2	2.5%	2	8.0%
2	7	8.6%	7	28.0%
3	20	24.7%	10	40.0%
4	17	21.0%	2	8.0%
5	8	9.9%	2	8.0%
6	0	0.0%	0	0.0%
7	0	0.0%	0	0.0%
8	22	27.2%	2	8.0%
9	0	0.0%	0	0.0%
10	5	6.2%	0	0.0%
TOTAL	81	100%	25	100%

G	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	11	3.9%	19	14.1%
2	4	1.4%	10	7.4%
3	32	11.3%	17	12.6%
4	213	75.5%	64	47.4%
5	3	1.1%	7	5.2%
6	0	0.0%	0	0.0%
7	2	0.7%	8	5.9%
8	15	5.3%	7	5.2%
9	0	0.0%	0	0.0%
10	2	0.7%	3	2.2%
TOTAL	282	100%	135	100%

A	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	29	2.1%	24	5.9%
2	5	0.4%	7	1.7%
3	5	0.4%	2	0.5%
4	36	2.6%	22	5.4%
5	309	22.1%	47	11.5%
6	15	1.1%	3	0.7%
7	279	19.9%	144	35.4%
8	447	31.9%	73	17.9%
9	74	5.3%	61	15.0%
10	201	14.4%	24	5.9%
TOTAL	1400	100%	407	100%

FIGURE 4-1

AM

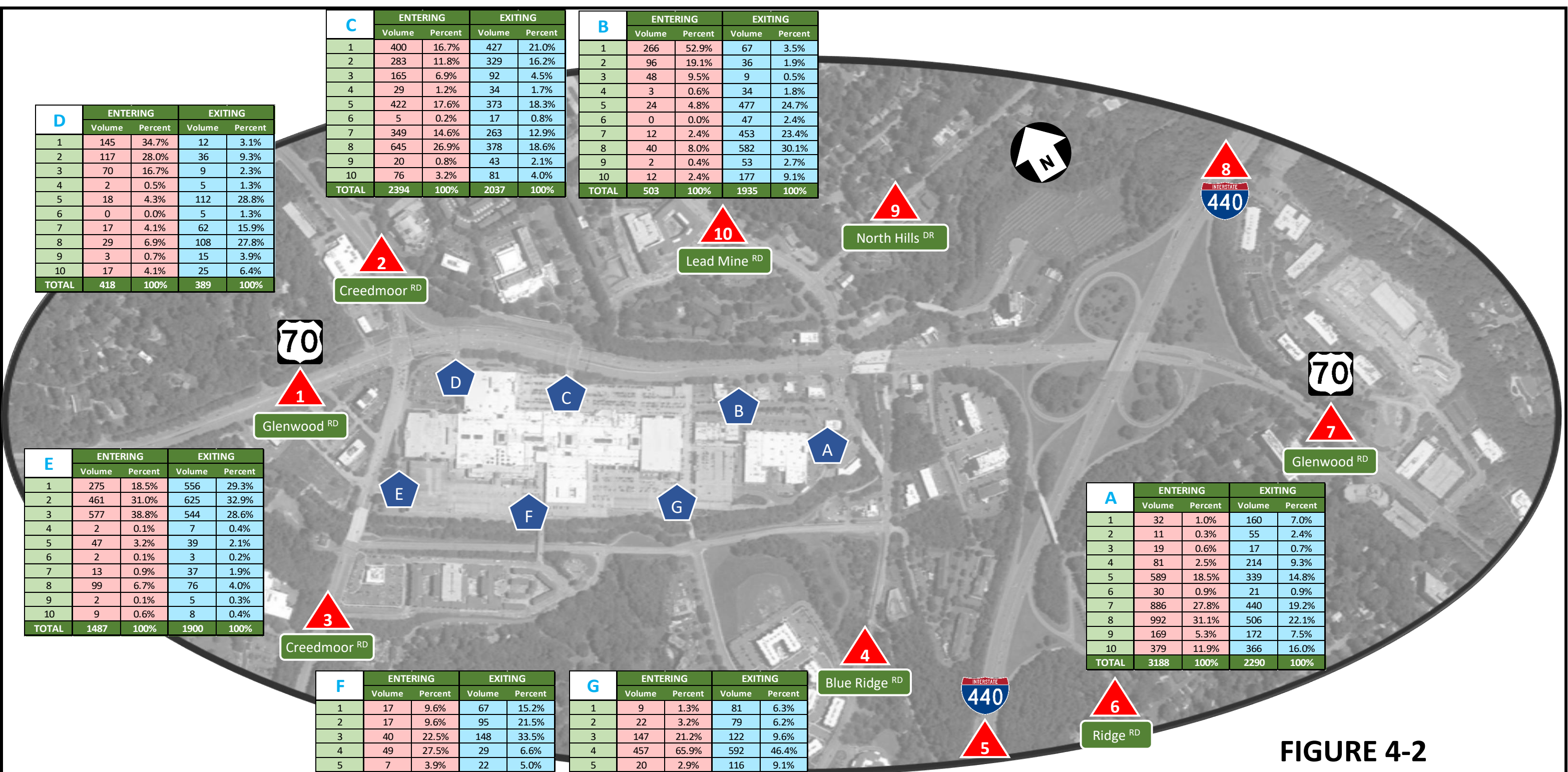
I-5870 - I-440 at Ridge Road Interchange Improvements

Crabtree Valley Mall

Origin-Destination Data

Passenger Vehicle Data for June 2016-November 2017 from 8:00 AM - 11:00 AM (Monday-Thursday)

Data Source: StreetLight Data, Inc.



D	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	145	34.7%	12	3.1%
2	117	28.0%	36	9.3%
3	70	16.7%	9	2.3%
4	2	0.5%	5	1.3%
5	18	4.3%	112	28.8%
6	0	0.0%	5	1.3%
7	17	4.1%	62	15.9%
8	29	6.9%	108	27.8%
9	3	0.7%	15	3.9%
10	17	4.1%	25	6.4%
TOTAL	418	100%	389	100%

C	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	400	16.7%	427	21.0%
2	283	11.8%	329	16.2%
3	165	6.9%	92	4.5%
4	29	1.2%	34	1.7%
5	422	17.6%	373	18.3%
6	5	0.2%	17	0.8%
7	349	14.6%	263	12.9%
8	645	26.9%	378	18.6%
9	20	0.8%	43	2.1%
10	76	3.2%	81	4.0%
TOTAL	2394	100%	2037	100%

B	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	266	52.9%	67	3.5%
2	96	19.1%	36	1.9%
3	48	9.5%	9	0.5%
4	3	0.6%	34	1.8%
5	24	4.8%	477	24.7%
6	0	0.0%	47	2.4%
7	12	2.4%	453	23.4%
8	40	8.0%	582	30.1%
9	2	0.4%	53	2.7%
10	12	2.4%	177	9.1%
TOTAL	503	100%	1935	100%

E	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	275	18.5%	556	29.3%
2	461	31.0%	625	32.9%
3	577	38.8%	544	28.6%
4	2	0.1%	7	0.4%
5	47	3.2%	39	2.1%
6	2	0.1%	3	0.2%
7	13	0.9%	37	1.9%
8	99	6.7%	76	4.0%
9	2	0.1%	5	0.3%
10	9	0.6%	8	0.4%
TOTAL	1487	100%	1900	100%

F	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	17	9.6%	67	15.2%
2	17	9.6%	95	21.5%
3	40	22.5%	148	33.5%
4	49	27.5%	29	6.6%
5	7	3.9%	22	5.0%
6	0	0.0%	0	0.0%
7	21	11.8%	29	6.6%
8	20	11.2%	40	9.0%
9	2	1.1%	5	1.1%
10	5	2.8%	7	1.6%
TOTAL	178	100%	442	100%

G	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	9	1.3%	81	6.3%
2	22	3.2%	79	6.2%
3	147	21.2%	122	9.6%
4	457	65.9%	592	46.4%
5	20	2.9%	116	9.1%
6	0	0.0%	10	0.8%
7	12	1.7%	76	6.0%
8	22	3.2%	148	11.6%
9	0	0.0%	20	1.6%
10	5	0.7%	32	2.5%
TOTAL	694	100%	1276	100%

A	ENTERING		EXITING	
	Volume	Percent	Volume	Percent
1	32	1.0%	160	7.0%
2	11	0.3%	55	2.4%
3	19	0.6%	17	0.7%
4	81	2.5%	214	9.3%
5	589	18.5%	339	14.8%
6	30	0.9%	21	0.9%
7	886	27.8%	440	19.2%
8	992	31.1%	506	22.1%
9	169	5.3%	172	7.5%
10	379	11.9%	366	16.0%
TOTAL	3188	100%	2290	100%

FIGURE 4-2

PM

I-5870 - I-440 at Ridge Road Interchange Improvements

Crabtree Valley Mall

Origin-Destination Data

Passenger Vehicle Data for June 2016-November 2017 from 3:00 PM - 7:00 PM (Monday-Thursday)

Data Source: StreetLight Data, Inc.

Network Adjustment 1 – Redirect traffic based on new ramp pattern from I-440 to Ridge Road: In order to show the trips from I-440 westbound to Ridge Road southbound in the forecast figure, a new link was added to the figure. This new link was also used to show the trips from Glenwood Avenue south of I-400 heading to Ridge Road southbound.

Trip Re-routing Due to Project

The following section details the changes to traffic patterns that result from the construction of the project. A graphical representation with the notes below is shown for each step in Figure 5-3.

Step 1 – Wycliff Road/Lake Boone Trail Diversion

Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 1,600 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 400 that travel to and from I-440 northeast of the project area were moved to the new connection.

Step 2 – Creedmoor Road to and from Glenwood Avenue Adjustment

Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,200 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,200 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

Step 3 – Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)

Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,600 trips to and from Glenwood Avenue north of the project area and 400 trips to and from Creedmoor Road north of the project area were added.

Step 4 – Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Exiting Mall) Adjustment

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that exited the mall area by making a left turn onto Blue Ridge Road in the No Build scenario were rerouted to the Crabtree Valley Mall Driveway at Marriott Drive (300 exiting and heading north, 400 exiting and heading south), Crabtree Valley Mall Drive right-in/right-out (800 exiting and heading south), new facility (800 exiting and accessing the new facility), and Crabtree Valley Mall Driveway at Homewood Banks Drive (800 exiting and heading south to the new facility).

Step 5 – Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Entering Mall)

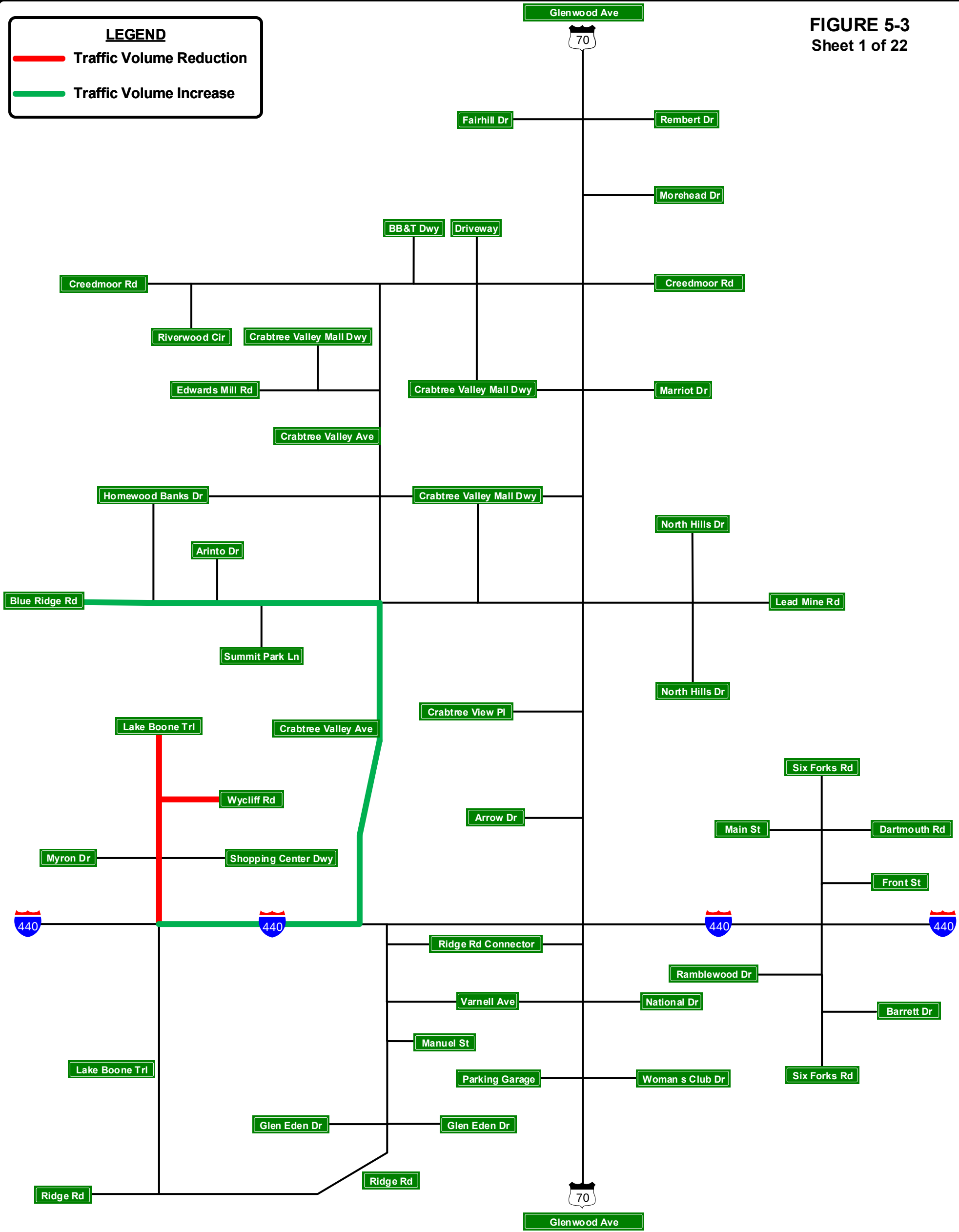
The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that entered the mall area by making a left turn from Blue Ridge Road in the No Build scenario were rerouted to the mall access at Homewood Banks Road (referred to as the southern Crabtree Valley Avenue access throughout the remainder of the report). In the 2017 Build 1 scenario, 400 trips were rerouted.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-3
Sheet 1 of 22



STEP 1

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Wycliff Road/Lake Boone Trail Diversion
Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 1,600 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 400 that travel to and from I-440 northeast of the project area were moved to the new connection.

2045

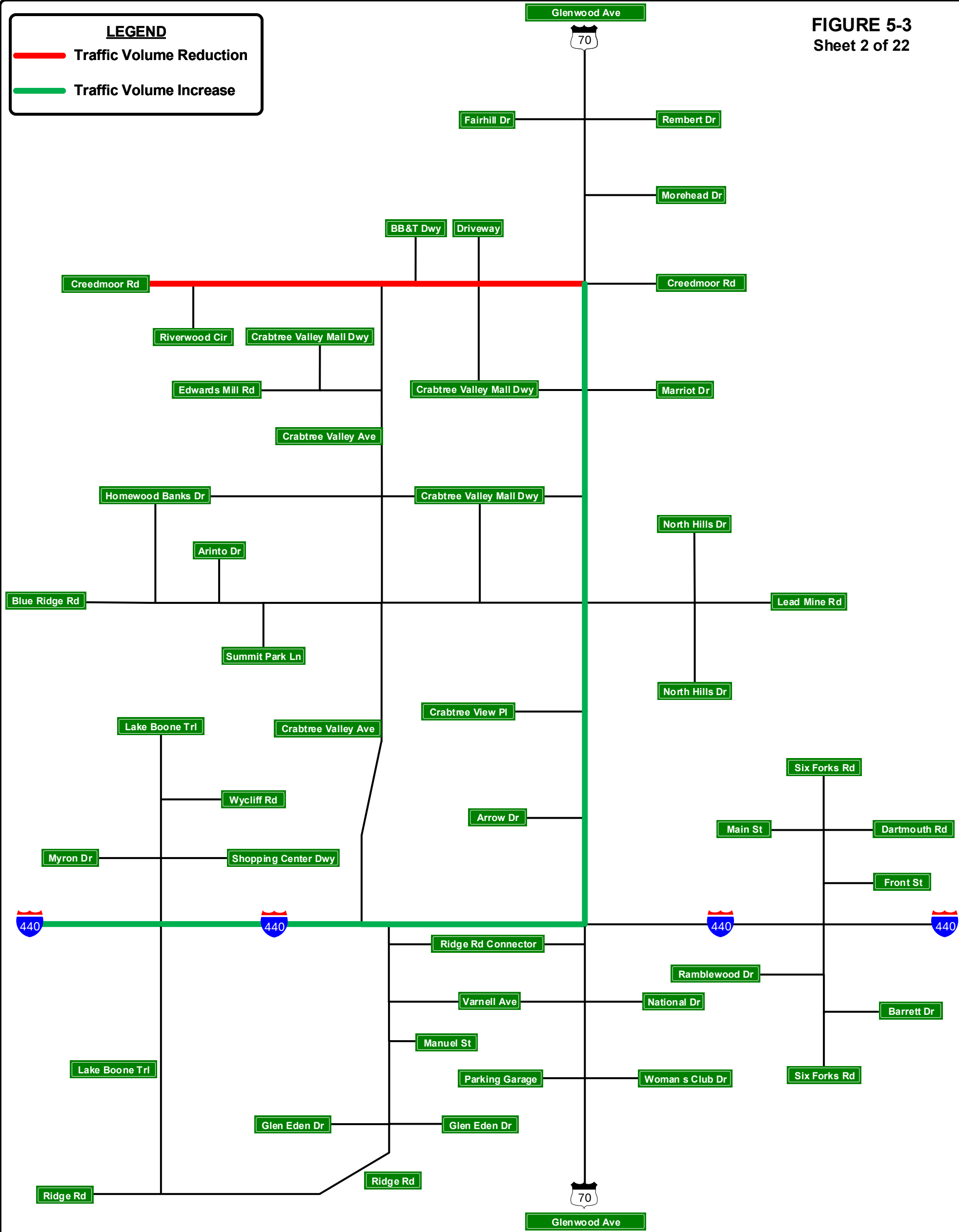
Wycliff Road/Lake Boone Trail Diversion
Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 800 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 1,200 that travel to and from I-440 northeast of the project area were moved to the new connection.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-3
Sheet 2 of 22



STEP 2

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

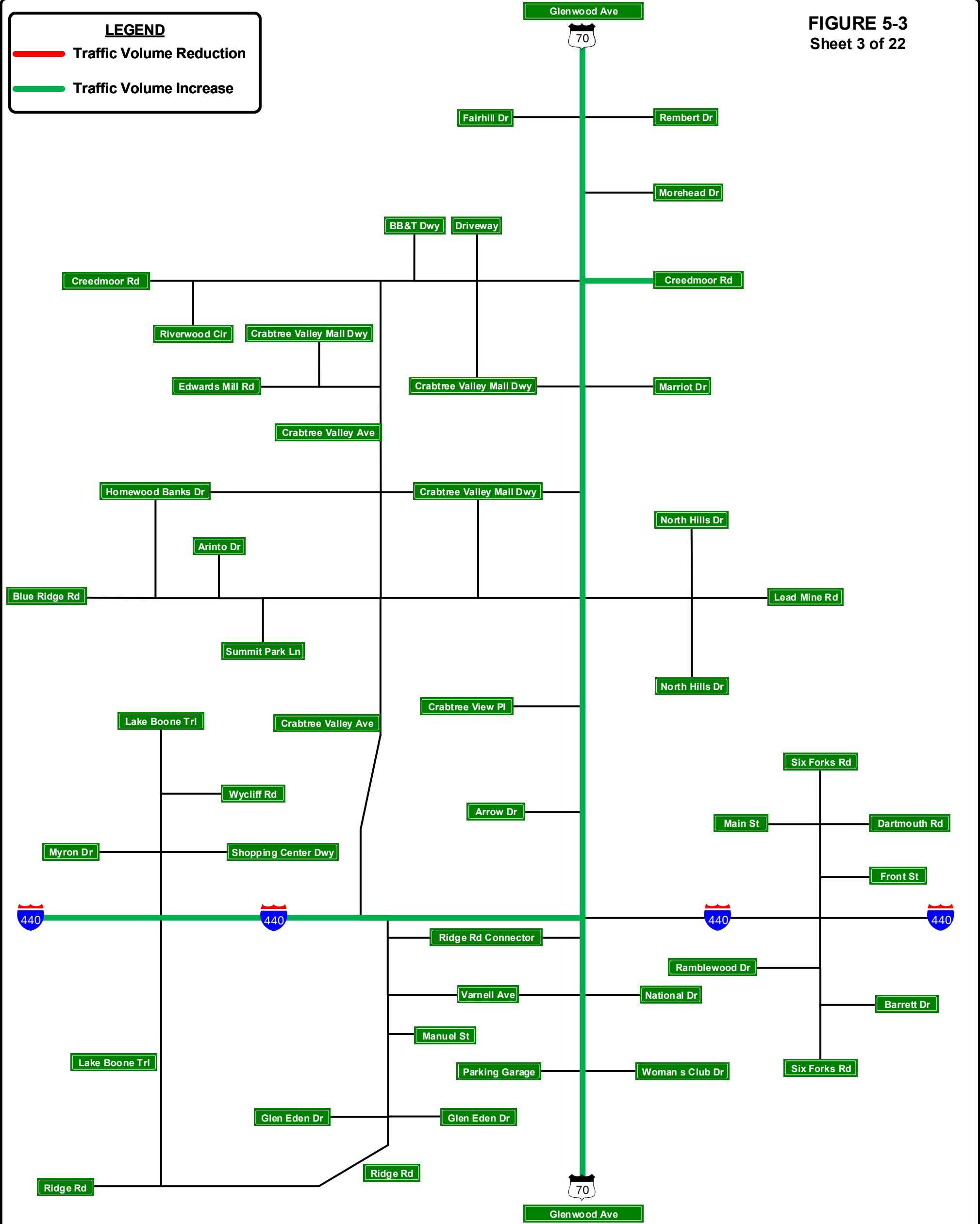
2017

Creedmoor Road to and from Glenwood Avenue Adjustment
Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,200 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,200 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

2045

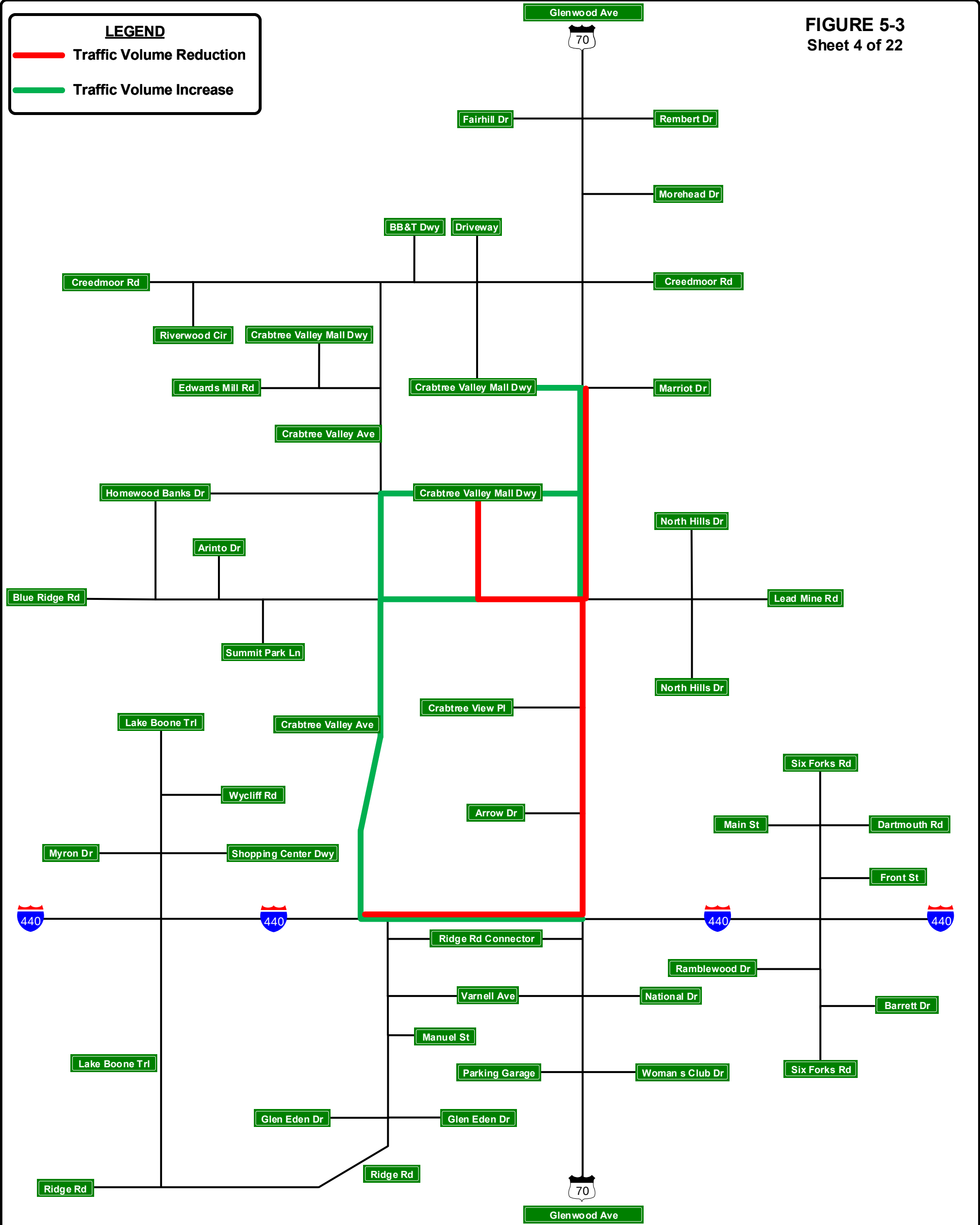
Creedmoor Road to and from Glenwood Avenue Adjustment
Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,500 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,500 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

FIGURE 5-3
Sheet 3 of 22



STEP 3		2017	2045
BUILD SCENARIO ALTERNATIVE 1		<u>Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)</u> Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,600 trips to and from Glenwood Avenue north of the project area and 400 trips to and from Creedmoor Road north of the project area were added.	<u>Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)</u> Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,800 trips to and from Glenwood Avenue north of the project area and 800 trips to and from Creedmoor Road north of the project area were added.
TIP: I-5870	WBS: 46307.1.1		
COUNTY: Wake	DIVISION: 5		
PREPARED BY: Patriot Transportation Engineering, PLLC			
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange			

FIGURE 5-3
Sheet 4 of 22



STEP 4

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Exiting Mall) Adjustment

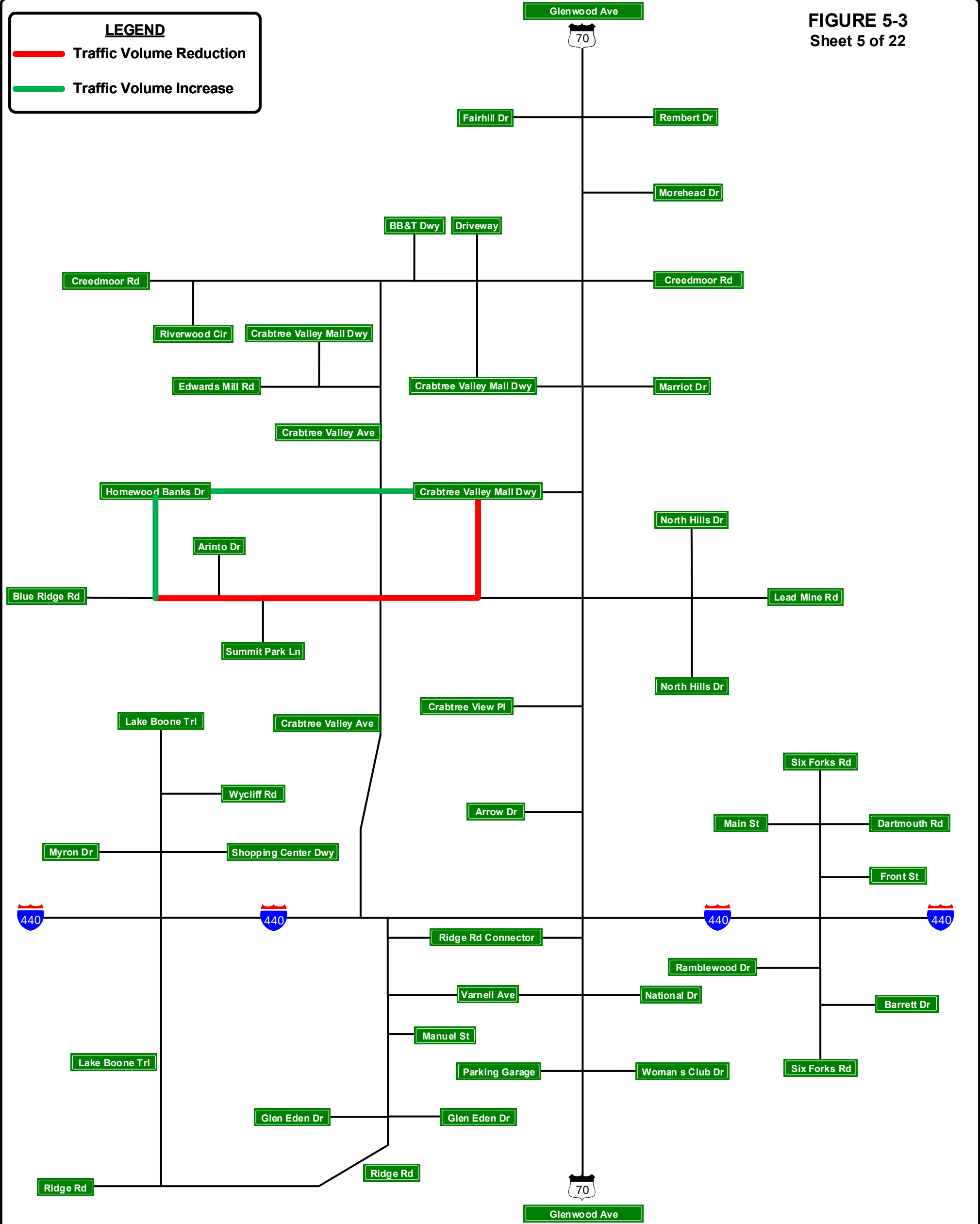
The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that exited the mall area by making a left turn onto Blue Ridge Road in the No Build scenario were rerouted to the Crabtree Valley Mall Driveway at Marriott Drive (300 exiting and heading north, 400 exiting and heading south), Crabtree Valley Mall Drive right-in/right-out (800 exiting and heading south), new facility (800 exiting and accessing the new facility), and Crabtree Valley Mall Driveway at Homewood Banks Drive (800 exiting and heading south to the new facility).

2045

Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Exiting Mall) Adjustment

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that exited the mall area by making a left turn onto Blue Ridge Road in the No Build scenario were rerouted to the Crabtree Valley Mall Driveway at Marriott Drive (400 exiting and heading north, 300 exiting and heading south), Crabtree Valley Mall Drive right-in/right-out (900 exiting and heading south), new facility (900 exiting and accessing the new facility), and the Southern Crabtree Valley Avenue access (900 exiting and heading south to the new facility).

FIGURE 5-3
Sheet 5 of 22



STEP 5

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

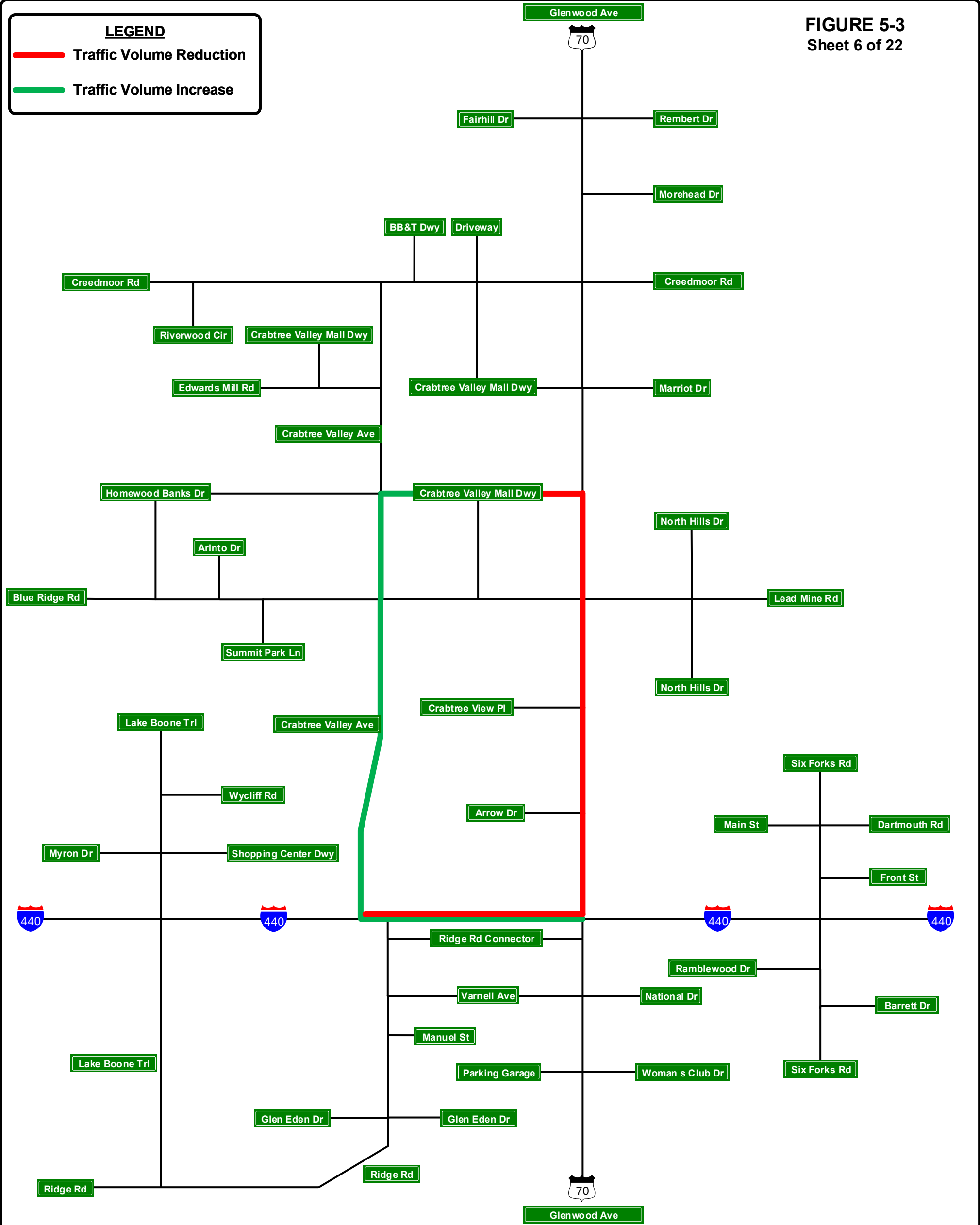
Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Entering Mall)

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that entered the mall area by making a left turn from Blue Ridge Road in the No Build scenario were rerouted to the mall access at Homewood Banks Road (referred to as the southern Crabtree Valley Avenue access throughout the remained of the report). In the 2017 Build 1 scenario, 400 trips were rerouted.

2045

Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Entering Mall)

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that entered the mall area by making a left turn from Blue Ridge Road in the No Build scenario were rerouted to the Southern Crabtree Valley Avenue access. In the 2045 Build Alternative 1 scenario, 500 trips were rerouted.



STEP 6

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

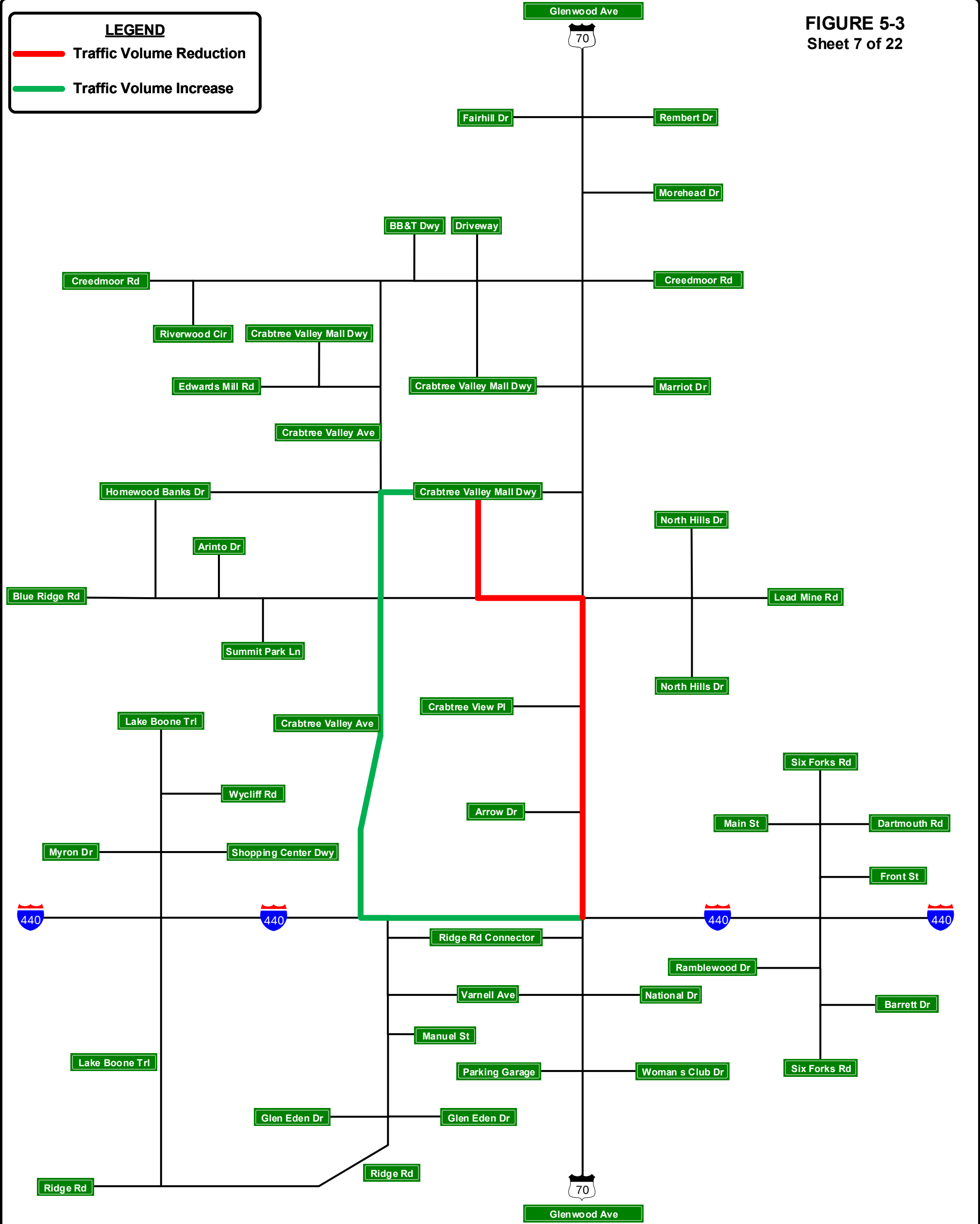
Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. This new path would allow these trips to exit the mall area at the southern Crabtree Valley Avenue access. In the 2017 Build Alternative 1 scenario, 500 trips were moved to this path. Of those, 400 were assumed to be destined for I-440 westbound while 100 were assumed to be headed to I-440 eastbound.

2045

Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. This new path would allow these trips to exit the mall area at the Southern Crabtree Valley Avenue access. In the 2045 Build Alternative 1 scenario, 600 trips were moved to this path. Of those, 400 were assumed to be destined for I-440 westbound while 200 were assumed to be headed to I-440 eastbound.



STEP 7

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

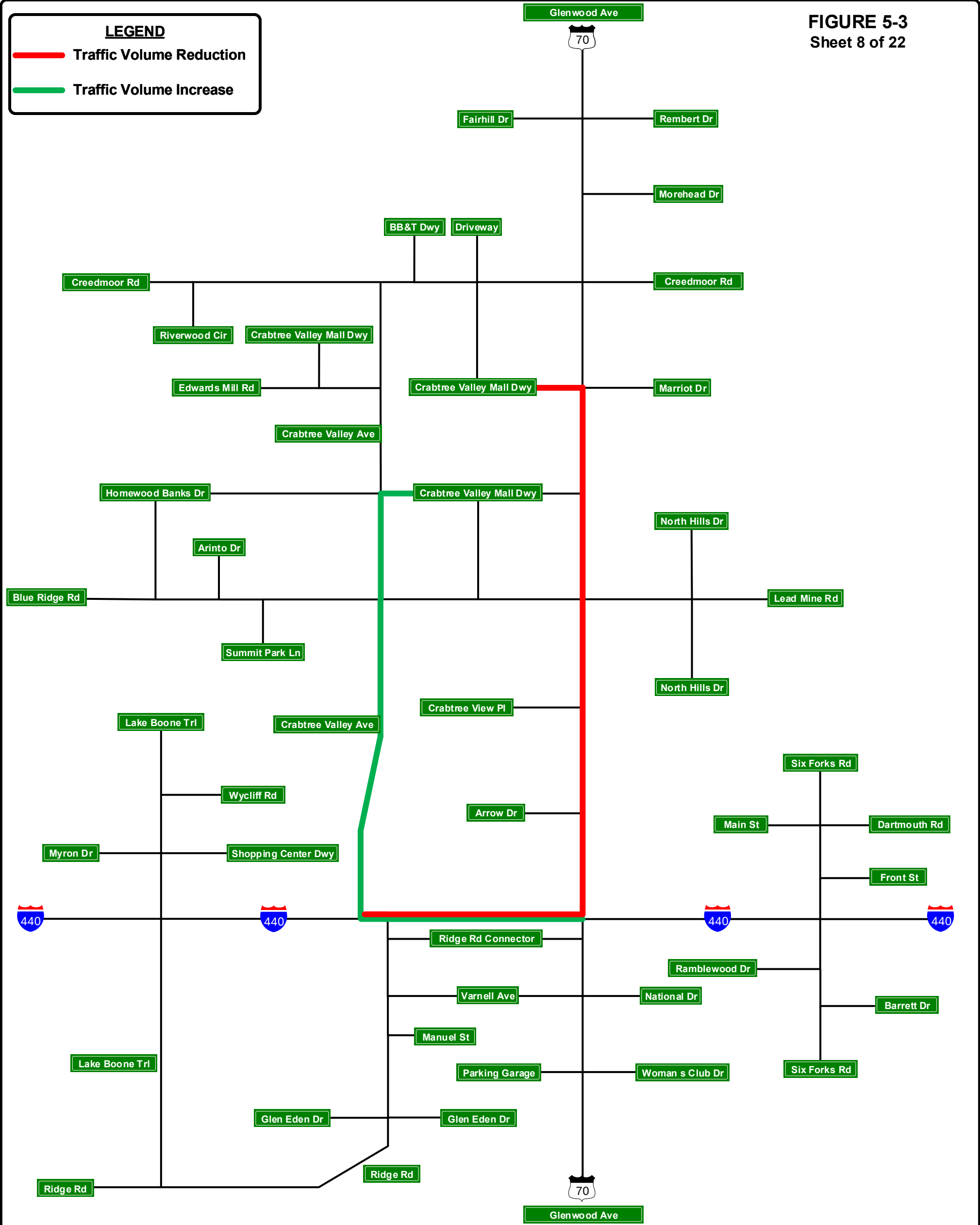
2017

Blue Ridge Road Mall Access Adjustment
The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a right turn from Blue Ridge Road in the No Build scenario. For the 2017 Build Alternative 1 scenario, 700 trips that traveled from I-440 west of the study area to access the mall from Blue Ridge Road in the No Build scenario and 700 trips that traveled from I-440 east of the study area to access the mall from Blue Ridge Road were relocated to the new facility.

2045

Blue Ridge Road Mall Access Adjustment
The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a right turn from Blue Ridge Road in the No Build scenario. For the 2045 Build Alternative 1 scenario, 800 trips that traveled from I-440 west of the study area to access the mall from Blue Ridge Road in the No Build scenario and 800 trips that traveled from I-440 east of the study area to access the mall from Blue Ridge Road were relocated to the new facility.

FIGURE 5-3
Sheet 8 of 22



STEP 8

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

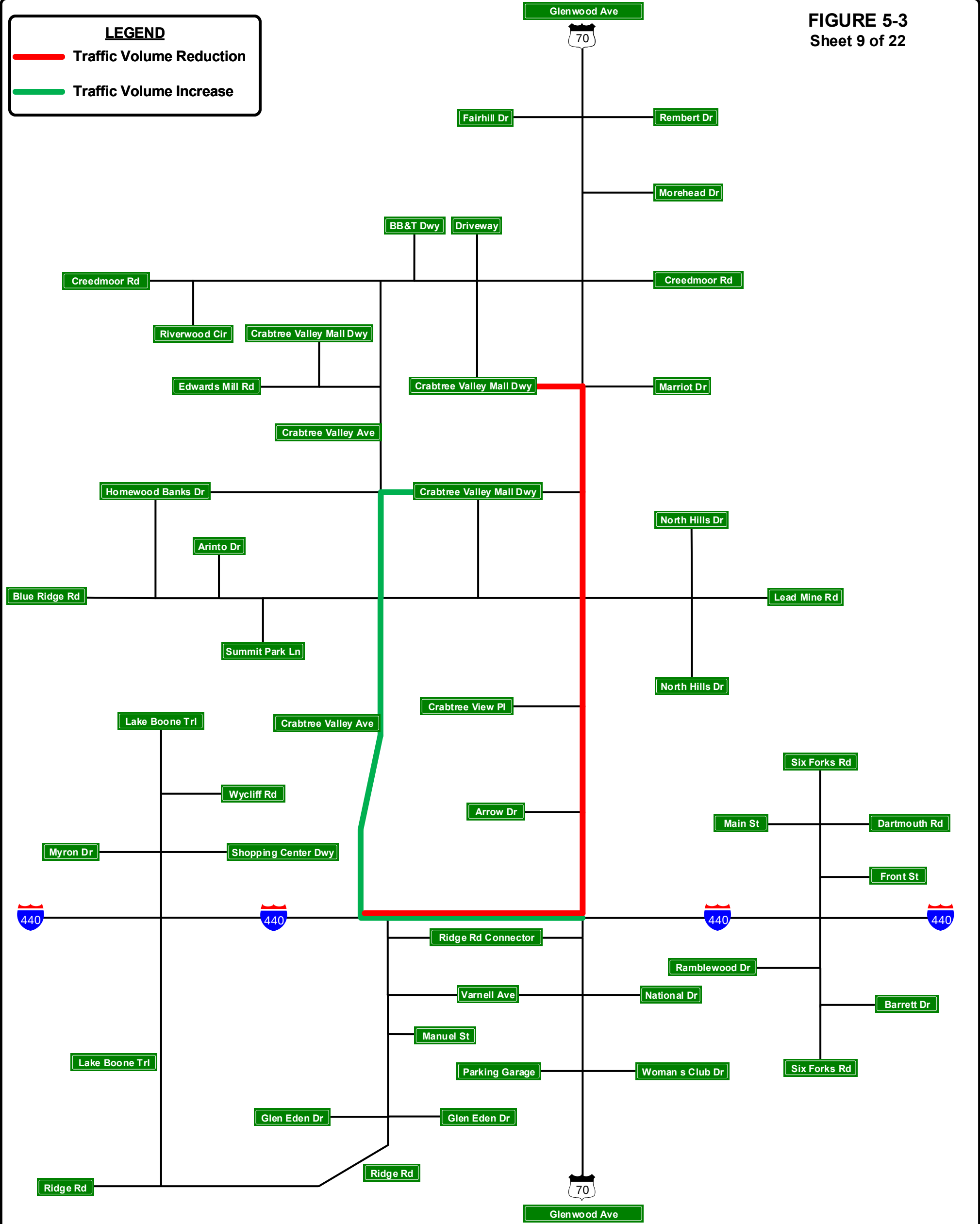
Crabtree Valley Mall Driveway at Marriott Drive
Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at Marriott Drive access in the No Build scenario. For the 2017 Build Alternative 1 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility.

2045

Crabtree Valley Mall Driveway at Marriott Drive
Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at Marriott Drive access in the No Build scenario. For the 2045 Build Alternative 1 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility.



2017

Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 1 scenario, 200 trips that traveled to I-440 west of the study area from the mall and 100 trips that traveled from I-440 east of the study area were relocated to the new facility.

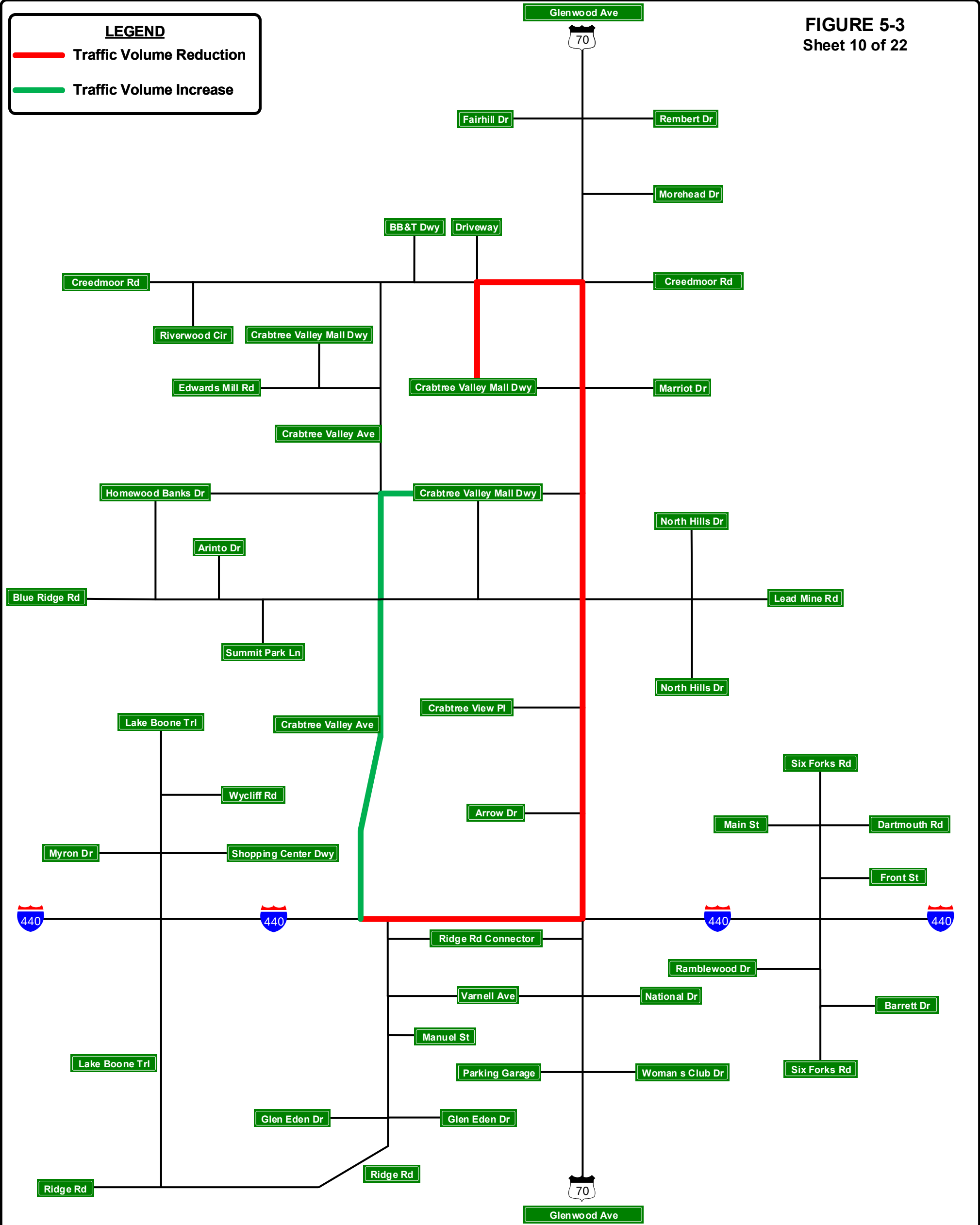
2045

Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips that traveled to I-440 west of the study area from the mall and 100 trips that traveled from I-440 east of the study area were relocated to the new facility.

STEP 9

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	



STEP 10

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

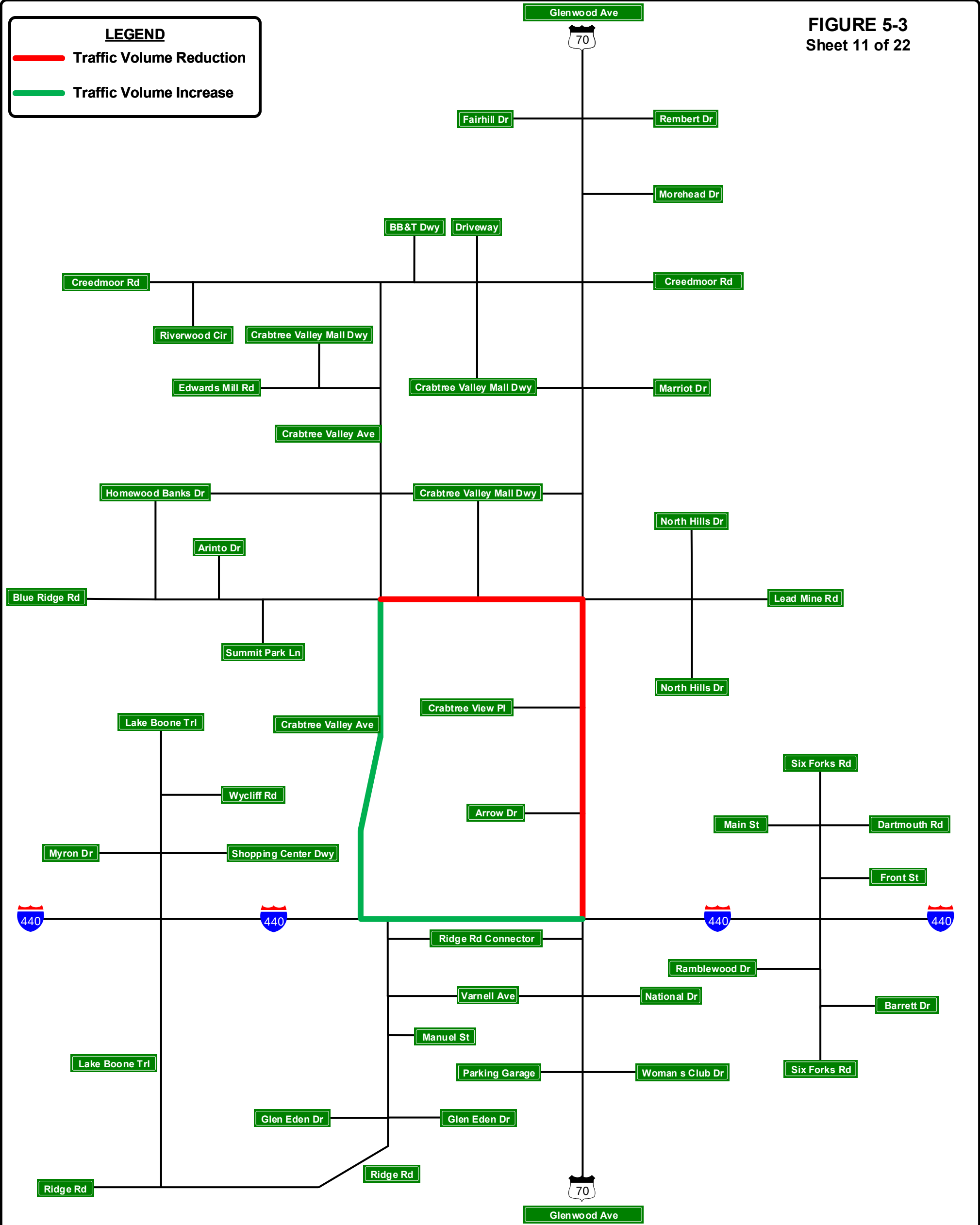
Crabtree Valley Mall Driveway from Creedmoor
Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility.

2045

Crabtree Valley Mall Driveway from Creedmoor
Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility.



STEP 11

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Southern Crabtree Valley Avenue Access Adjustment

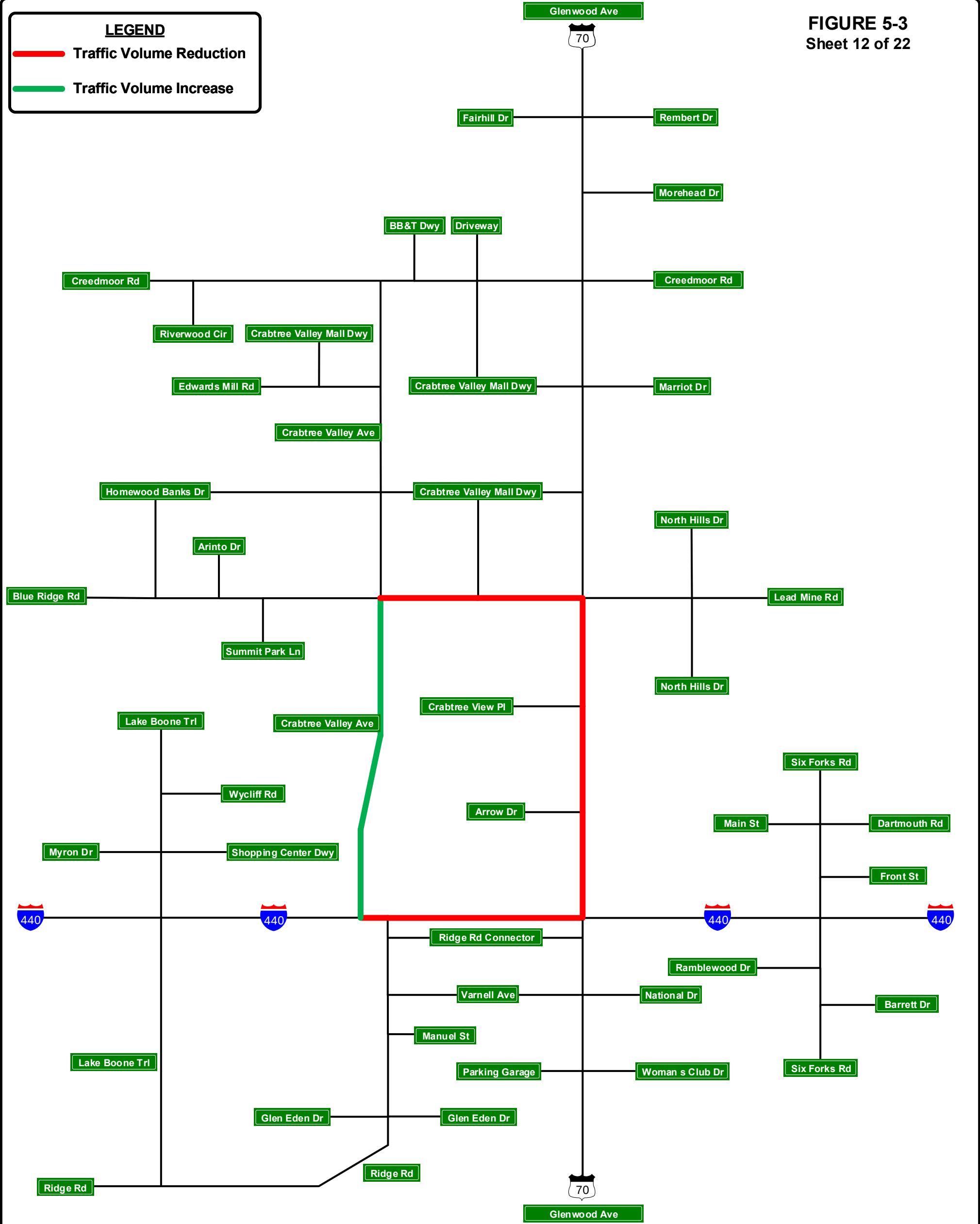
The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Mall access in the No Build scenario. For the 2017 Build Alternative 1 scenario, 200 trips that traveled from I-440 east of the study area to access the mall at this location were relocated to the new facility.

2045

Southern Crabtree Valley Avenue Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2045 Build Alternative 1 scenario, 400 trips that traveled from I-440 east of the study area to access the mall at this location were relocated to the new facility.

FIGURE 5-3
Sheet 12 of 22



STEP 12

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

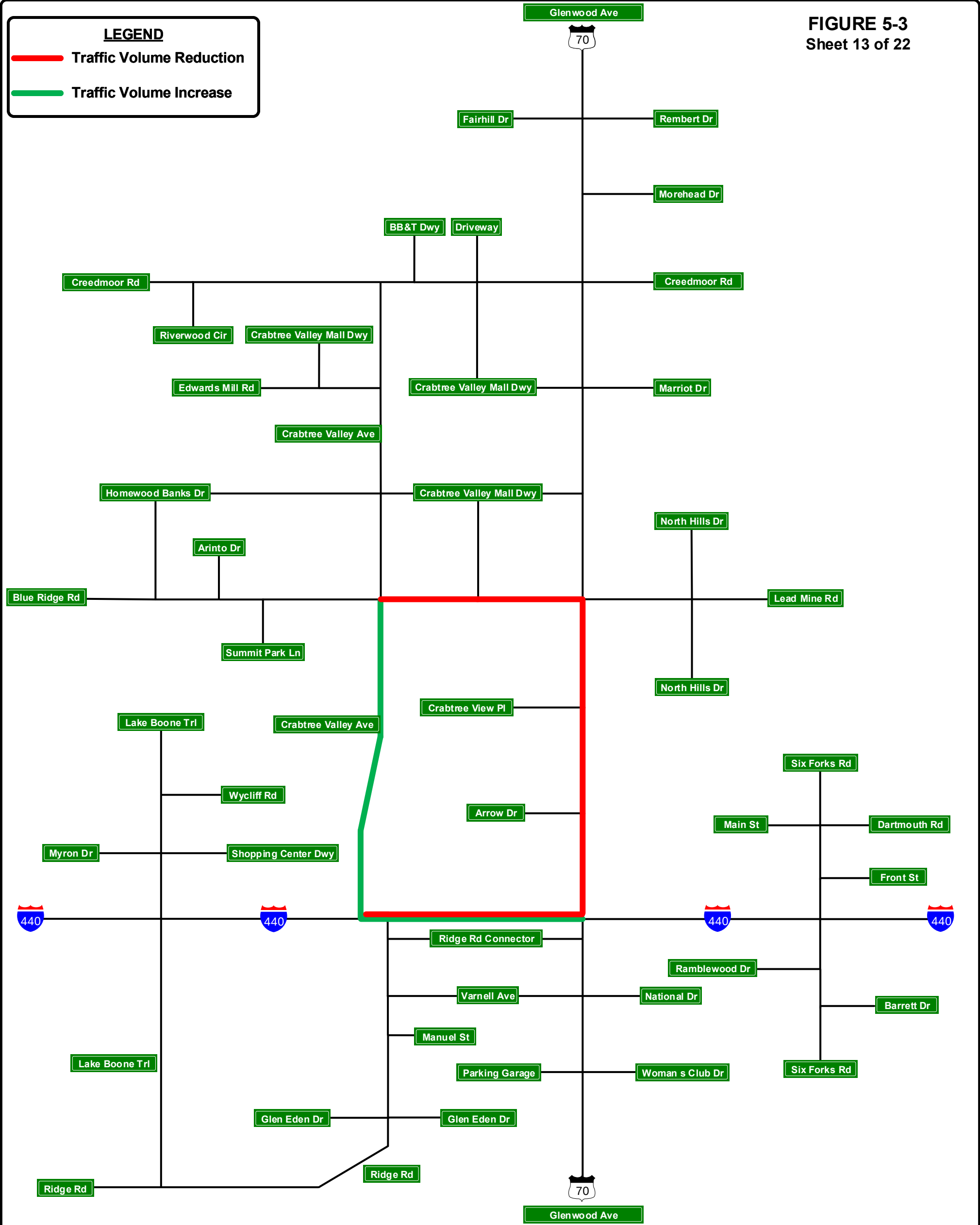
Crabtree Valley Mall Driveway at Edwards Mill Road
Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the mall access at Edwards Mill Road (this driveway will be referred to as the northern Crabtree Valley Avenue access throughout the report) headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips were relocated to the new facility.

2045

Northern Crabtree Valley Avenue Access Exit
Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips were relocated to the new facility.



STEP 13

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

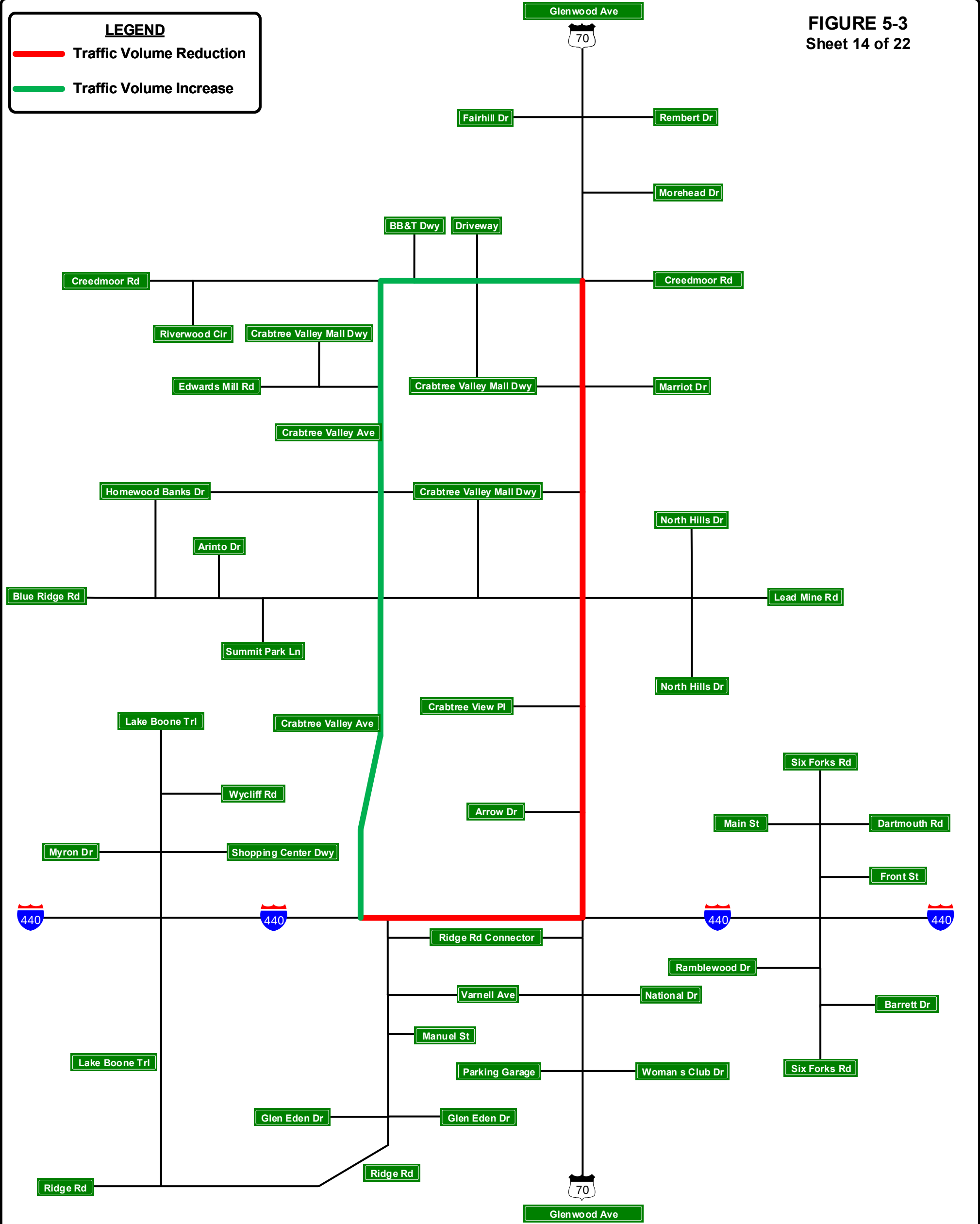
Southern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the Southern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440.

2045

Southern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the Southern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2045 Build Alternative 1 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440.



STEP 14

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Creedmoor to I-440 Westbound Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,400 trips that accessed I-440 westbound from Creedmoor Road using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor then travel to I-440 westbound at the interchange of the new facility and I-440.

2045

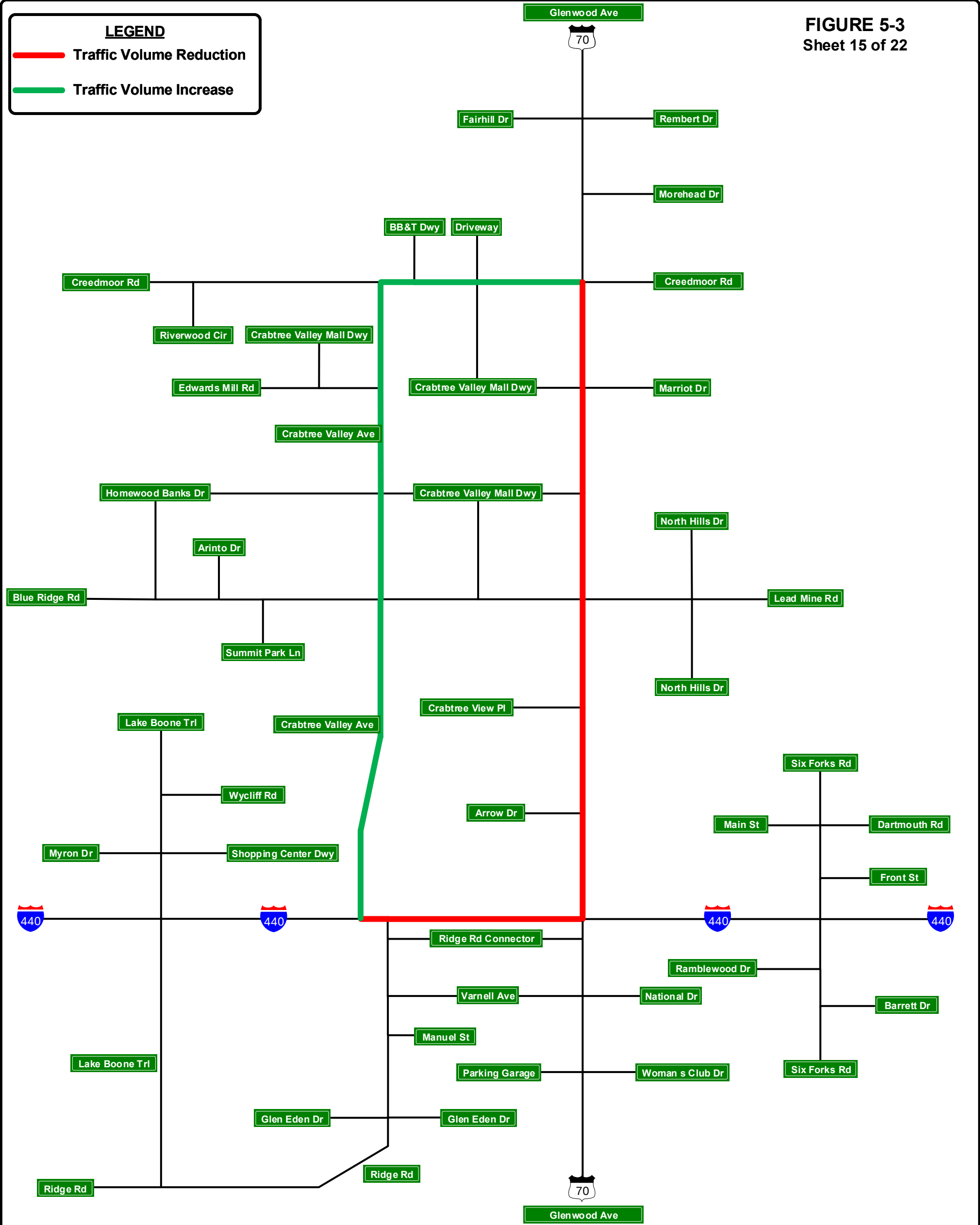
Creedmoor to I-440 Westbound Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,800 trips that accessed I-440 westbound from Creedmoor Road using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor then travel to I-440 westbound at the interchange of the new facility and I-440.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-3
Sheet 15 of 22



STEP 15

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

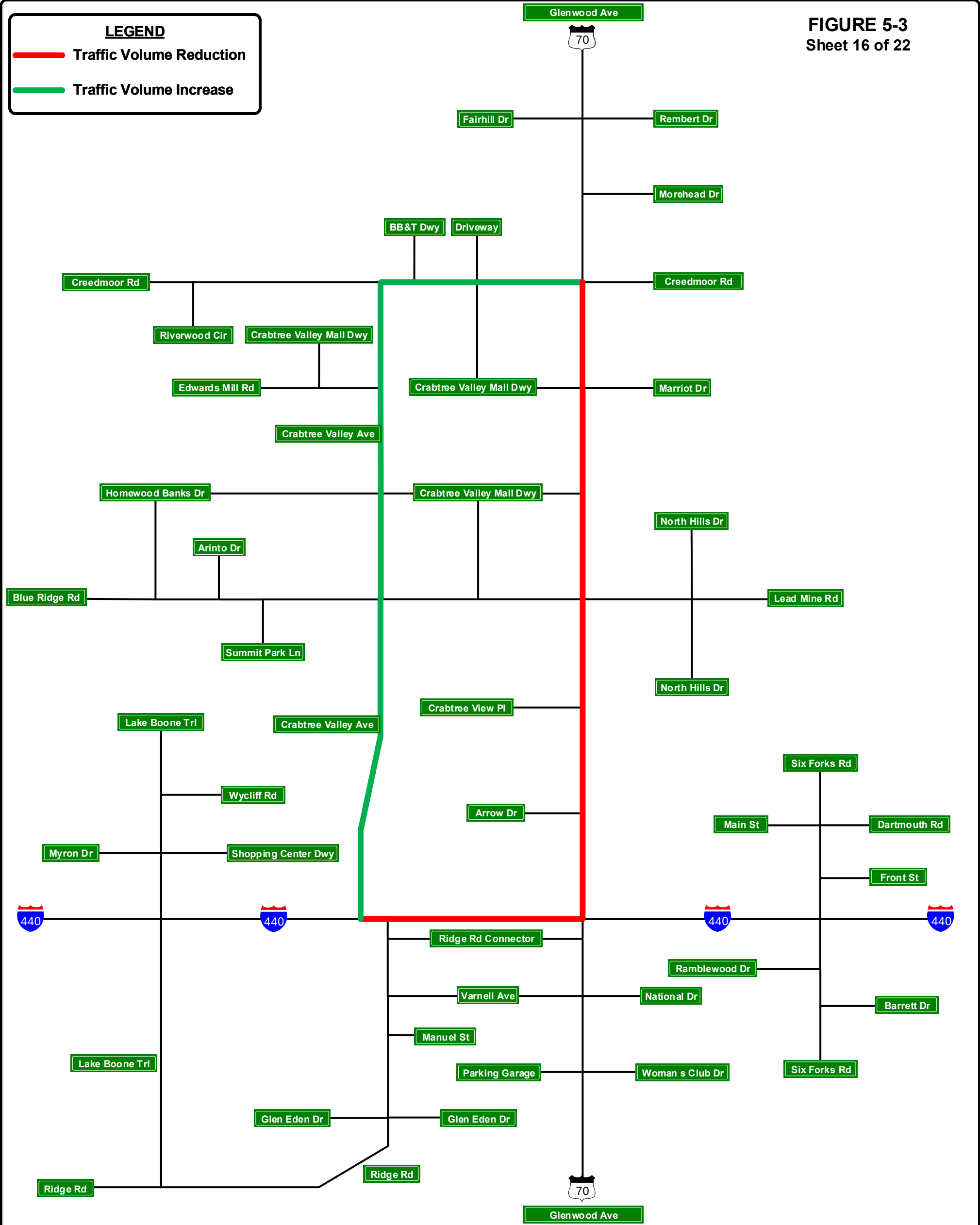
2017

Creedmoor from I-440 Eastbound Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,400 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound.

2045

Creedmoor from I-440 Eastbound Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,800 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound.

FIGURE 5-3
Sheet 16 of 22



STEP 16

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

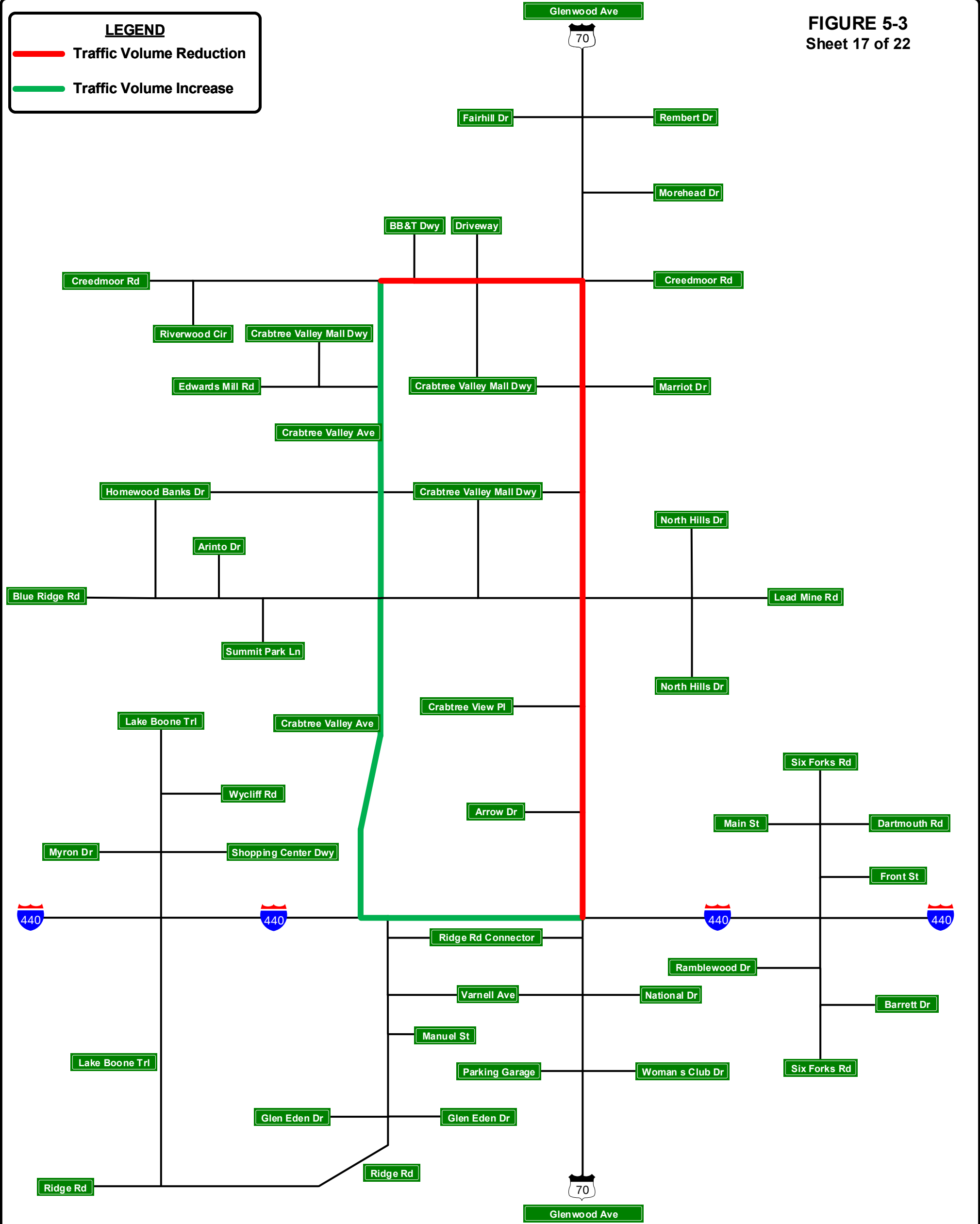
2017

Glenwood Road to and from I-440 West Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,000 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

2045

Glenwood Road to and from I-440 West Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,200 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

FIGURE 5-3
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2017

Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 400 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 400 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road.

2045

Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 500 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 500 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road.

STEP 17

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 400 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 400 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road.

Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

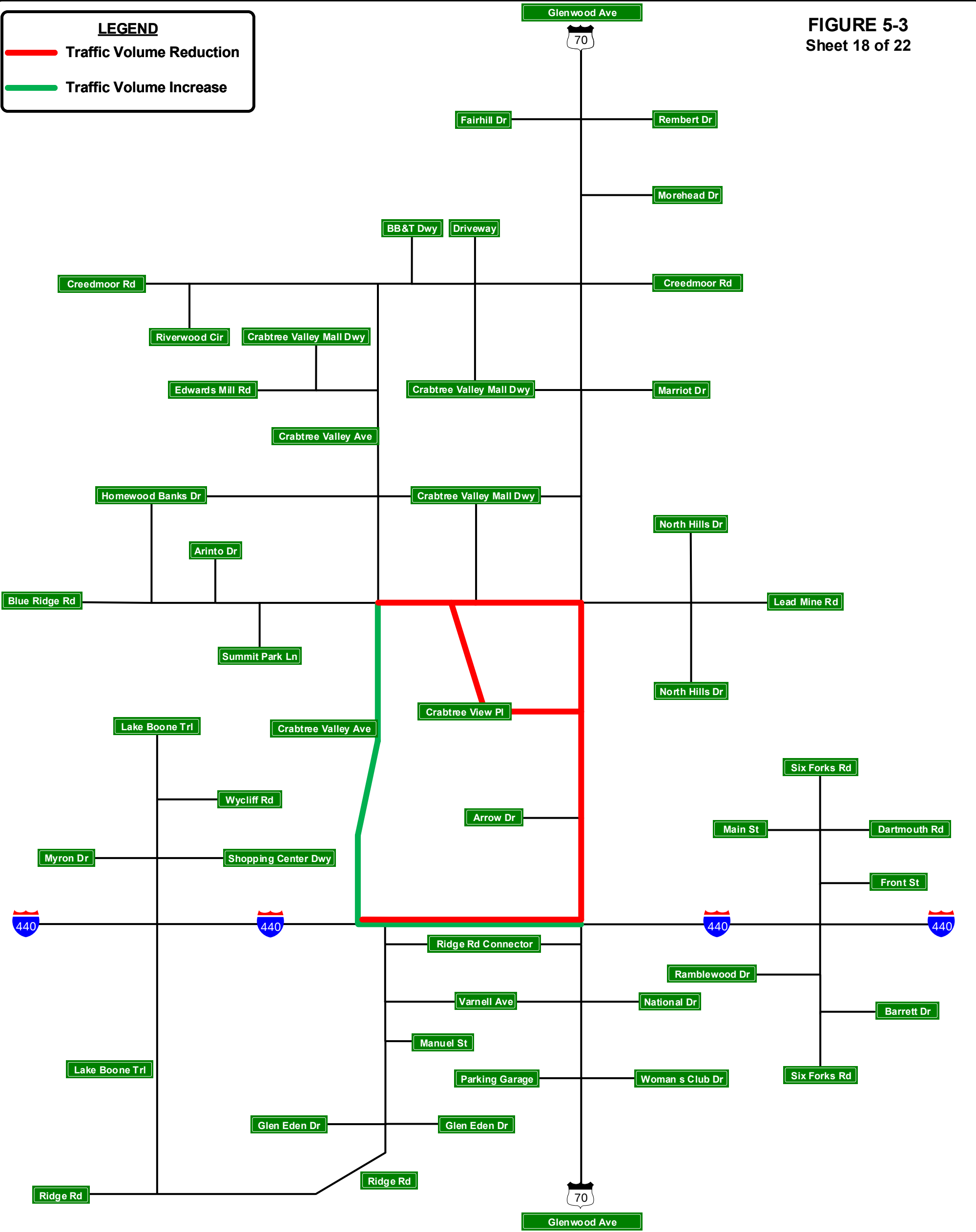
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 500 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 500 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-3
Sheet 18 of 22



STEP 18

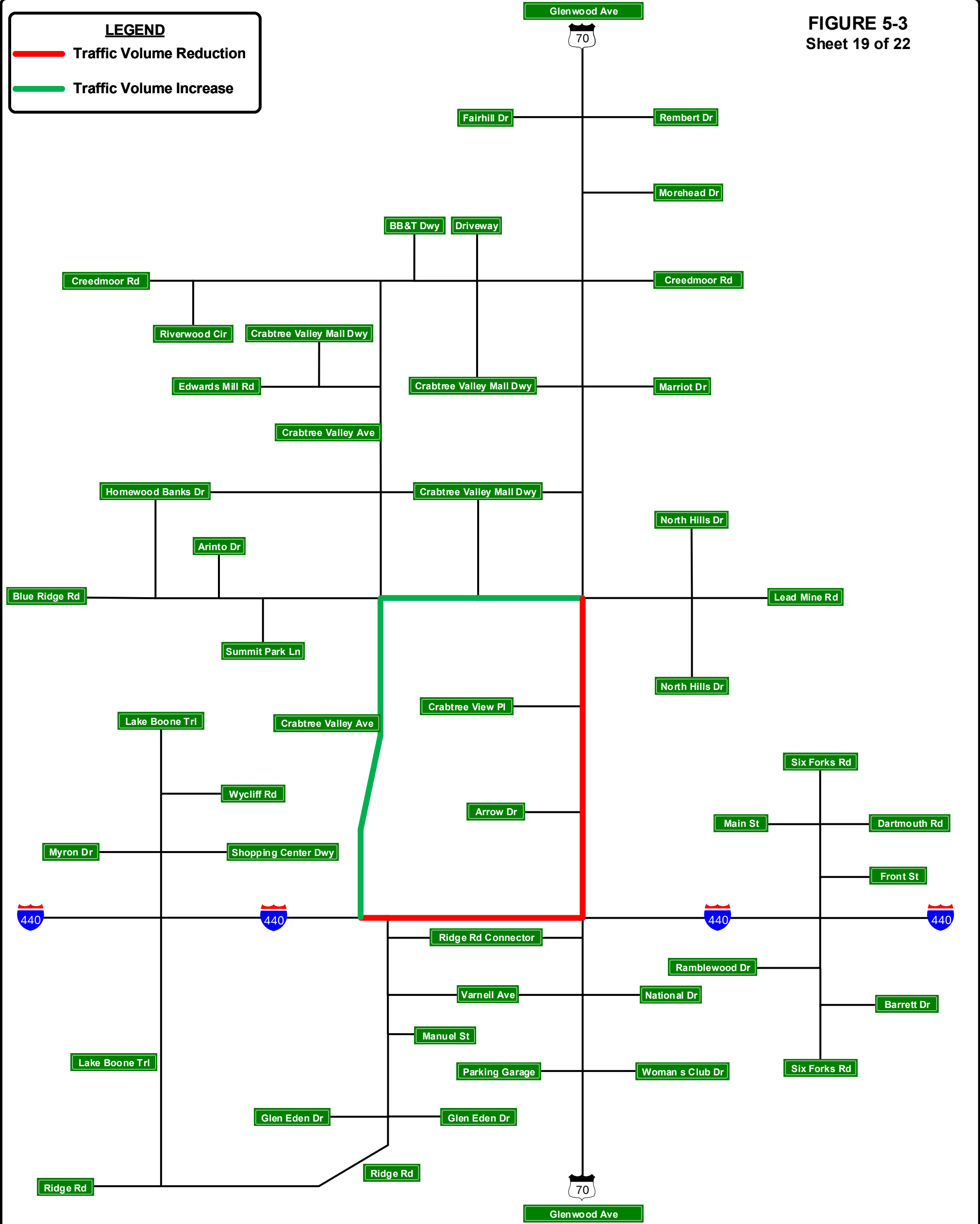
BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Crabtree View Place to I-440 Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,100 trips that accessed I-440 east of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel eastbound in the No Build scenario will now access the new facility then travel eastbound on I-440. 1,100 trips that travel from I-440 westbound to Crabtree View Place were also relocated in a similar manner. Similarly, 700 trips that accessed I-440 west of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel westbound in the No Build scenario will now access the new facility and then travel westbound on I-440. 700 trips that travel from I-440 eastbound to access Crabtree View Place were also relocated.

2045

Crabtree View Place to I-440 Adjustment
Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,700 trips that accessed I-440 east of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel eastbound in the No Build scenario will now access the new facility then travel eastbound on I-440. 1,700 trips that travel from I-440 westbound to Crabtree View Place were also relocated in a similar manner. Similarly, 1,100 trips that accessed I-440 west of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel westbound in the No Build scenario will now access the new facility and then travel westbound on I-440. 1,100 trips that travel from I-440 eastbound to access Crabtree View Place were also relocated.



STEP 19

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

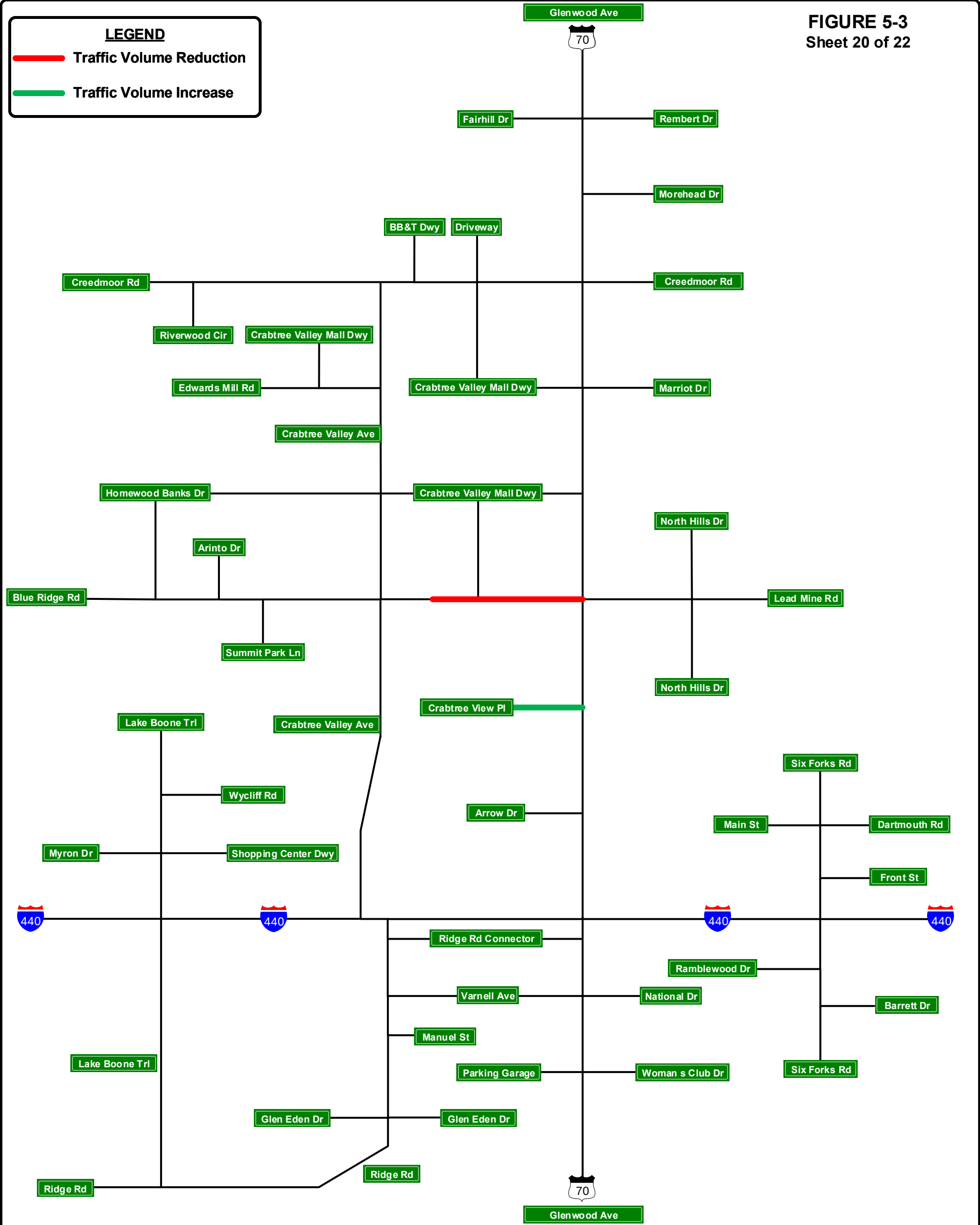
Lead Mine Road to and from I-440 West
Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 800 trips that accessed I-440 westbound from Lead Mine Road by way of Glenwood Avenue in the No Build scenario will now access the new facility from Blue Ridge Road and use the new interchange to head westbound on I-440.

2045

Lead Mine Road to and from I-440 West
Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed I-440 westbound from Lead Mine Road by way of Glenwood Avenue in the No Build scenario will now access the new facility from Blue Ridge Road and use the new interchange to head westbound on I-440.



STEP 20

BUILD SCENARIO
ALTERNATIVE 1

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Blue Ridge Road Eastbound Right-turn
Adjustment

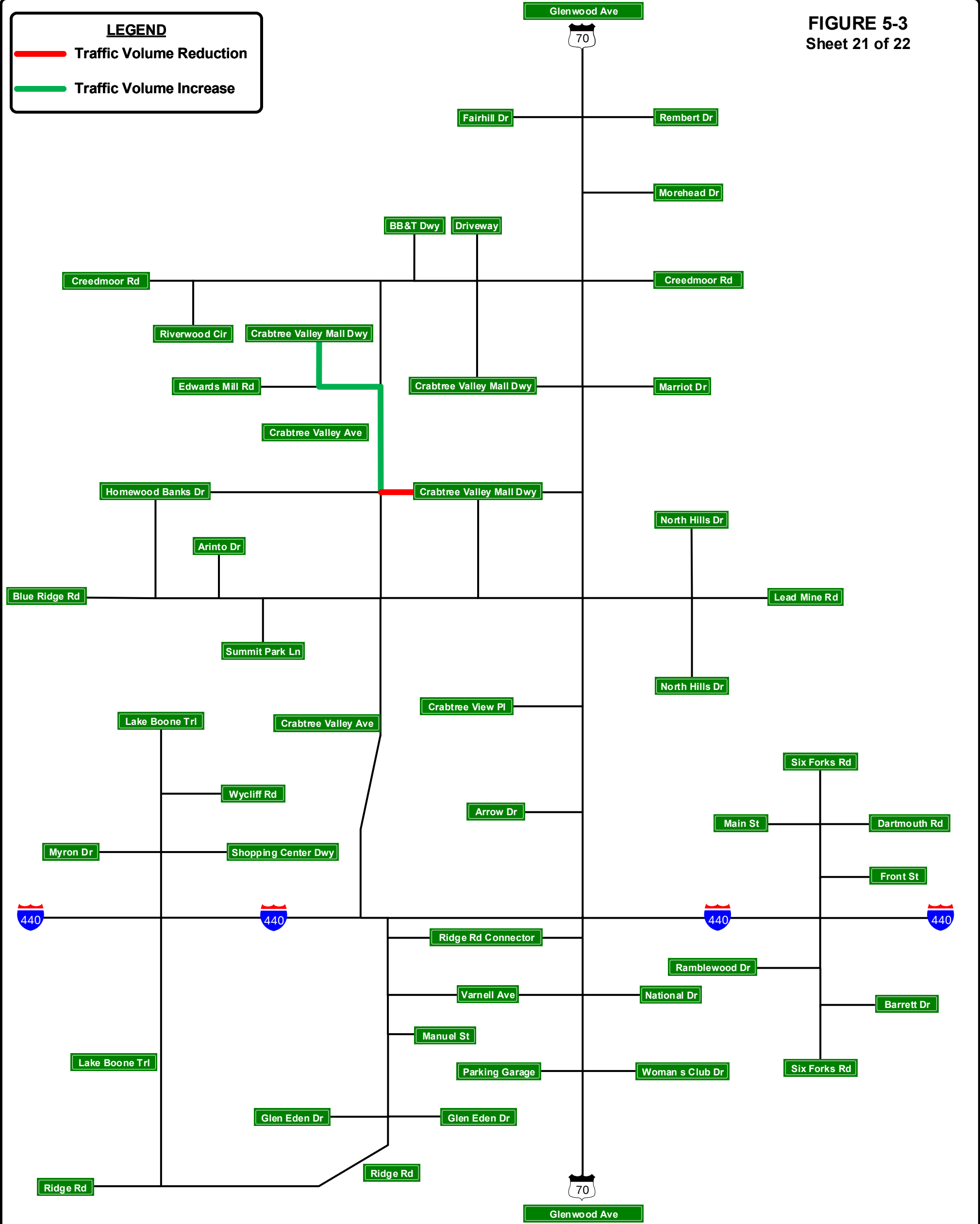
In the Alternative 1 design, trips cannot access
Glenwood Road southbound from Blue Ridge
Road eastbound. So, these trips were
relocated to Crabtree View Place. All 700
vehicles were rerouted as a result.

2045

Blue Ridge Road Eastbound Right-turn
Adjustment

In the Alternative 1 design, trips cannot access
Glenwood Road southbound from Blue Ridge
Road eastbound. So, these trips were
relocated to Crabtree View Place. All 2,100
vehicles were rerouted as a result.

FIGURE 5-3
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2017

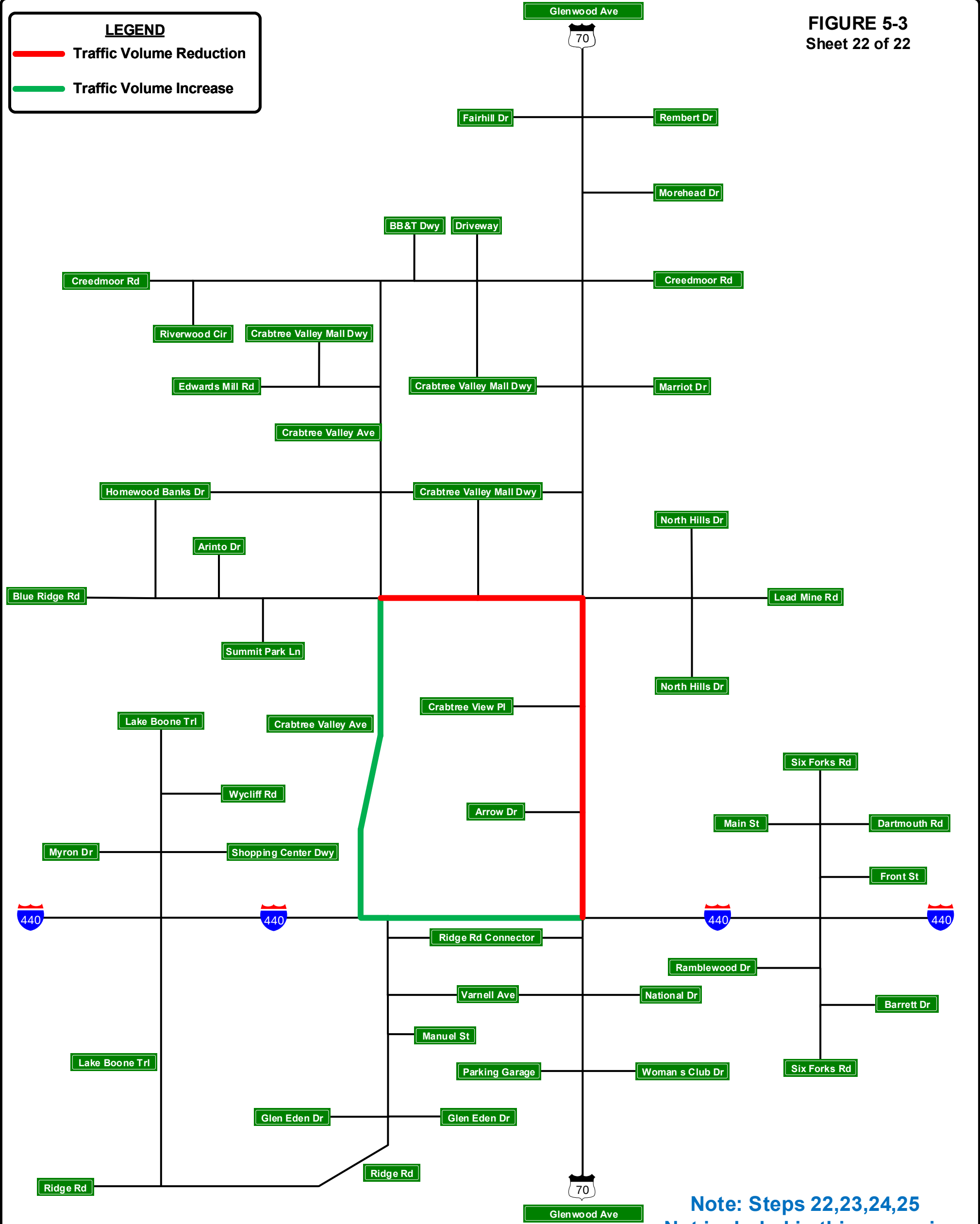
Adjust Trip Dispersion along Crabtree Valley Avenue
During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing from the northern Crabtree Valley Avenue access, 400 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access and 400 westbound lefts exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

2045

Adjust Trip Dispersion along Crabtree Valley Avenue
During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing across from the northern Crabtree Valley Avenue access, 400 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access and 400 westbound lefts exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

STEP 21

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	



STEP 26

BUILD SCENARIO ALTERNATIVE 1	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Blue Ridge Road Adjustment
After review of the forecast, it was determined that 300 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road due to the improved connectivity.

2045

Blue Ridge Road Adjustment
After review of the forecast, it was determined that 600 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road.

Step 6 – Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. This new path would allow these trips to exit the mall area at the southern Crabtree Valley Avenue access. In the 2017 Build Alternative 1 scenario, 500 trips were moved to this path. Of those, 400 were assumed to be destined for I-440 westbound while 100 were assumed to be headed to I-440 eastbound. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 7 – Blue Ridge Road Mall Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a right turn from Blue Ridge Road in the No Build scenario. For the 2017 Build Alternative 1 scenario, 700 trips that traveled from I-440 west of the study area to access the mall from Blue Ridge Road in the No Build scenario and 700 trips that traveled from I-440 east of the study area to access the mall from Blue Ridge Road were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 8 – Crabtree Valley Mall Driveway at Marriott Drive Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at Marriott Drive access in the No Build scenario. For the 2017 Build Alternative 1 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 9 – Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 1 scenario, 200 trips that traveled to I-440 west of the study area from the mall and 100 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 10 – Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 11 – Southern Crabtree Valley Avenue Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Mall access in the No Build scenario. For the 2017 Build

Alternative 1 scenario, 200 trips that traveled from I-440 east of the study area to access the mall at this location were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 12 – Crabtree Valley Mall Driveway at Edwards Mill Road Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the mall access at Edwards Mill Road (this driveway will be referred to as the northern Crabtree Valley Avenue access throughout the report) headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 13 – Southern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the Southern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 1 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 14 – Creedmoor to I-440 Westbound Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,400 trips that accessed I-440 westbound from Creedmoor Road using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor then travel to I-440 westbound at the interchange of the new facility and I-440.

Step 15 – Creedmoor from I-440 Eastbound Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,400 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound.

Step 16 – Glenwood Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,000 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

Step 17 – Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 400 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 400 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valley Avenue onto Creedmoor Road.

Step 18 – Crabtree View Place to I-440 Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,100 trips that accessed I-440 east of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel eastbound in the No Build scenario will now access the new facility then travel eastbound on I-440. 1,100 trips that travel from I-440 westbound to Crabtree View Place were also relocated in a similar manner. Similarly, 700 trips that accessed I-440 west of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel westbound in the No Build scenario will now access the new facility and then travel westbound on I-440. 700 trips that travel from I-440 eastbound to access Crabtree View Place were also relocated.

Step 19 – Lead Mine Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 800 trips that accessed I-440 westbound from Lead Mine Road by way of Glenwood Avenue in the No Build scenario will now access the new facility from Blue Ridge Road and use the new interchange to head westbound on I-440.

Step 20 – Blue Ridge Road Eastbound Right-turn Adjustment

In the Alternative 1 design, trips cannot access Glenwood Road southbound from Blue Ridge Road eastbound. So, these trips were relocated to Crabtree View Place. All 700 vehicles were rerouted as a result.

Step 21 – Adjust Trip Dispersion along Crabtree Valley Avenue

During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing from the northern Crabtree Valley Avenue access, 400 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access and 400 westbound lefts exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

Step 22 – Not included in this scenario

Step 23 – Not included in this scenario

Step 24 – Not included in this scenario

Step 25 – Not included in this scenario

Step 26 – Blue Ridge Road Adjustment

After review of the forecast, it was determined that 300 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road due to the improved connectivity. This assumption was based on the assumption that some drivers might use the new facility to avoid potential congestion along US 70. The number of trips was chosen based on the judgement of the forecasters.

Step 27 – Not included in this scenario

Step 28 – Not included in this scenario

Step 29 – Not included in this scenario

Step 30 – Not included in this scenario

5.4.2 ALTERNATIVE 2

As with the development of the forecast for Alternative 1, the Triangle Regional Travel Demand Model and engineering judgment were heavily relied upon in the calculation of the 2017 Base Year Build Alternative 2 traffic volumes. Model volumes from the 2013 No-Build and Alternative 2 Build Model runs were compared, and those volume differences were used as one of the tools to manually reroute traffic based on the build scenario in order to calculate the 2017 Build Alternative 2 forecast volumes. The traffic volumes were manually rerouted using the following steps.

Trip Re-routing Due to Project

The following section details the changes to traffic patterns that result from the construction of the project. A graphical representation with the notes below is shown for each step in Figure 5-4.

Step 1 – Wycliff Drive/Lake Boone/Trail Diversion

Based on a comparison of the Build and No Build models, it doesn't appear that the diversion noted in Step 1 of the Alternative 1 scenario occurs in the Base Year Alternative 2 Scenario. As such, no change was made.

Step 2 – Creedmoor Road to and from Glenwood Avenue Adjustment

Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 400 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 400 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

Step 3 – Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)

Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,200 trips to and from Glenwood Avenue north of the project area and 200 trips to and from Creedmoor Road north of the project area were added.

Step 4 – Blue Ridge Road Exit Adjustment

Some of the trips that exited the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. In this step, 800 trips that exited the mall at the Blue Ridge Road driveway and used Glenwood Avenue to head to I-440 westbound in the No Build scenario were relocated to the new facility by way of the southern mall access at Crabtree Valley Avenue as well as 600 trips exiting and heading to I-440 eastbound and 400 trips from the mall that were destined for Glenwood Avenue south of I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 5 – Blue Ridge Road Entrance Adjustment

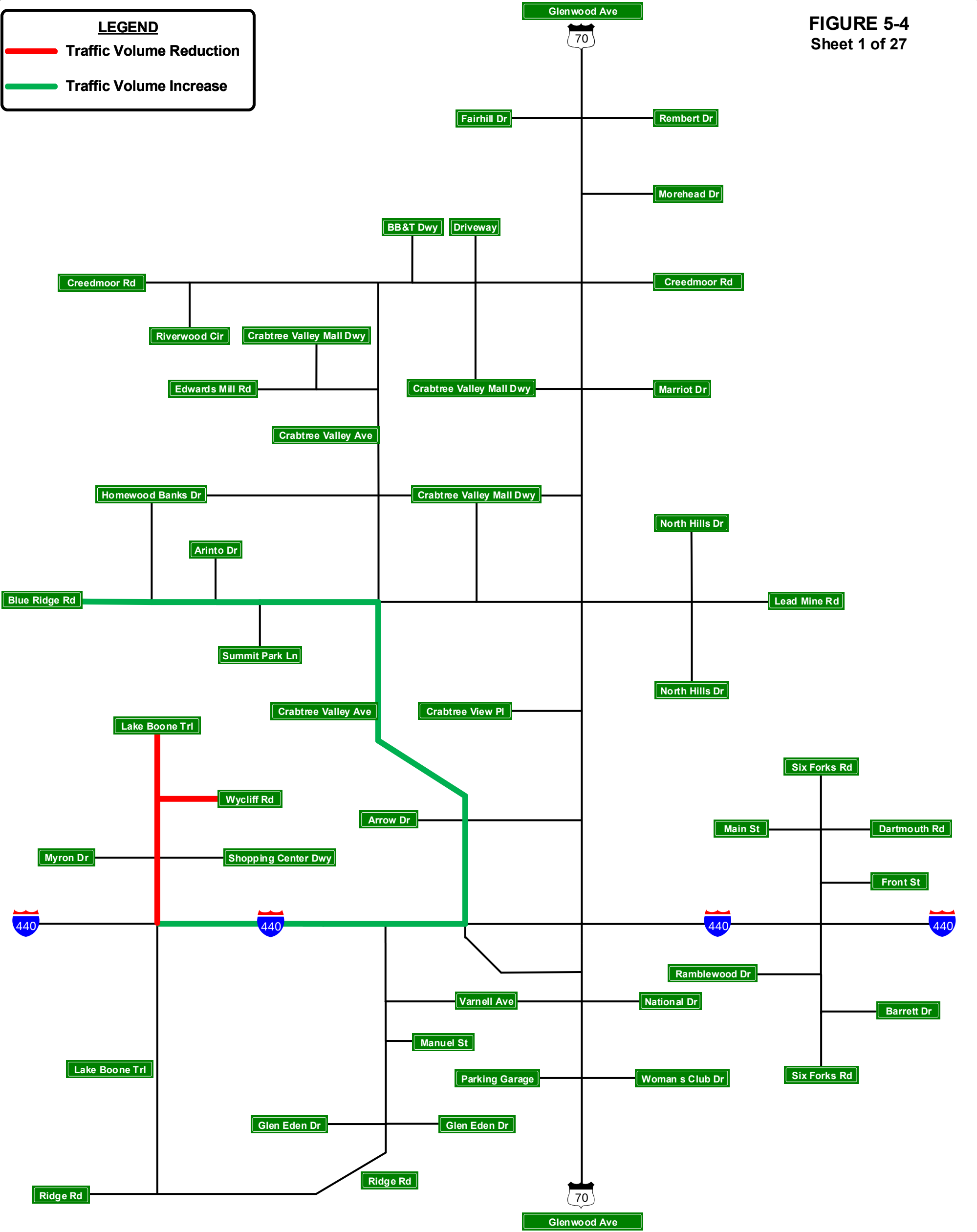
The mall access from Blue Ridge Road remains full movement in Alternative 2. However, there was still some redistribution from the path chosen in the No Build scenario. To account for the new facility, some of the trips that accessed the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 1 of 27



STEP 1

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Wycliff Drive/Lake Boone/Trail Diversion

Based on a comparison of the Build and No Build models, it doesn't appear that the diversion noted in Step 1 of the Alternative 1 scenario occurs in the Base Year Alternative 2 Scenario. As such, no change was made.

2045

Wycliff Road/Lake Boone Trail Diversion

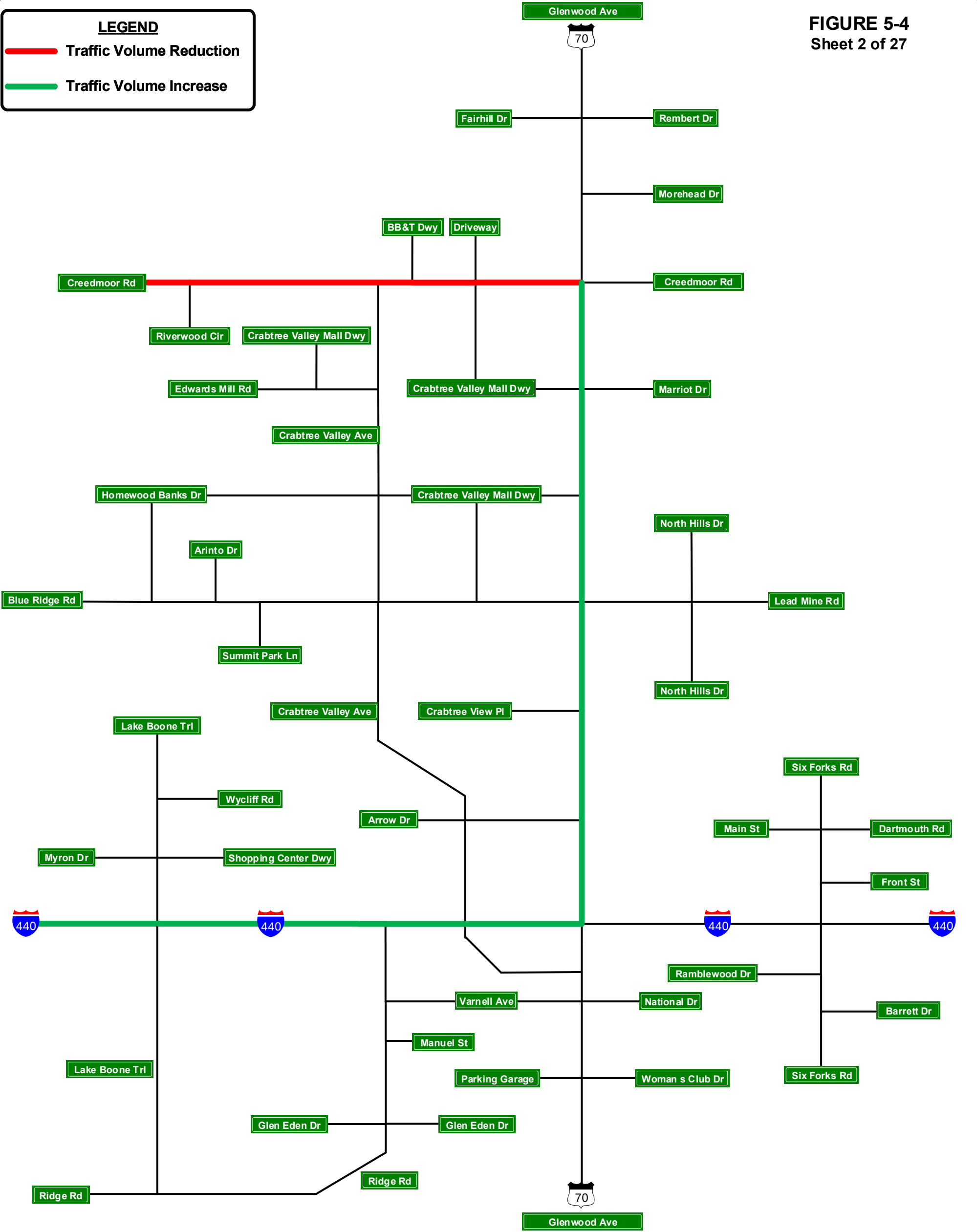
Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 1,800 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 400 that travel to and from I-440 northeast of the project area were moved to the new connection.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 2 of 27



STEP 2

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Creedmoor Road to and from Glenwood Avenue Adjustment

Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 400 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 400 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

2045

Creedmoor Road to and from Glenwood Avenue Adjustment

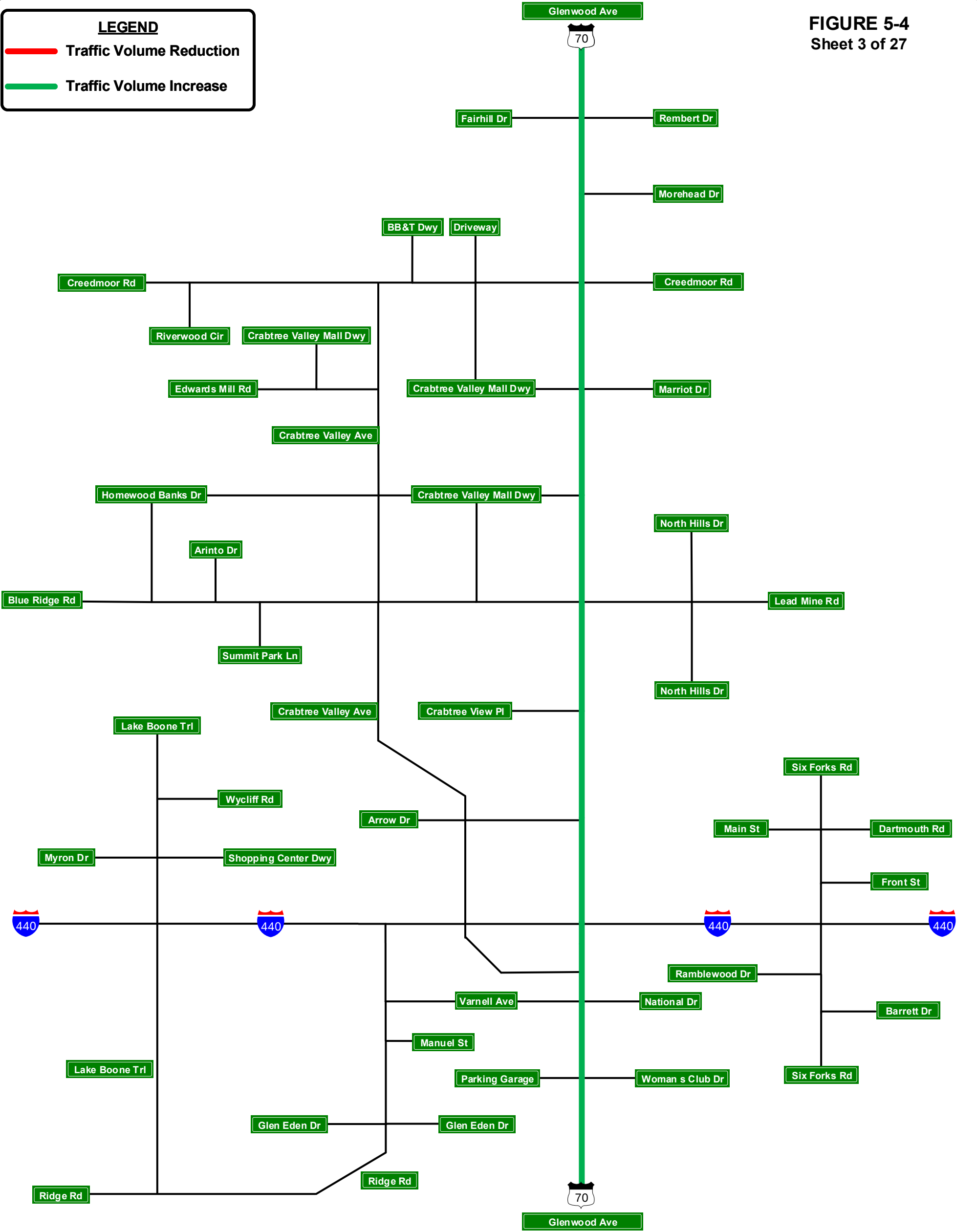
Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,200 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,200 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 3 of 27



STEP 3

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Trip Adjustment to Creedmoor Road and
Glenwood Avenue (Northeast of Project)

Based on a comparison of the Build and No
Build models, it appears that trips that were
outside of the forecast network in the No Build
scenario now take Glenwood Avenue to I-440.
Based on the calculated model diversion, 1,200
trips to and from Glenwood Avenue north of the
project area and 200 trips to and from
Creedmoor Road north of the project area were
added.

2045

Trip Adjustment to Creedmoor Road and
Glenwood Avenue (Northeast of Project)

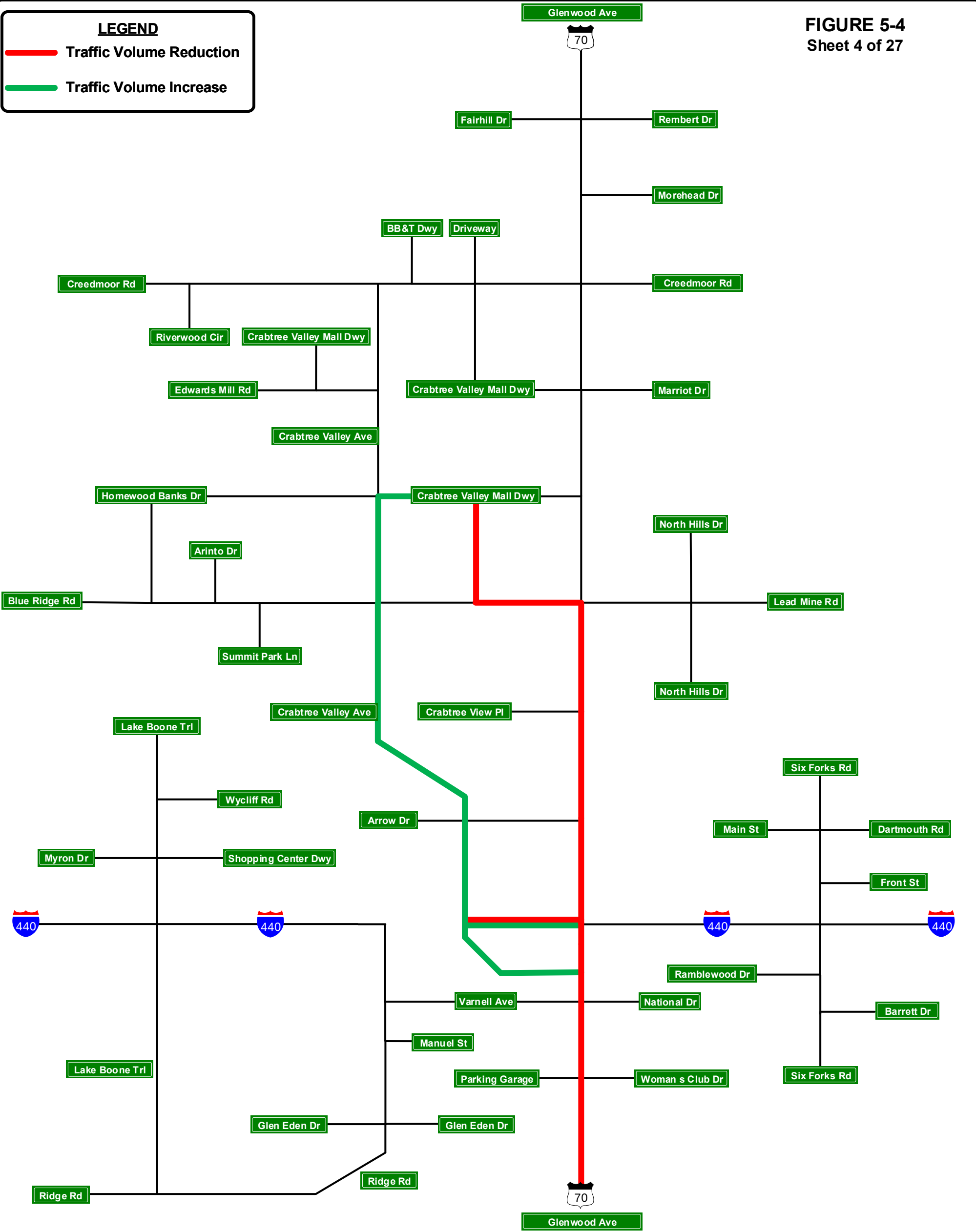
Based on a comparison of the Build and No
Build models, it appears that trips that were
outside of the forecast network in the No Build
scenario now take Glenwood Avenue to I-440.
Based on the calculated model diversion, 1,800
trips to and from Glenwood Avenue north of the
project area and 400 trips to and from
Creedmoor Road north of the project area were
added.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 4 of 27



STEP 4

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Blue Ridge Road Exit Adjustment

Some of the trips that exited the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. In this step, 800 trips that exited the mall at the Blue Ridge Road driveway and used Glenwood Avenue to head to I-440 westbound in the No Build scenario were relocated to the new facility by way of the southern mall access at Crabtree Valley Avenue as well as 600 trips exiting and heading to I-440 eastbound and 400 trips from the mall that were destined for Glenwood Avenue south of I-440.

2045

Blue Ridge Road Exit Adjustment

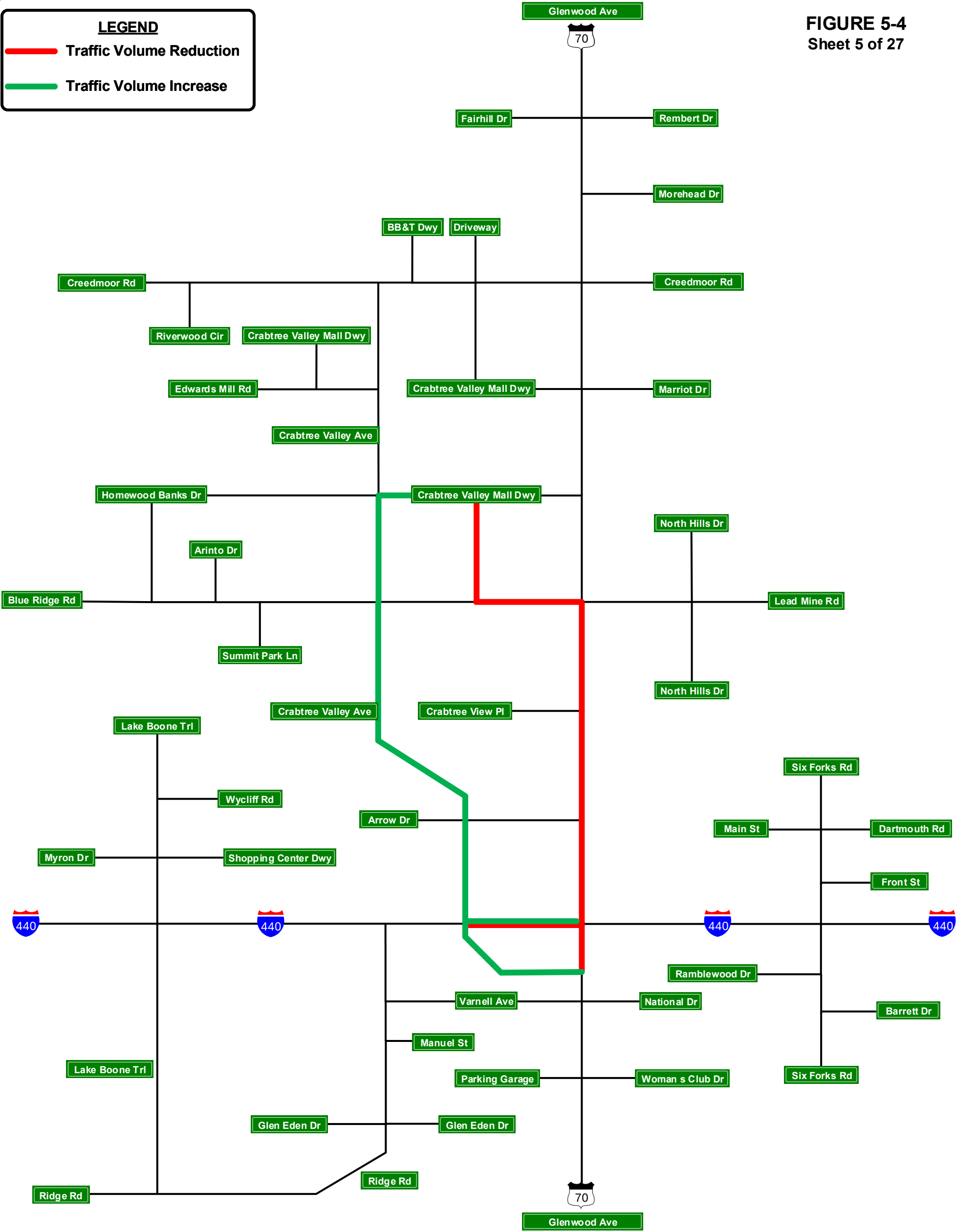
Some of the trips that exited the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. In this step, 900 trips that exited the mall at the Blue Ridge Road driveway and used Glenwood Avenue to head to I-440 westbound in the No Build scenario were relocated to the new facility by way of the southern mall access at Crabtree Valley Avenue as well as 700 trips exiting and heading to I-440 eastbound and 400 trips from the mall that were destined for Glenwood Avenue south of I-440.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 5 of 27



STEP 5

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Blue Ridge Road Entrance Adjustment

The mall access from Blue Ridge Road remains full movement in Alternative 2. However, there was still some redistribution from the path chosen in the No Build scenario. To account for the new facility, some of the trips that accessed the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. For this step, 600 trips from eastbound I-440, 1,000 trips from westbound I-440, and 1,000 trips from Glenwood Avenue south of I-440, that entered the mall at the Blue Ridge Driveway were relocated to the new facility and now enter the mall at the southern Crabtree Valley Avenue access.

2045

Blue Ridge Road Entrance Adjustment

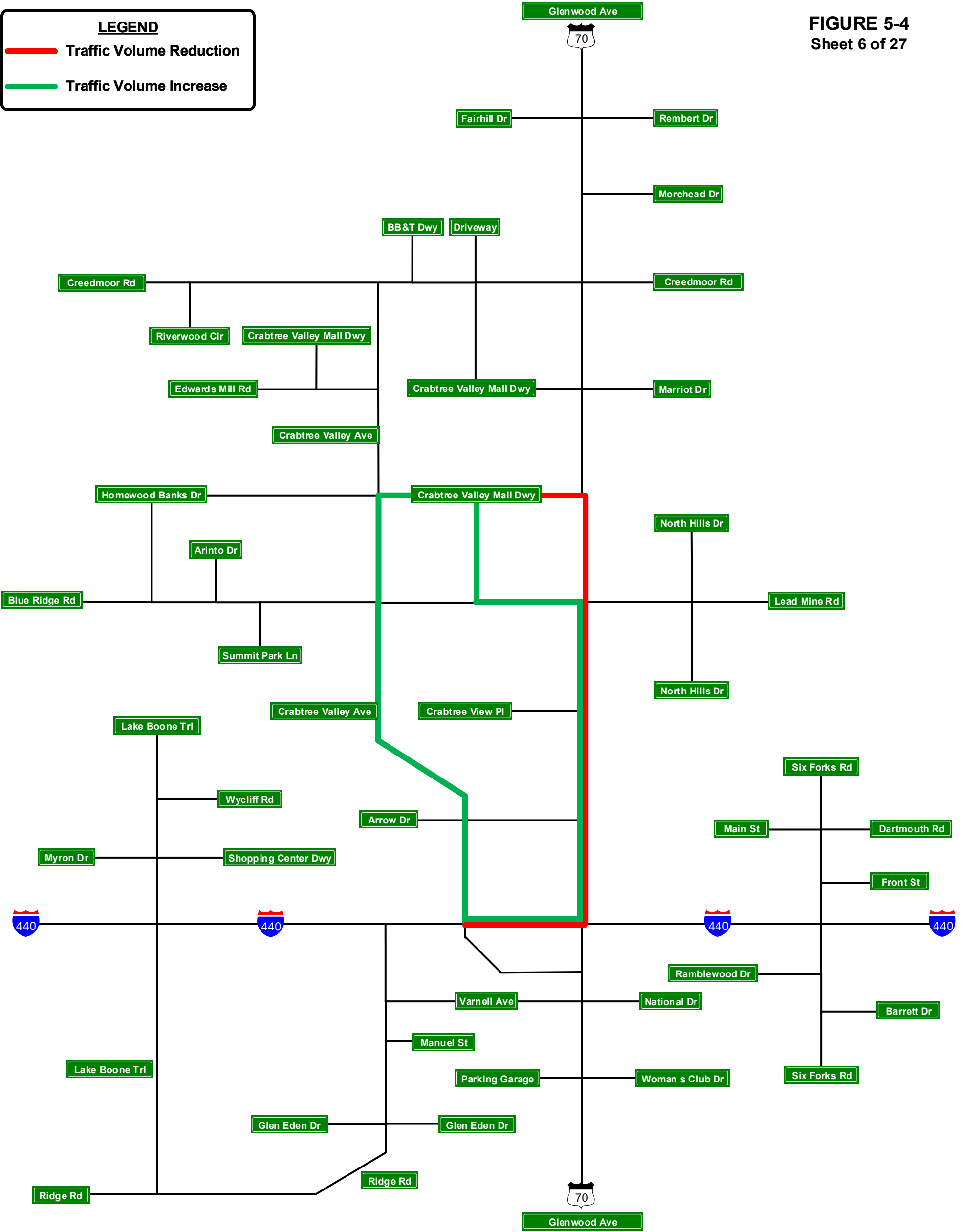
The mall access from Blue Ridge Road remains full movement in Alternative 2. However, there was still some redistribution from the path chosen in the No Build scenario. To account for the new facility, some of the trips that accessed the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. For this step, 600 trips from eastbound I-440, 1,100 trips from westbound I-440, and 1,000 trips from Glenwood Avenue south of I-440, that entered the mall at the Blue Ridge Driveway were relocated to the new facility and now enter the mall at the southern Crabtree Valley Avenue access.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 6 of 27



STEP 6

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. In this step, 500 trips were relocated from the Crabtree Valley Mall Driveway intersection with Glenwood Avenue to the southern Crabtree Valley Avenue mall access. Of those, 400 utilized the new facility to access I-440 westbound while 100 travelled to I-440 eastbound. Also, 200 of the trips exiting the mall at the Crabtree Valley Mall Driveway intersection with Glenwood Avenue in the No Build scenario were assumed to be destined for Lead Mine Road. Due to the new configuration, those trips were rerouted to the Blue Ridge Road mall driveway, and now travel to Lead Mine Road from Blue Ridge Road.

2045

Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

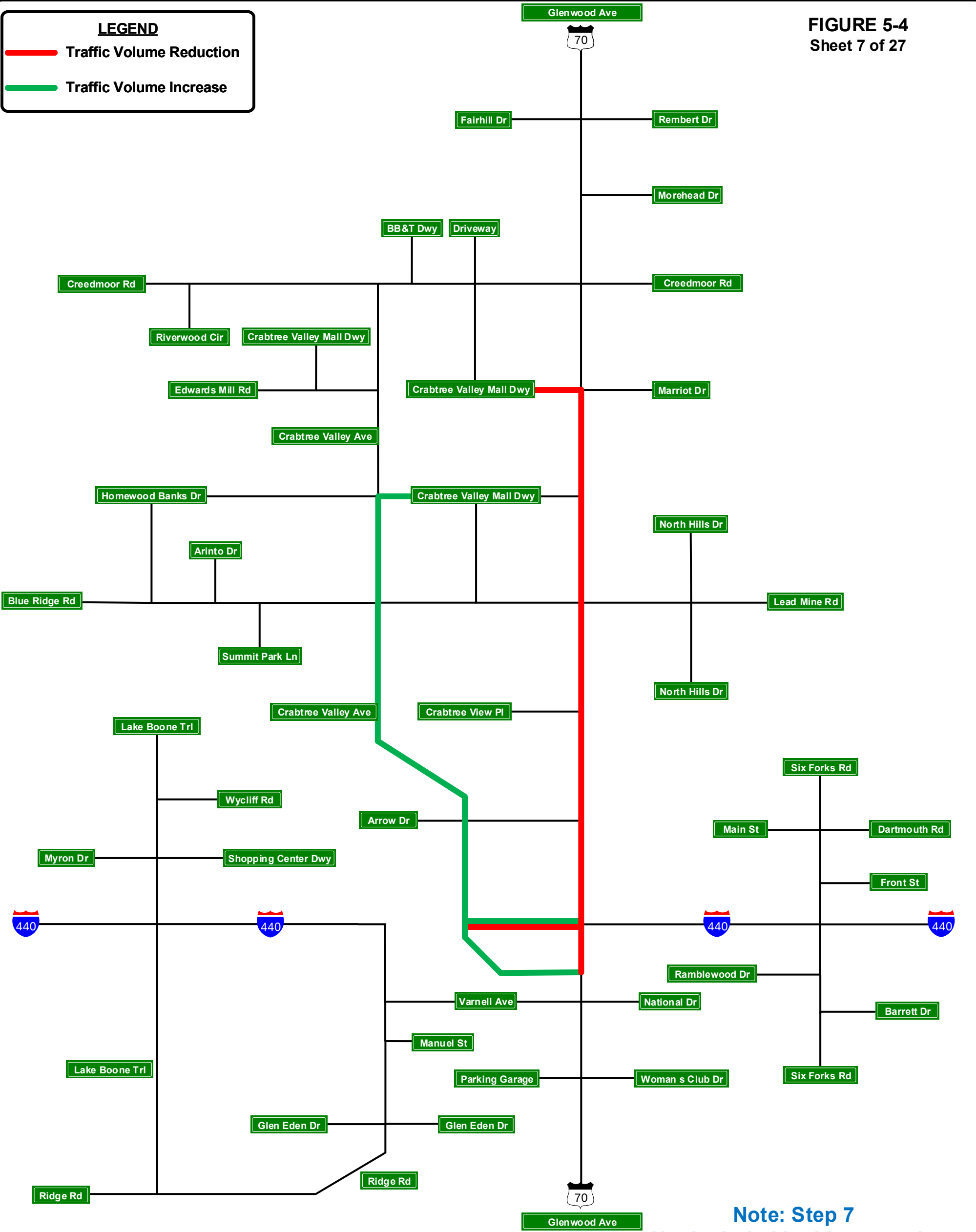
The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. In this step, 500 trips were relocated from the Crabtree Valley Mall Driveway intersection with Glenwood Avenue to the southern Crabtree Valley Avenue mall access. Of those, 400 utilized the new facility to access I-440 westbound while 100 travelled to I-440 eastbound. Also, 200 of the trips exiting the mall at the Crabtree Valley Mall Driveway intersection with Glenwood Avenue in the No Build scenario were assumed to be destined for Lead Mine Road. Due to the new configuration, those trips were rerouted to the Blue Ridge Road mall driveway, and now travel to Lead Mine Road from Blue Ridge Road.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 7 of 27



Note: Step 8
Not included in this scenario

STEP 8

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Crabtree Valley Mall Driveway at Marriott Drive
Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area and Glenwood Road south of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at the Marriott Drive access in the No Build scenario. For the 2017 Build Alternative 2 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility.

2045

Crabtree Valley Mall Driveway at Marriott Drive
Entrance Adjustment

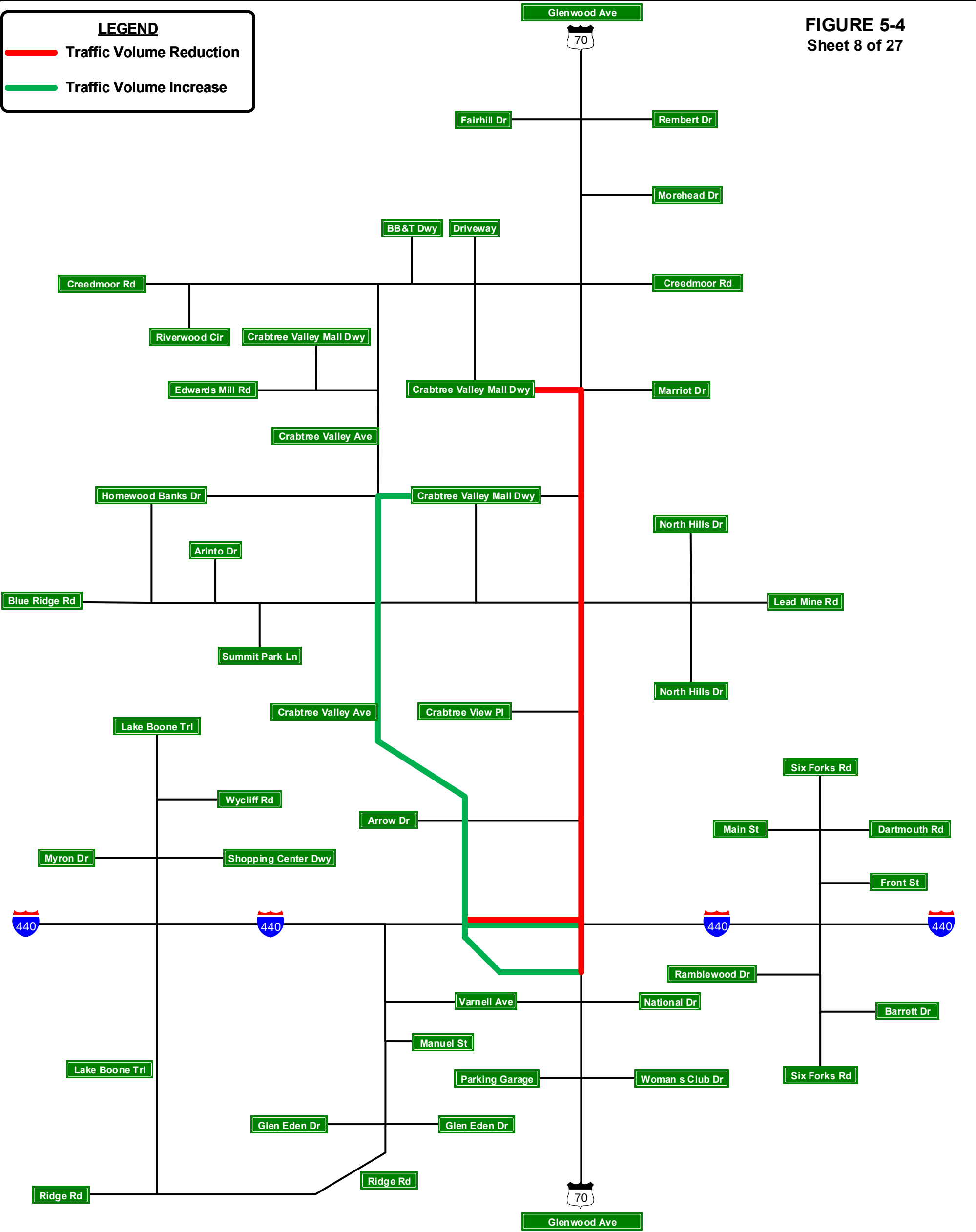
The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area and Glenwood Road south of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at the Marriott Drive access in the No Build scenario. For the 2045 Build Alternative 2 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 8 of 27



STEP 9

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Crabtree Valley Mall Driveway at Marriott Drive Exit
Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at the Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 2 scenario, 200 trips that traveled to I-440 west of the study area from the mall, 100 trips that traveled to I-440 east of the study area, and 100 trips that traveled to Glenwood Avenue south of the forecast area were relocated to the new facility.

2045

Crabtree Valley Mall Driveway at Marriott Drive Exit
Adjustment

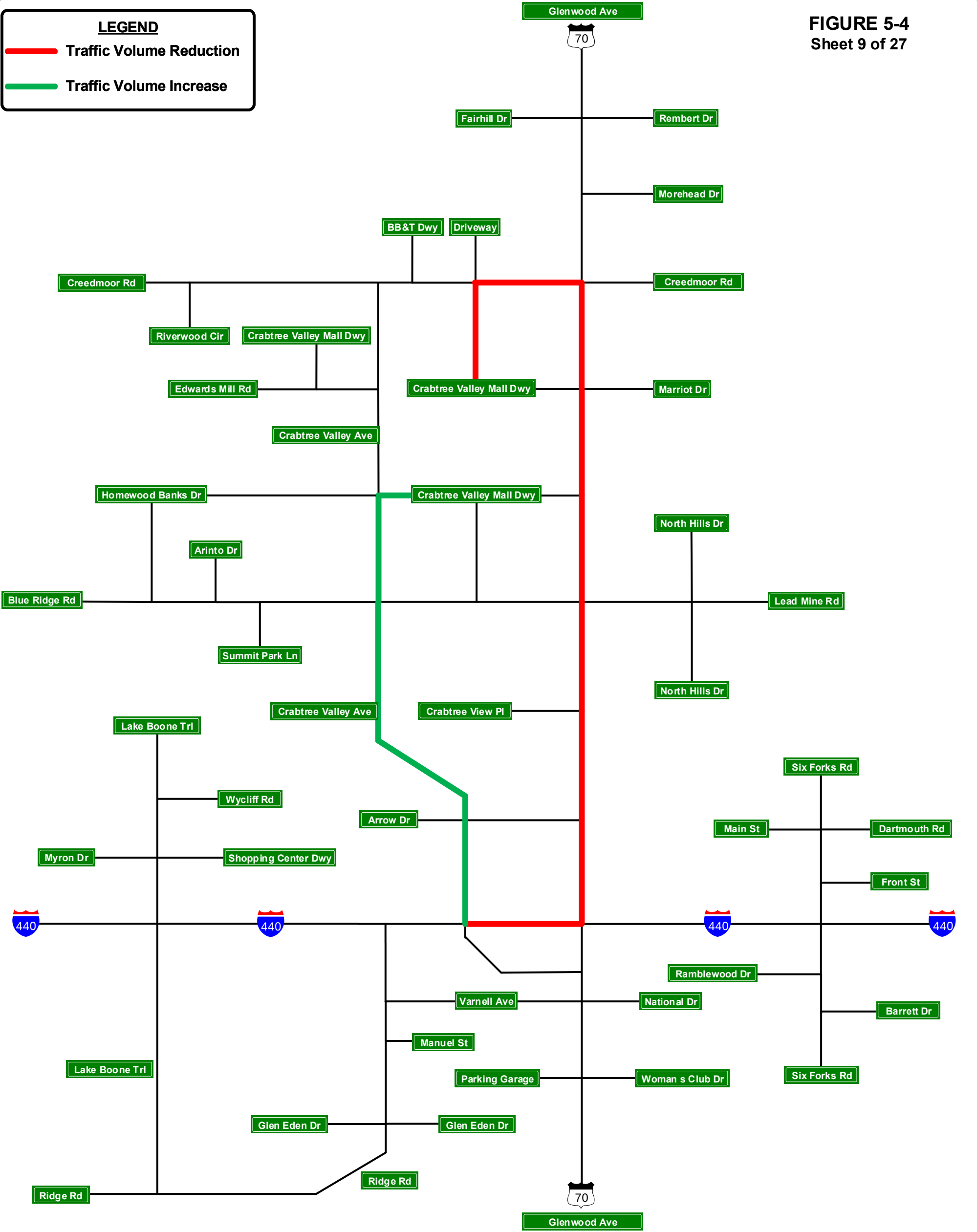
The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at the Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 2 scenario, 200 trips that traveled to I-440 west of the study area from the mall, 200 trips that traveled to I-440 east of the study area, and 100 trips that traveled to Glenwood Avenue south of the forecast area were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 9 of 27



STEP 10

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility.

2045

Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

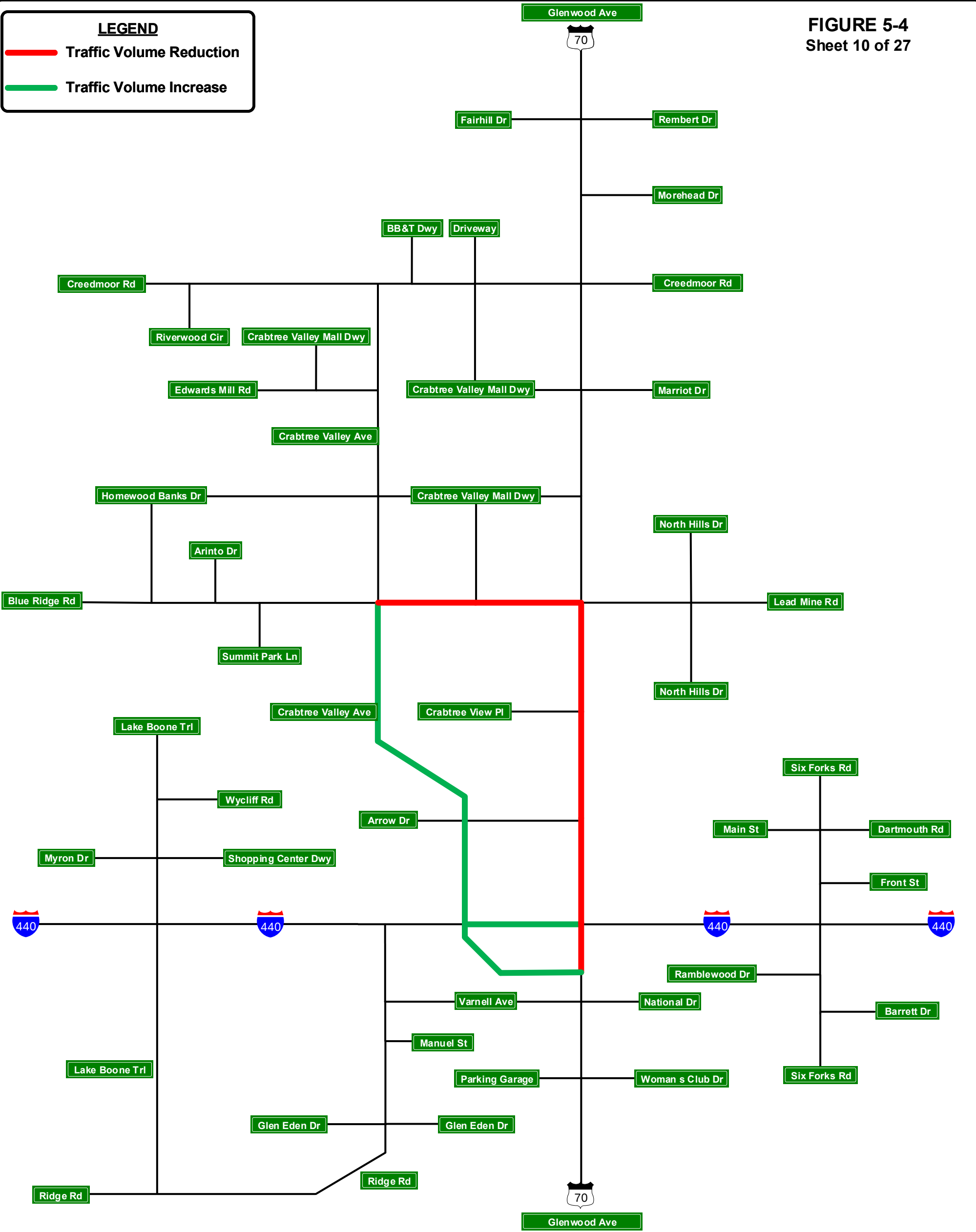
The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2045 Build Alternative 2 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 10 of 27



STEP 11

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Southern Crabtree Valley Avenue Access
Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area and Glenwood Avenue south of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2017 Build Alternative 2 scenario, 200 trips that traveled from I-440 east of the study area to access the mall and 200 trips from Glenwood Avenue south of the forecast area at this location were relocated to the new facility.

2045

Southern Crabtree Valley Avenue Access
Adjustment

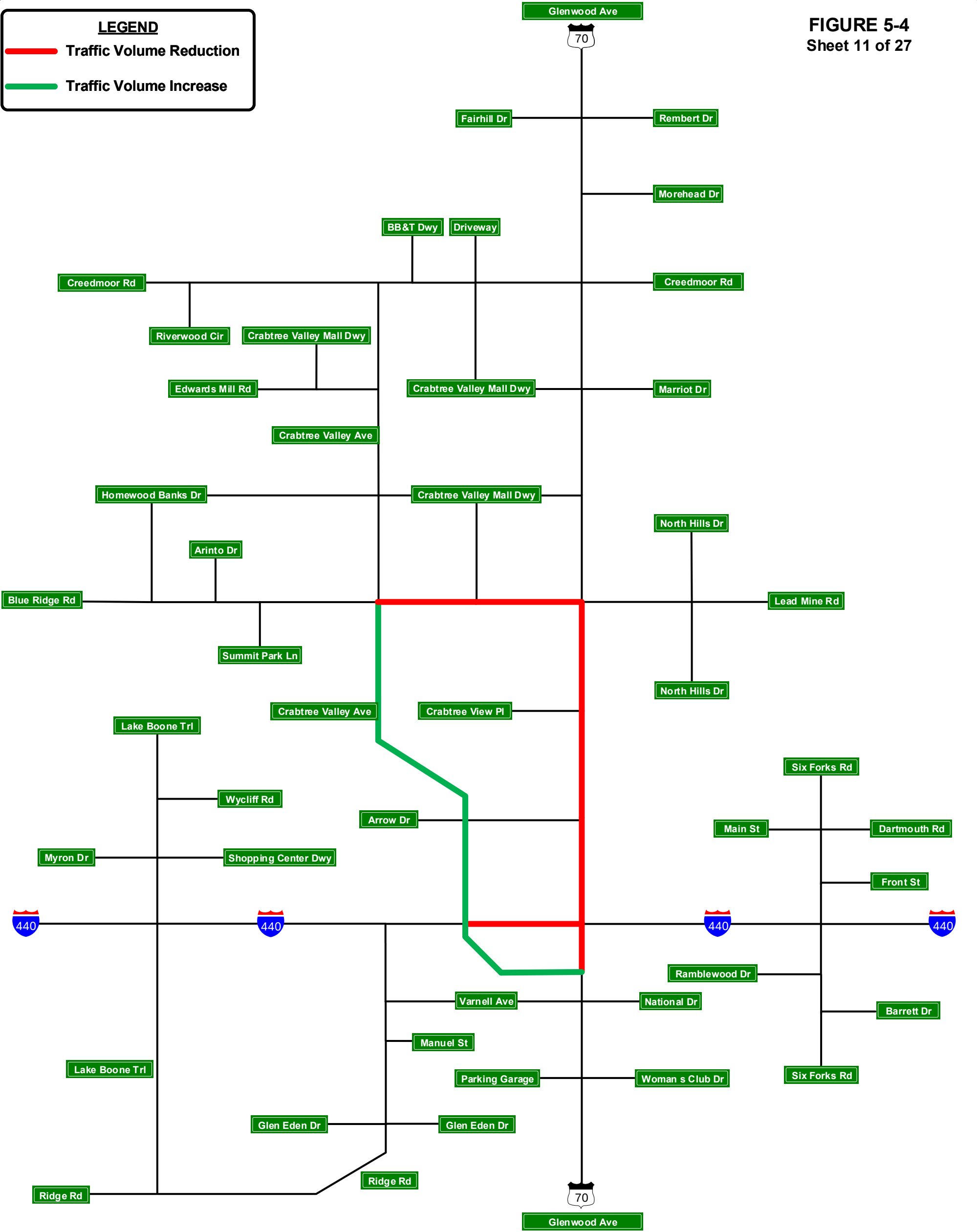
The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area and Glenwood Avenue south of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2045 Build Alternative 2 scenario, 300 trips that traveled from I-440 east of the study area to access the mall and 300 trips from Glenwood Avenue south of the forecast area at this location were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 11 of 27



STEP 12

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Northern Crabtree Valley Avenue Access Exit
Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 east of the forecast area and Glenwood Road south of the forecast area that used Blue Ridge Road and Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips from each path were relocated to the new facility.

2045

Northern Crabtree Valley Avenue Access Exit
Adjustment

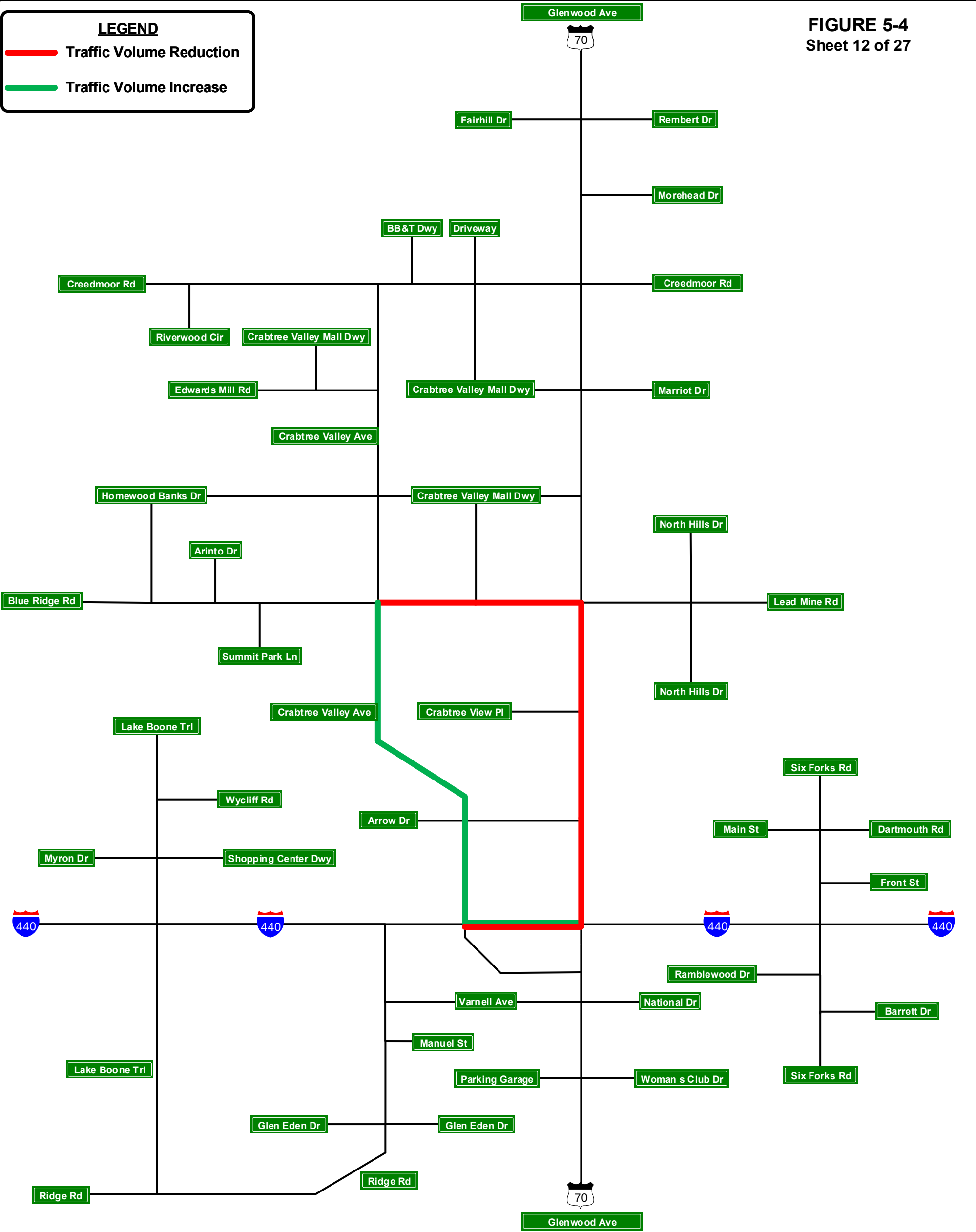
The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 east of the forecast area and Glenwood Road south of the forecast area that used Blue Ridge Road and Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 2 scenario, 200 trips from each path were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 12 of 27



STEP 13

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Northern Crabtree Valley Avenue Access Exit
Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440.

2045

Northern Crabtree Valley Avenue Access Exit
Adjustment

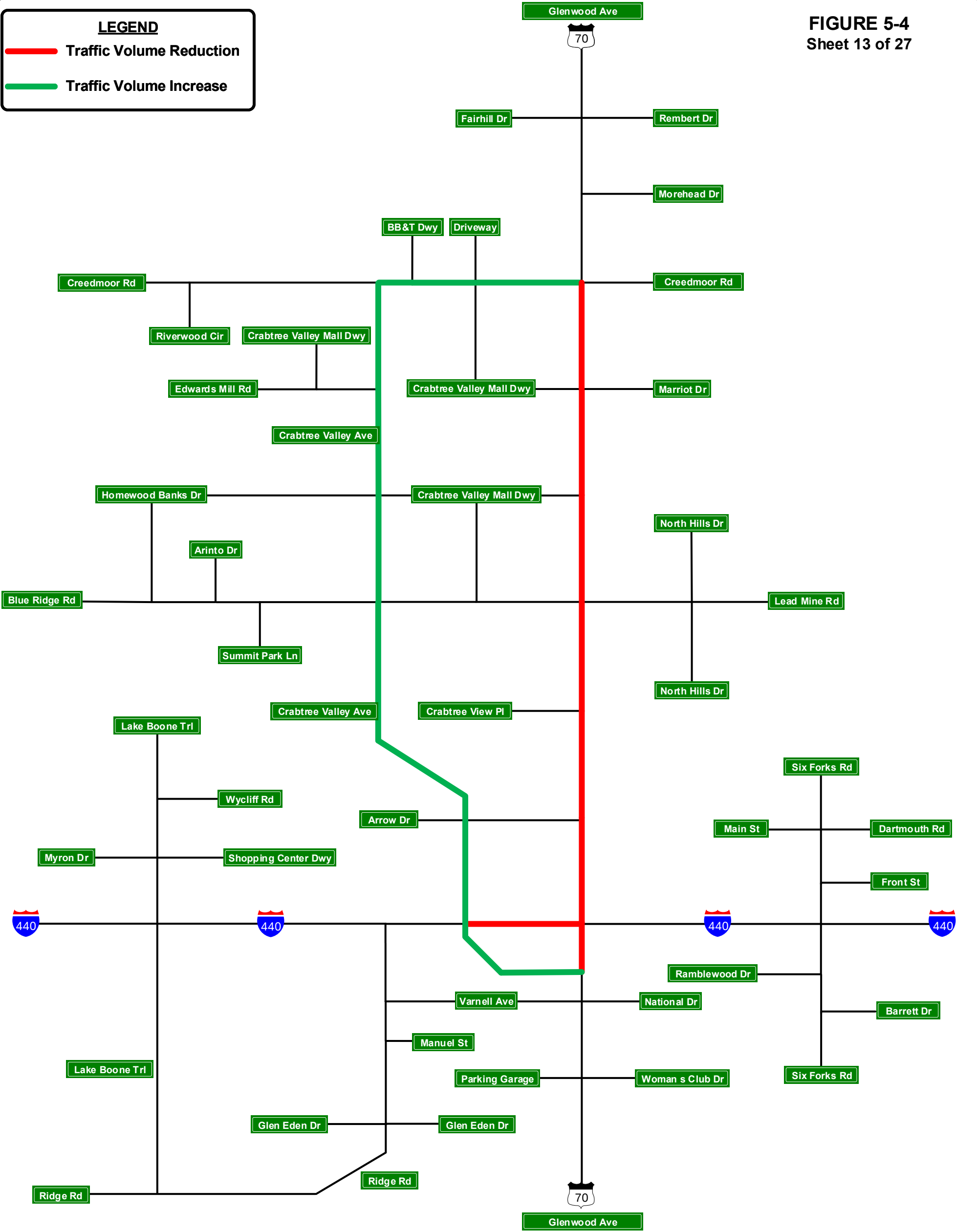
The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 13 of 27



STEP 14

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Creedmoor to I-440 Westbound Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,400 trips that accessed I-440 westbound from Creedmoor Road east of the forecast area using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor Road then travel to I-440 westbound at the interchange of the new facility and I-440. Also, 200 trips that turned left onto Glenwood Avenue from Creedmoor Road to head south through the forecast area in the No Build scenario were rerouted to the new facility.

2045

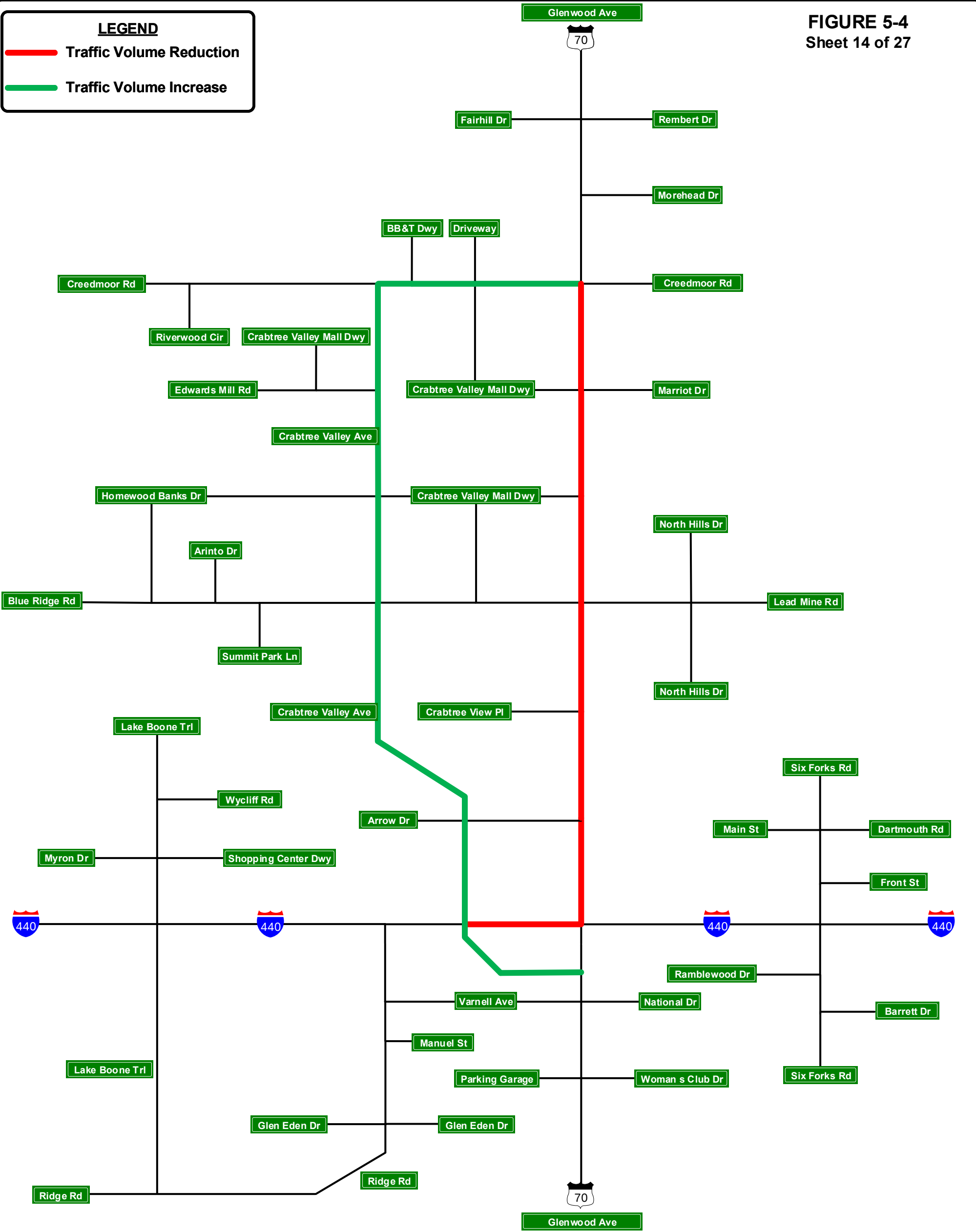
Creedmoor to I-440 Westbound Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,700 trips that accessed I-440 westbound from Creedmoor Road east of the forecast area using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor Road then travel to I-440 westbound at the interchange of the new facility and I-440. Also, 300 trips that turned left onto Glenwood Avenue from Creedmoor Road to head south through the forecast area in the No Build scenario were rerouted to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 14 of 27



STEP 15

BUILD SCENARIO
ALTERNATIVE 2

TIP: I-5870

WBS: 46307.1.1

COUNTY: Wake

DIVISION: 5

PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Creedmoor from I-440 Eastbound Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,400 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound. Also, 200 trips that originated on Glenwood Road south of the forecast area that travelled north along Glenwood Avenue to turn right onto Creedmoor Road in the No Build Scenario were rerouted to the new facility.

2045

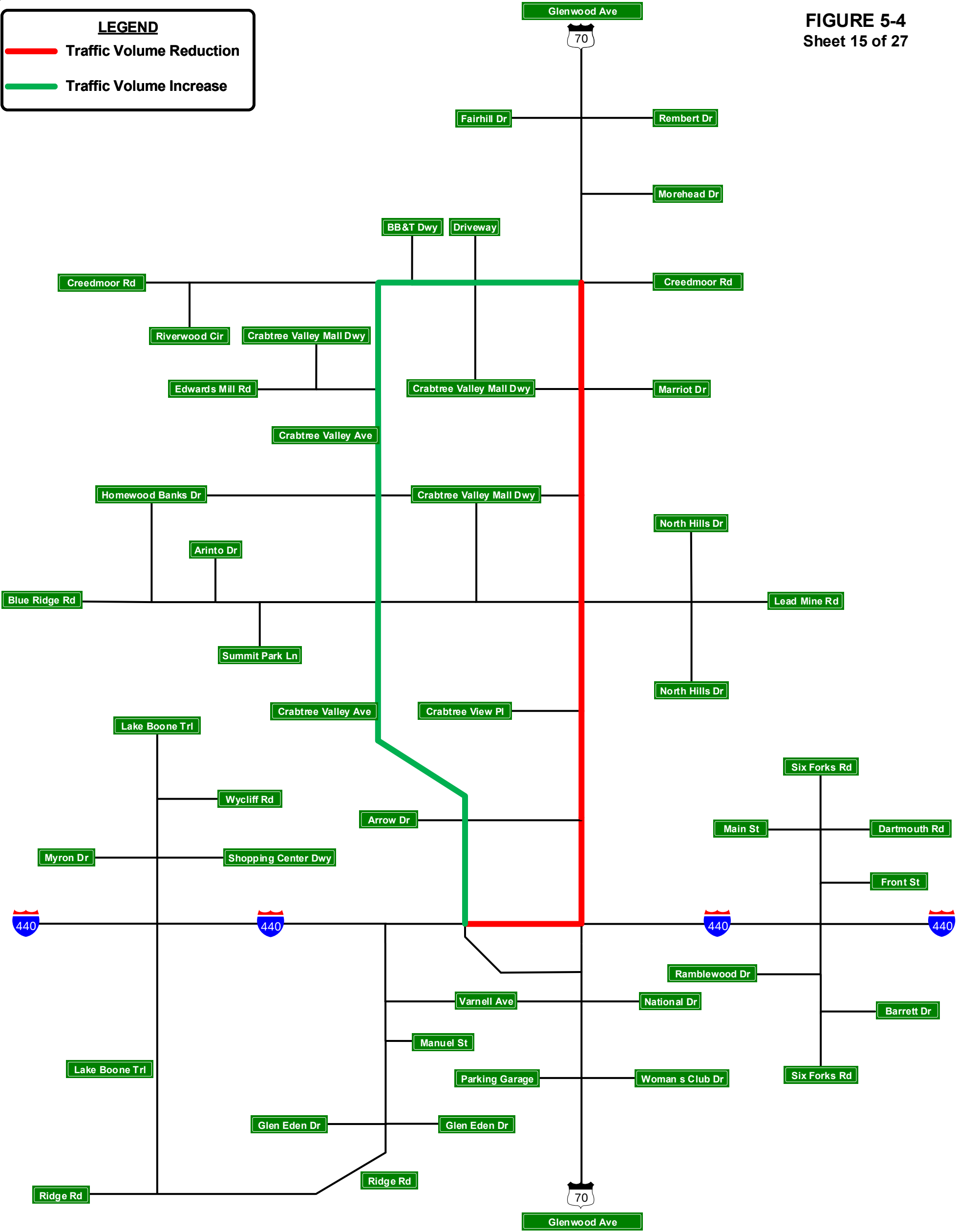
Creedmoor from I-440 Eastbound Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,700 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound. Also, 300 trips that originated on Glenwood Road south of the forecast area that travelled north along Glenwood Avenue to turn right onto Creedmoor Road in the No Build Scenario were rerouted to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 15 of 27



STEP 16

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Glenwood Road to and from I-440 West Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,000 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

2045

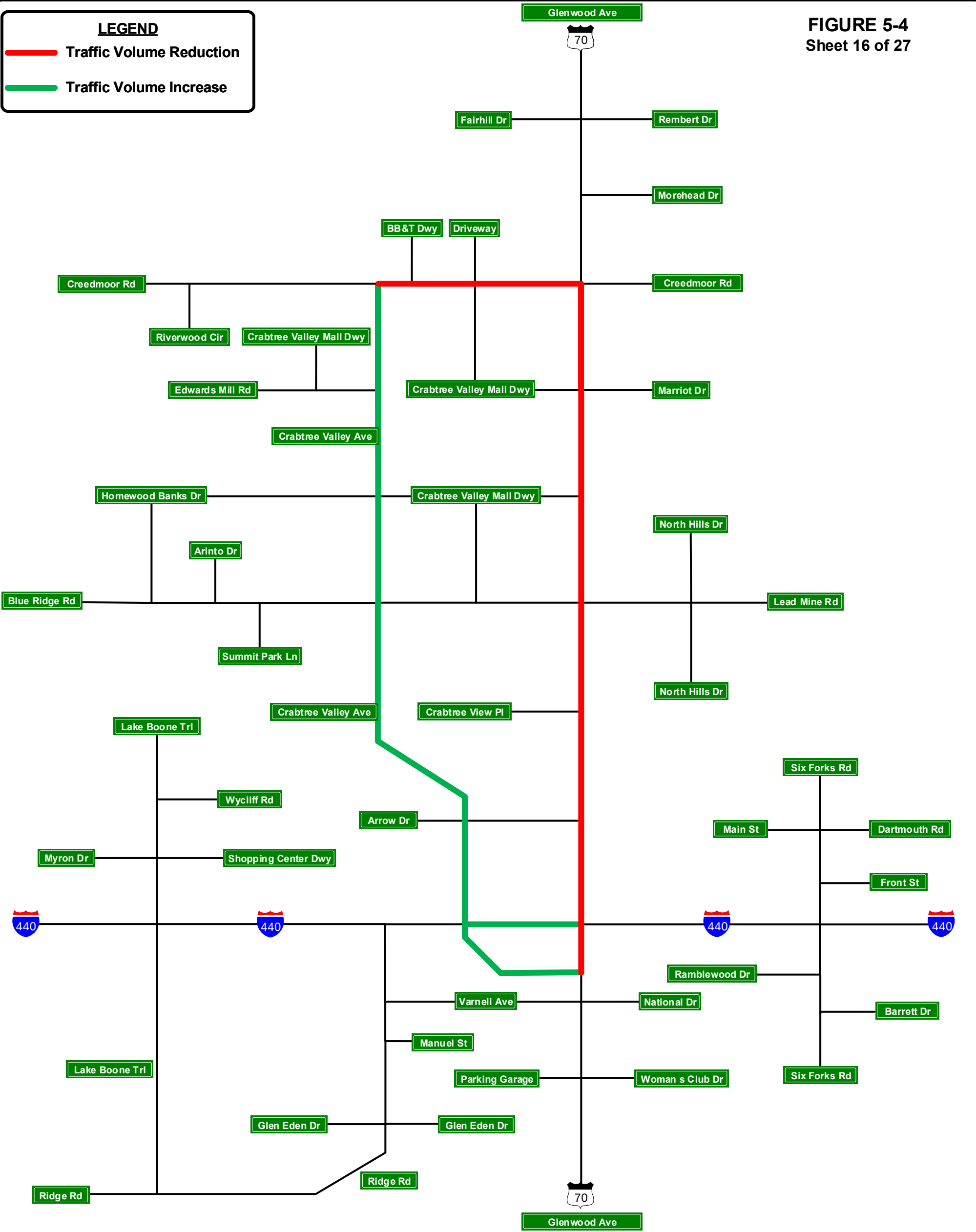
Glenwood Road to and from I-440 West Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,200 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,200 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 16 of 27



STEP 17

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Creedmoor Road (West of Forecast Area) to and from I-440 East and Glenwood Avenue (South) Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 400 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 400 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road. Also, 100 trips that were destined for Glenwood Avenue south of the forecast area that turned right from eastbound Creedmoor Road onto Glenwood Avenue in the No Build scenario will now use the new facility. Similarly, 100 trips that were destined for Creedmoor Road west of the forecast area that originated from Glenwood Avenue south of the forecast area that used Glenwood Avenue in the No Build scenario will now use the new facility.

2045

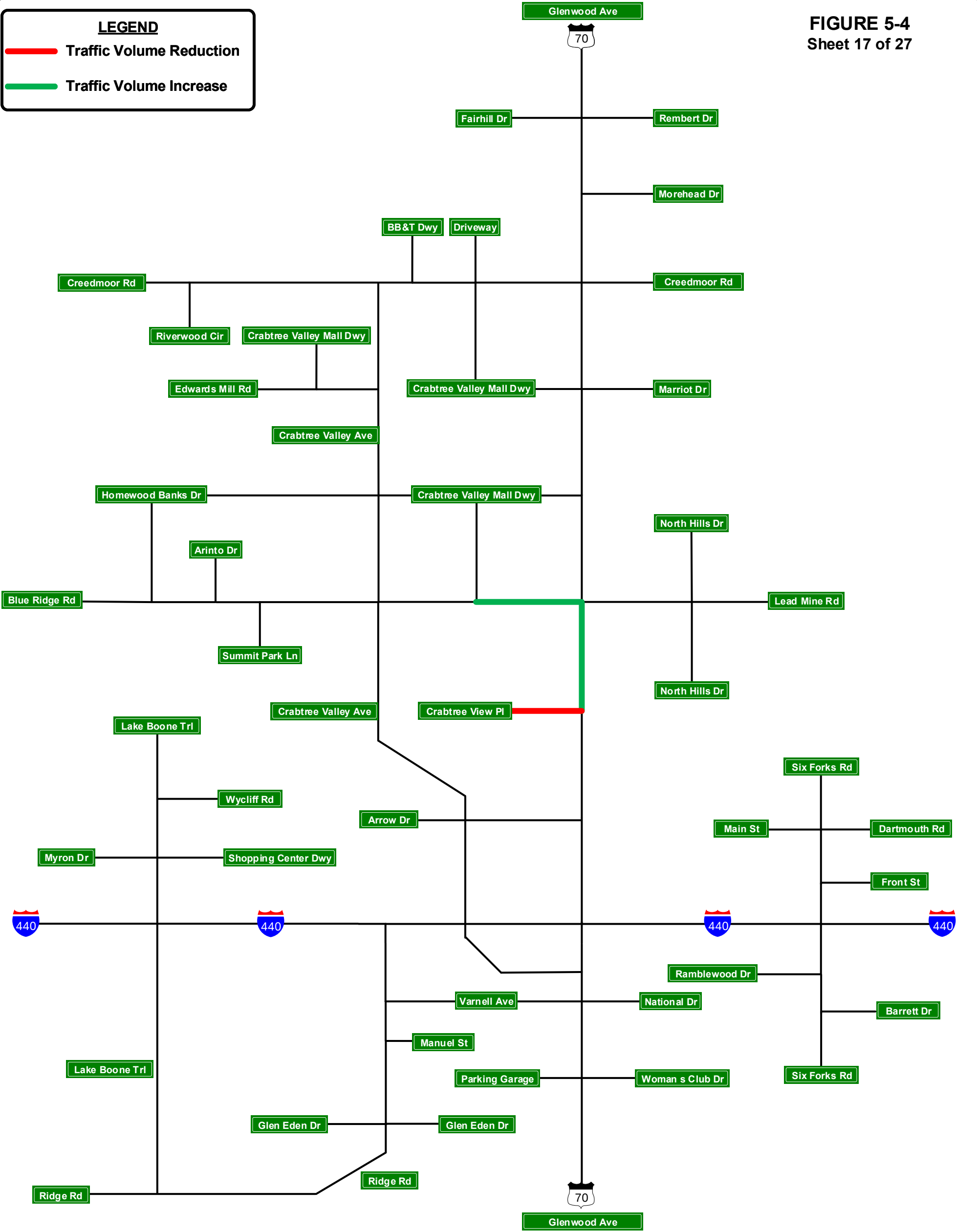
Creedmoor Road (West of Forecast Area) to and from I-440 East and Glenwood Avenue (South) Adjustment
Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 500 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 500 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valle Avenue onto Creedmoor Road. Also, 100 trips that were destined for Glenwood Avenue south of the forecast area that turned right from eastbound Creedmoor Road onto Glenwood Avenue in the No Build scenario will now use the new facility. Similarly, 100 trips that were destined for Creedmoor Road west of the forecast area that originated from Glenwood Avenue south of the forecast area that used Glenwood Avenue in the No Build scenario will now use the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 17 of 27



STEP 18

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Crabtree View Place Adjustment
Based on the Build Alternative 2 design, all trips that utilize Crabtree View Place in the No Build scenario were relocated to the intersection of Blue Ridge Road and Glenwood Avenue.

2045

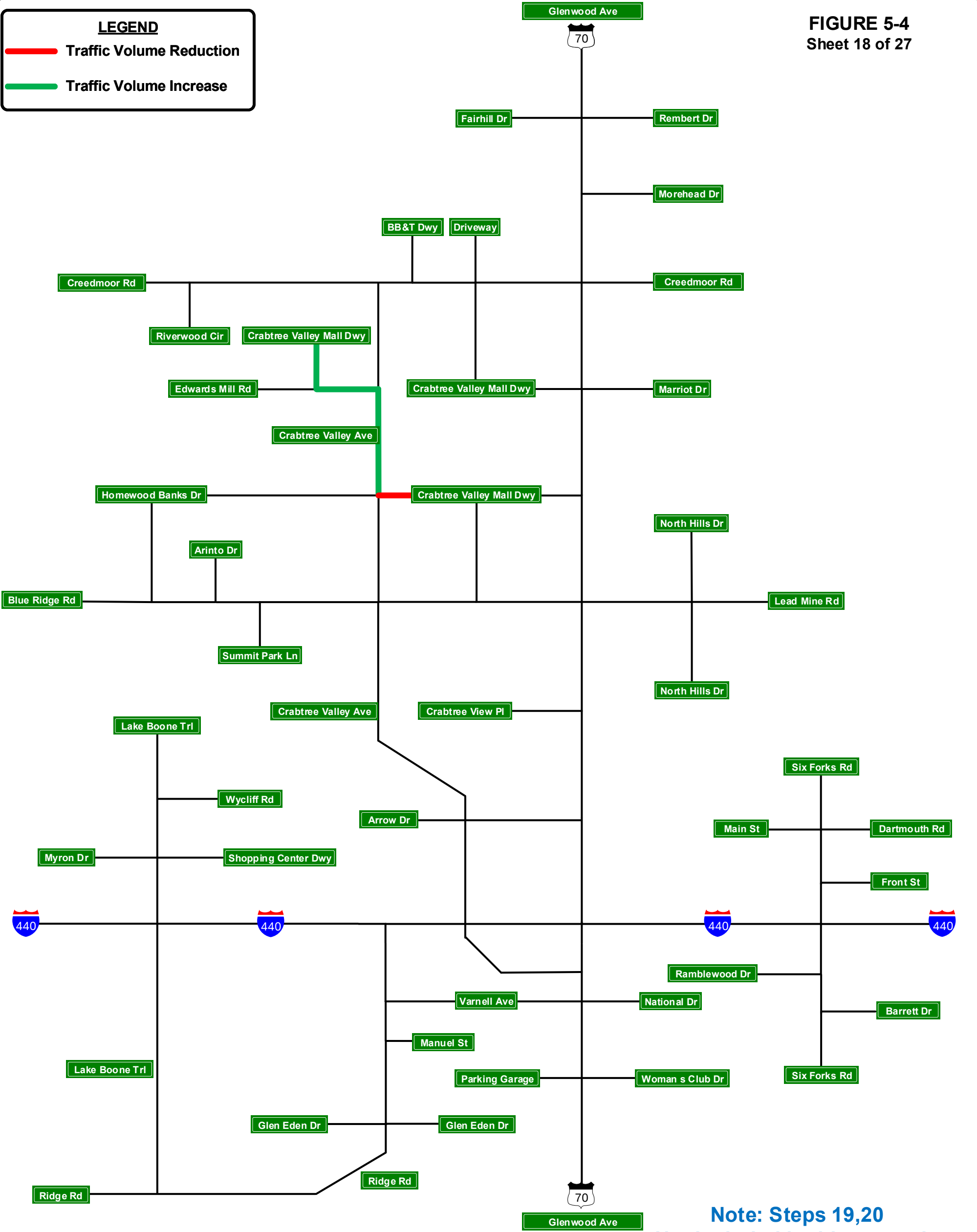
Crabtree View Place Adjustment
Based on the Build Alternative 2 design, all trips that utilize Crabtree View Place in the No Build scenario were relocated to the intersection of Blue Ridge Road and Glenwood Avenue.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 18 of 27



Note: Steps 19,20
Not included in this scenario

STEP 21

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Adjust Trip Dispersion Along Crabtree Valley Avenue
During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing at the northern Crabtree Valley Avenue access, 600 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access, and 600 westbound left turns exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

2045

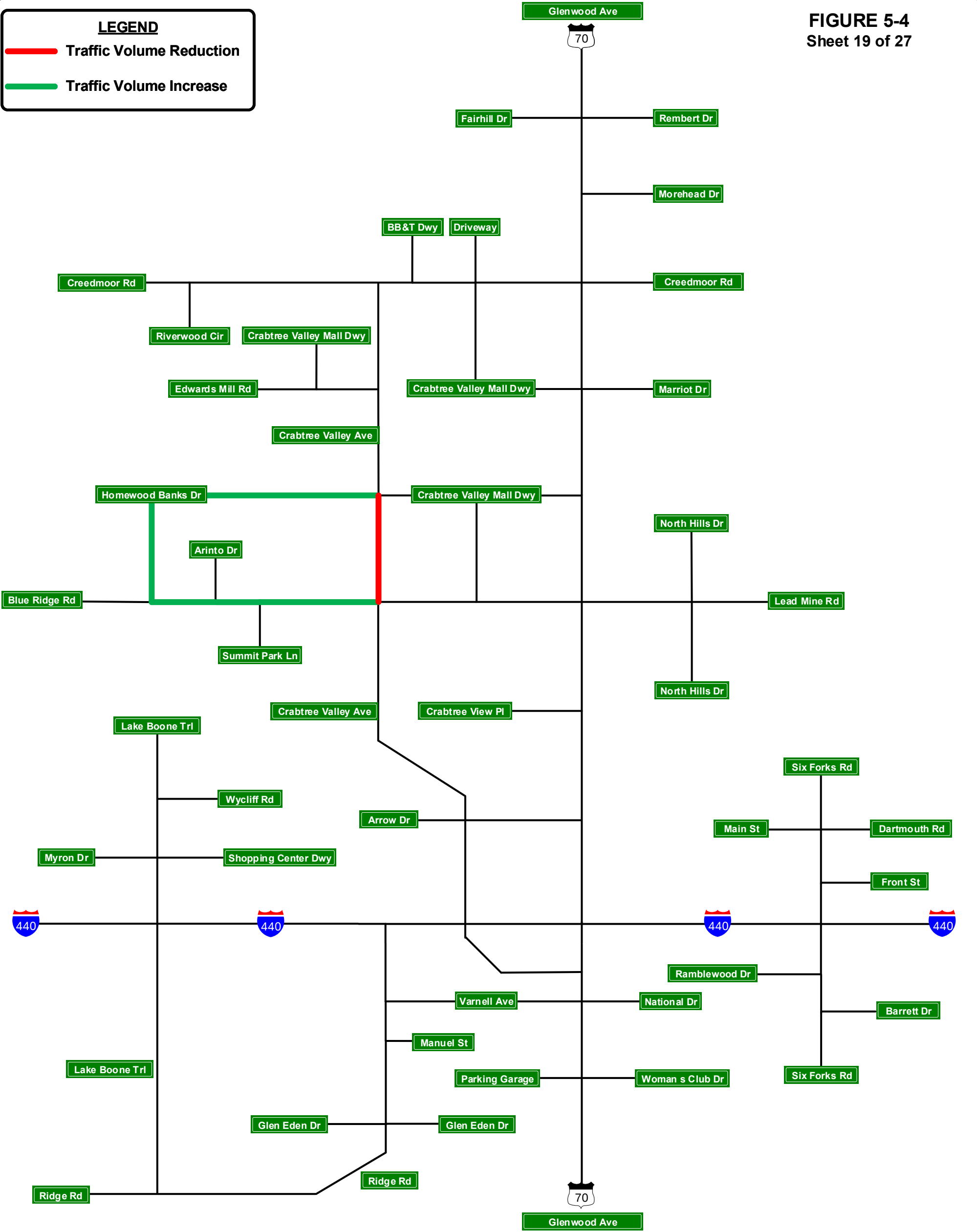
Adjust Trip Dispersion Along Crabtree Valley Avenue
During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing at the northern Crabtree Valley Avenue access, 700 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access, and 700 westbound left turns exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 19 of 27



STEP 22

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Adjust for Alternative 2 Design at Blue Ridge Road (NE Quad)

The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northeast quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

2045

Adjust for Alternative 2 Design at Blue Ridge Road (NE Quad)

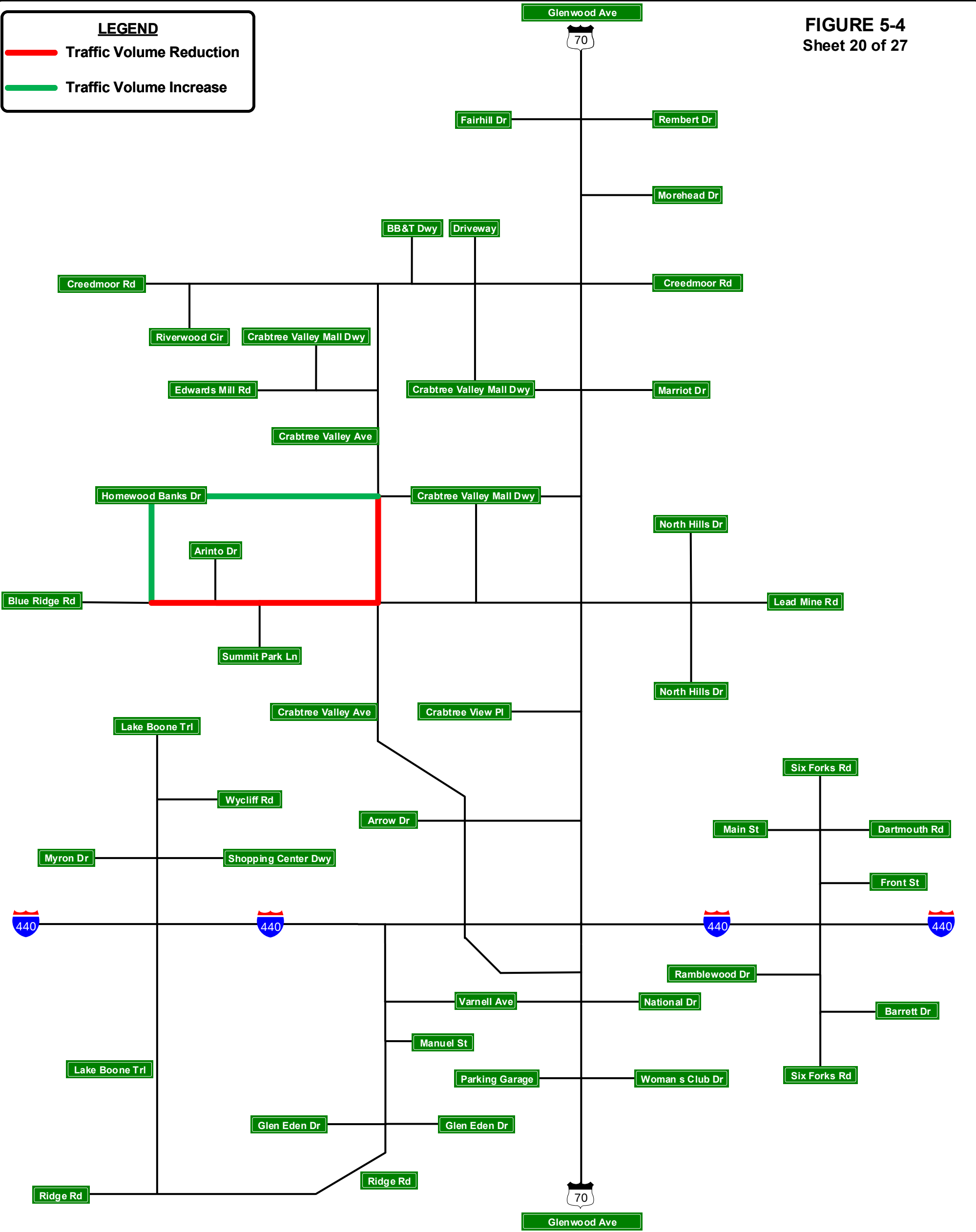
The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northeast quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 20 of 27



STEP 23

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Adjust for Alternative 2 Design at Blue Ridge Road (NW Quad)
The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northwest quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

2045

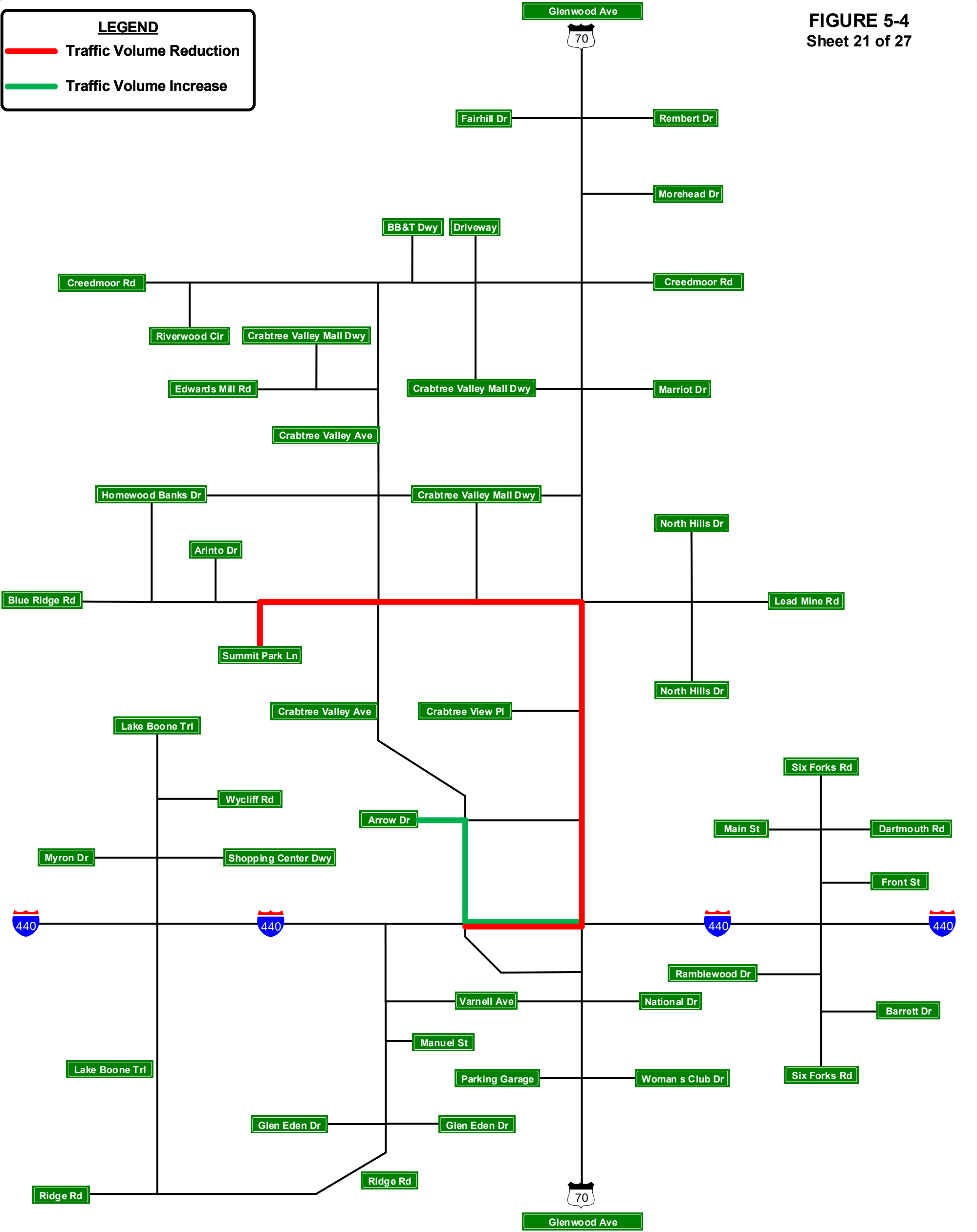
Adjust for Alternative 2 Design at Blue Ridge Road (NW/SW Quad)
The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northwest quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive. Also, the movements in the southwest quadrant were relocated in the same manner.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 21 of 27



STEP 24

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Arrow Drive (West) Adjustment
To account for new connectivity provided by Alternative 2, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 eastbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility. Also, 200 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 westbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility.

2045

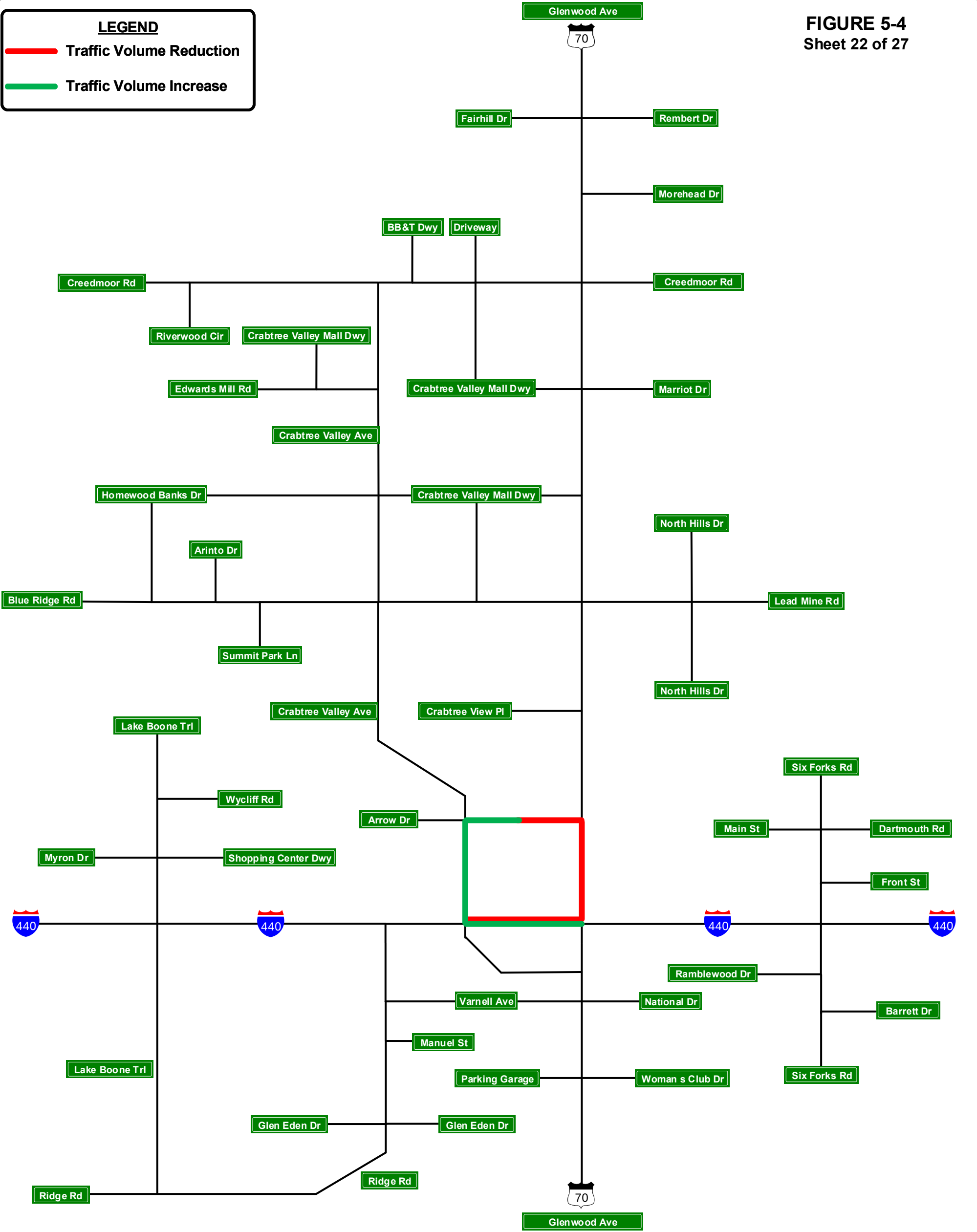
Arrow Drive (West) Adjustment
To account for new connectivity provided by Alternative 2, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 eastbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility. Also, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 westbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 22 of 27



STEP 25

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Arrow Drive (East) Adjustment

To account for new connectivity provided by Alternative 2, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 eastbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 westbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. Further, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 westbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 eastbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange.

2045

Arrow Drive (East) Adjustment

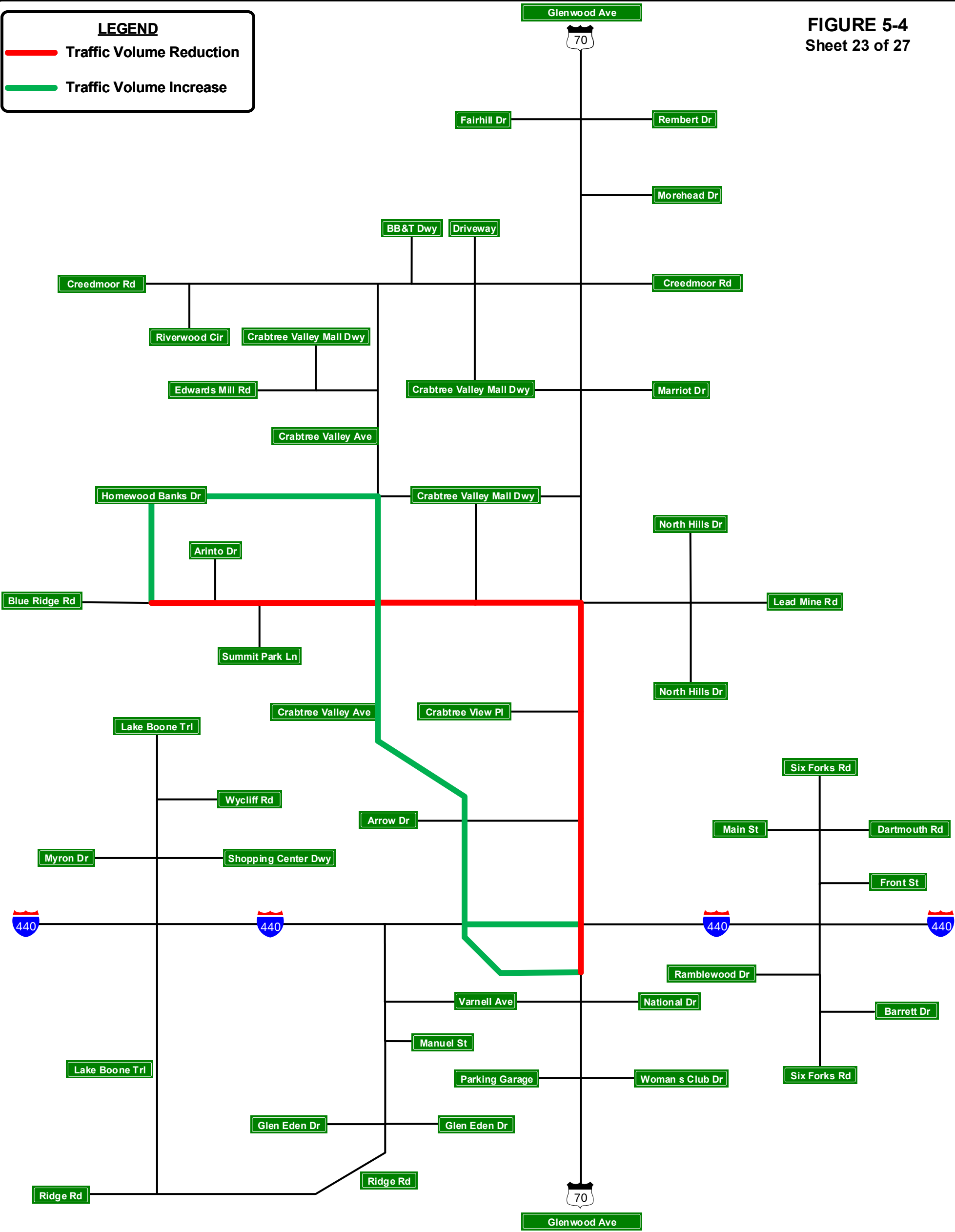
To account for new connectivity provided by Alternative 2, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 eastbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 westbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. Further, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 westbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 eastbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 23 of 27



STEP 26

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Blue Ridge Road Adjustment
After review of the forecast, it was determined that 300 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road. Also, 200 trips that traveled from Glenwood Avenue south of the forecast area that tuned left from Glenwood Avenue to head west on Blue Ridge Road in the No Build scenario were relocated to the new facility. Similarly, 200 trips that traveled from Blue Ridge Road west of the forecast area that tuned right onto Glenwood Avenue in the No Build scenario were relocated to the new facility.

2045

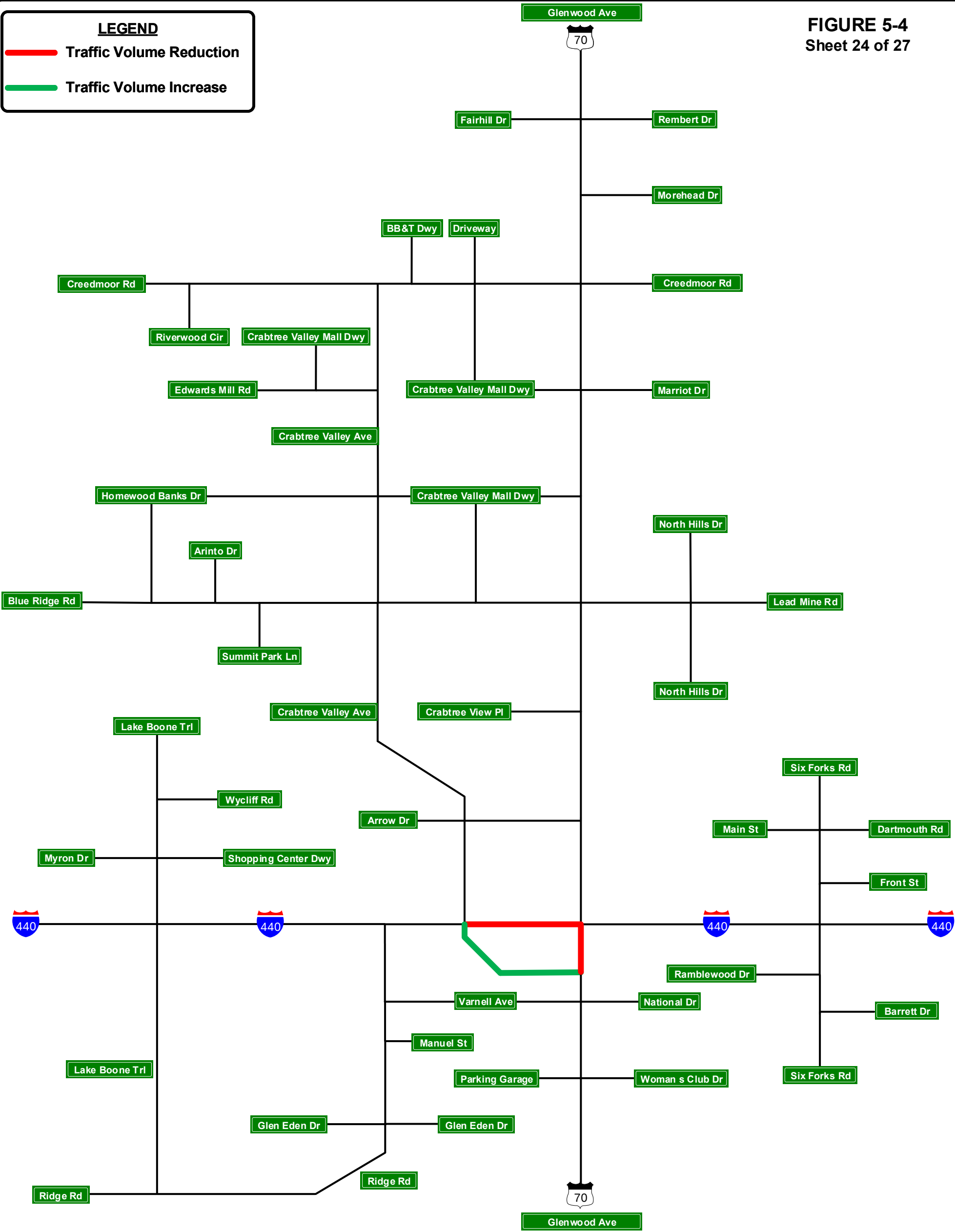
Blue Ridge Road Adjustment
After review of the forecast, it was determined that 400 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road. Also, 300 trips that traveled from Glenwood Avenue south of the forecast area that tuned left from Glenwood Avenue to head west on Blue Ridge Road in the No Build scenario were relocated to the new facility. Similarly, 300 trips that traveled from Blue Ridge Road west of the forecast area that tuned right onto Glenwood Avenue in the No Build scenario were relocated to the new facility.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 24 of 27



STEP 27

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Glenwood Avenue (South) to I-440 Adjustment
In this step, 500 trips that originated on Glenwood Road south of the forecast area that accessed I-440 westbound by way of the Glenwood Avenue interchange with I-440 in the No Build Scenario are relocated to the new interchange. Also, 100 trips that travel from I-440 westbound to Glenwood Avenue by way of the Glenwood Avenue interchange with I-440 in the No Build scenario are relocated to the new interchange.

2045

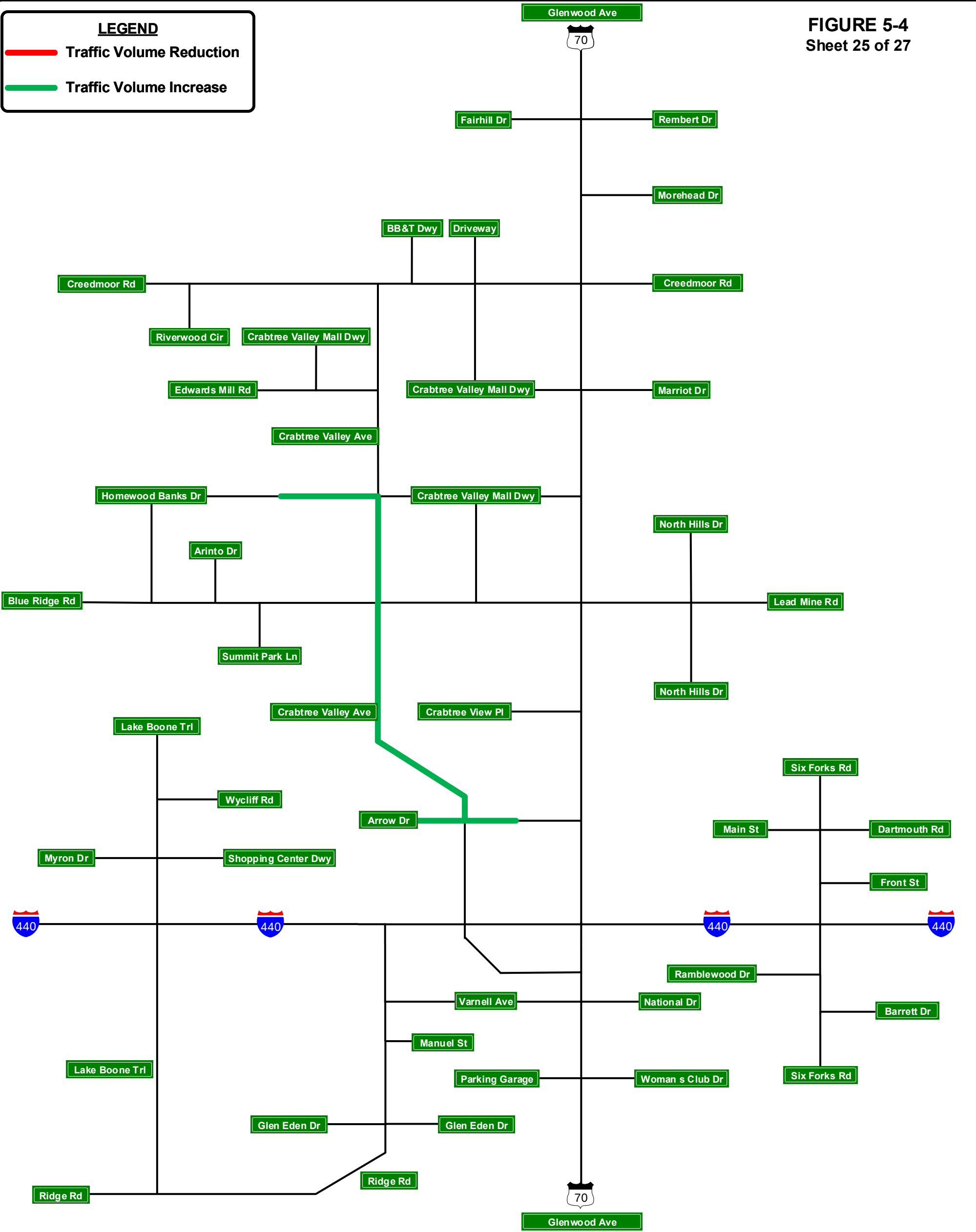
Glenwood (South) to I-440 Adjustment
In this step, 700 trips that originated on Glenwood Road south of the forecast area that accessed I-440 westbound by way of the Glenwood Avenue interchange with I-440 in the No Build Scenario are relocated to the new interchange. Also, 100 trips that travel from I-440 westbound to Glenwood Avenue by way of the Glenwood Avenue interchange with I-440 in the No Build scenario are relocated to the new interchange.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 25 of 27



STEP 28

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Arrow Drive Connection Adjustment

The connectivity provided by the Alternative 2 design brings additional trips into the Arrow Drive area. As a result, 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (east side) as well as 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (west side) were added.

2045

Arrow Drive Connection Adjustment

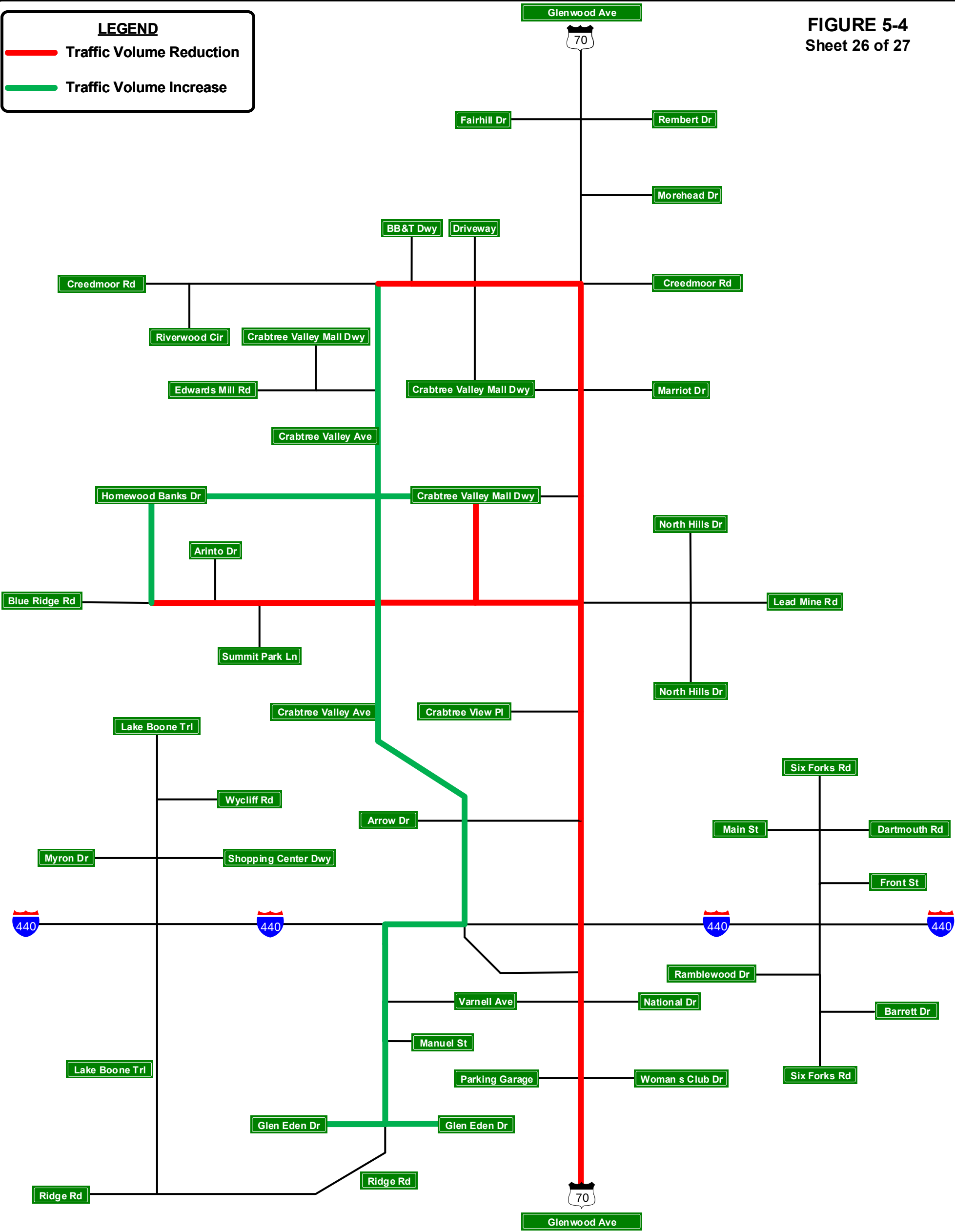
The connectivity provided by the Alternative 2 design brings additional trips into the Arrow Drive area. As a result, 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (east side) as well as 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (west side) were added.

LEGEND

Traffic Volume Reduction

Traffic Volume Increase

FIGURE 5-4
Sheet 26 of 27



STEP 29

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

2017

Ridge Road Adjustment

Due to the improved connectivity from the Ridge Road area to Crabtree View Avenue, it was assumed that some of the trips that use the Glenwood Avenue corridor to access the mall area as well as the Creedmoor Road area would utilize the new facility. As such, 1,800 trips that used the Glenwood Avenue corridor to access various locations were relocated to the new facility. Specifically, 300 trips to and 300 trips from Creedmoor Road west of the forecast area, 300 trips to and 300 trips from the southern Crabtree Valley Avenue access, and 300 trips to and 300 trips from Blue Ridge Road west of the forecast area were rerouted to the new facility.

2045

Ridge Road Adjustment

Due to the improved connectivity from the Ridge Road area to Crabtree View Avenue, it was assumed that some of the trips that use the Glenwood Avenue corridor to access the mall area as well as the Creedmoor Road area would utilize the new facility. As such, 2,400 trips that used the Glenwood Avenue corridor to access various locations were relocated to the new facility. Specifically, 400 trips to and from Creedmoor Road west of the forecast area, 400 trips to and from the southern Crabtree Valley Avenue access, and 400 trips to and from Blue Ridge Road west of the forecast area were rerouted to the new facility.

LEGEND

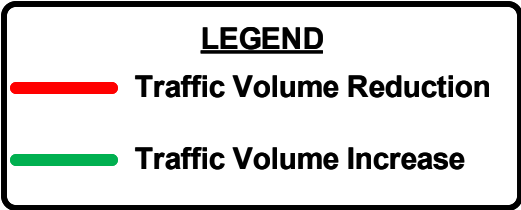
 Traffic Volume Reduction

 Traffic Volume Increase

LEGEND

 Traffic Volume Reduction

 Traffic Volume Increase



STEP 30	
BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

BUILD SCENARIO ALTERNATIVE 2	
TIP: I-5870	WBS: 46307.1.1
COUNTY: Wake	DIVISION: 5
PREPARED BY: Patriot Transportation Engineering, PLLC	
PROJECT: I-440 at Ridge Road/ Crabtree Valley Avenue Interchange	

TIP: I-5870 **WBS:** 46307.1.1

TIP: I-5870 **WBS:** 46307.1.1

COUNTY: Wake	DIVISION: 5
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COUNTY: Wake	DIVISION: 5
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PREPARED BY: Patriot
Transportation Engineering, PLLC

PROJECT: I-440 at Ridge Road/
Crabtree Valley Avenue Interchange

2017

Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

2045

Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

For this step, 600 trips from eastbound I-440, 1,000 trips from westbound I-440, and 1,000 trips from Glenwood Avenue south of I-440, that entered the mall at the Blue Ridge Driveway were relocated to the new facility and now enter the mall at the southern Crabtree Valley Avenue access. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 6 – Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. In this step, 500 trips were relocated from the Crabtree Valley Mall Driveway intersection with Glenwood Avenue to the southern Crabtree Valley Avenue mall access. Of those, 400 utilized the new facility to access I-440 westbound while 100 travelled to I-440 eastbound. Also, 200 of the trips exiting the mall at the Crabtree Valley Mall Driveway intersection with Glenwood Avenue in the No Build scenario were assumed to be destined for Lead Mine Road. Due to the new configuration, those trips were rerouted to the Blue Ridge Road mall driveway, and now travel to Lead Mine Road from Blue Ridge Road. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 7 – Not used in this scenario

Step 8 – Crabtree Valley Mall Driveway at Marriott Drive Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area and Glenwood Road south of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at the Marriott Drive access in the No Build scenario. For the 2017 Build Alternative 2 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 9 – Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at the Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 2 scenario, 200 trips that traveled to I-440 west of the study area from the mall, 100 trips that traveled to I-440 east of the study area, and 100 trips that traveled to Glenwood Avenue south of the forecast area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 10 – Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 11 – Southern Crabtree Valley Avenue Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area and Glenwood Avenue south of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2017 Build Alternative 2 scenario, 200 trips that traveled from I-440 east of the study area to access the mall and 200 trips from Glenwood Avenue south of the forecast area at this location were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 12 – Northern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 east of the forecast area and Glenwood Road south of the forecast area that used Blue Ridge Road and Glenwood Avenue in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips from each path were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 13 – Northern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 14 – Creedmoor to I-440 Westbound Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,400 trips that accessed I-440 westbound from Creedmoor Road east of the forecast area using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor Road then travel to I-440 westbound at the interchange of the new facility and I-440. Also, 200 trips that turned left onto Glenwood Avenue from Creedmoor Road to head south through the forecast area in the No Build scenario were rerouted to the new facility.

Step 15 – Creedmoor from I-440 Eastbound Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,400 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound. Also, 200 trips that originated on Glenwood Road south of the forecast area that travelled north along Glenwood Avenue to turn right onto Creedmoor Road in the No Build Scenario were rerouted to the new facility.

Step 16 – Glenwood Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,000 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

Step 17 – Creedmoor Road (West of Forecast Area) to and from I-440 East and Glenwood Avenue (South) Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 400 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 400 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valley Avenue onto Creedmoor Road. Also, 100 trips that were destined for Glenwood Avenue south of the forecast area that turned right from eastbound Creedmoor Road onto Glenwood Avenue in the No Build scenario will now use the new facility. Similarly, 100 trips that were destined for Creedmoor Road west of the forecast area that originated from Glenwood Avenue south of the forecast area that used Glenwood Avenue in the No Build scenario will now use the new facility.

Step 18 – Crabtree View Place Adjustment

Based on the Build Alternative 2 design, all trips that utilize Crabtree View Place in the No Build scenario were relocated to the intersection of Blue Ridge Road and Glenwood Avenue.

Step 19 – This step is not included in this scenario

Step 20 – This step is not included in this scenario

Step 21 – Adjust Trip Dispersion Along Crabtree Valley Avenue

During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing at the northern Crabtree Valley Avenue access, 600 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access, and 600 westbound left turns exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

Step 22 – Adjust for Alternative 2 Design at Blue Ridge Road (NE Quad)

The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northeast quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

Step 23 – Adjust for Alternative 2 Design at Blue Ridge Road (NW Quad)

The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northwest quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

Step 24 – Arrow Drive (West) Adjustment

To account for new connectivity provided by Alternative 2, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 eastbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility. Also, 200 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 westbound in the No Build scenario were rerouted to the new facility by way of the new

intersection of Arrow Drive and the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 25 – Arrow Drive (East) Adjustment

To account for new connectivity provided by Alternative 2, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 eastbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 westbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. Further, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 westbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 eastbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. The number of trips assumed was based on the judgement of the forecasters.

Step 26 – Blue Ridge Road Adjustment

After review of the forecast, it was determined that 300 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road. Also, 200 trips that traveled from Glenwood Avenue south of the forecast area that turned left from Glenwood Avenue to head west on Blue Ridge Road in the No Build scenario were relocated to the new facility. Similarly, 200 trips that traveled from Blue Ridge Road west of the forecast area that turned right onto Glenwood Avenue in the No Build scenario were relocated to the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 27 – Glenwood Avenue (South) to I-440 Adjustment

In this step, 500 trips that originated on Glenwood Road south of the forecast area that accessed I-440 westbound by way of the Glenwood Avenue interchange with I-440 in the No Build Scenario are relocated to the new interchange. Also, 100 trips that travel from I-440 westbound to Glenwood Avenue by way of the Glenwood Avenue interchange with I-440 in the No Build scenario are relocated to the new interchange. The number of trips assumed was based on the judgement of the forecasters.

Step 28 – Arrow Drive Connection Adjustment

The connectivity provided by the Alternative 2 design brings additional trips into the Arrow Drive area. As a result, 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (east side) as well as 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (west side) were added. The number of trips assumed was based on the judgement of the forecasters.

Step 29 – Ridge Road Adjustment

Due to the improved connectivity from the Ridge Road area to Crabtree View Avenue, it was assumed that some of the trips that use the Glenwood Avenue corridor to access the mall area as well as the Creedmoor Road area would utilize the new facility. As such, 1,800 trips that used the Glenwood Avenue corridor to access various locations were relocated to the new facility. Specifically, 300 trips to and 300 trips from Creedmoor Road west of the forecast area, 300 trips to and 300 trips from the southern Crabtree Valley Avenue access, and 300 trips to and 300 trips from Blue Ridge Road west of the forecast area were rerouted to the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 30 – Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

6. FUTURE YEAR 2045 NO-BUILD TRAFFIC FORECAST

6.1 ASSUMPTIONS

A Future Year of 2045 was chosen for the I-5870 traffic volume examination as it is the latest year available in the Triangle Regional Travel Demand Model and to correspond with the horizon year of the MTP. All 2045 fiscally-constrained projects, with the exception of I-5870, listed in the *Connect 2045 – The Metropolitan Transportation Plan* (2045 MTP) were included in the 2045 No-Build alternative model run.

The modeling aspects for the 2045 No-Build scenario include utilizing the Triangle Regional Travel Demand Model fiscally constrained model. The first step was to review the model and determine if the changes included in the fiscally constrained MTP have been properly included in the model. Based on this review, the following two changes were made to the model and are the same changes that were made to the 2013 base year model:

- The speed limit on Crabtree Valley Avenue was 25 mph in the model. The speed limit was updated to match the 35 mph speed limit in place at this time.
- The TAZ that includes Crabtree Valley Mall includes three centroid connectors that connect to 1) US 70; 2) Blue Ridge Road and 3) Creedmoor Road. Crabtree Valley Mall has seven access points with two off of Crabtree Valley Avenue; therefore, a fourth centroid connector was added that connects to Crabtree Valley Avenue.

6.2 METHODOLOGY

The Triangle Regional Travel Demand Model was utilized as a tool in the development of the 2045 Future Year No-Build traffic volumes.

2045 Future Year No-Build model runs were completed without the proposed project in place. The Compound Annual Growth Rate (CAGR) for each traffic volume location was calculated using the following equation:

$$((2045 \text{ Model Value} / 2013 \text{ Model Value})^{1/32}) - 1$$

Additionally, the raw model volumes were compared to determine the total change in model volume between 2013 and 2045. The CAGR rates and total volume changes were reviewed and adjusted during this phase using engineering judgment where needed. The selected CAGR rates were then determined and applied to the 2017 No-Build traffic volumes and extrapolated to determine the 2045 traffic volumes.

6.3 DESIGN FACTORS

The 2045 model network was reviewed to see if any of the corridors experienced changes in the percent of traffic occurring in the peak hour, direction of peak travel, or directional split. Based on a review of the model data it was determined that all the 2017 Base Year factors were still adequate and that none of the design factors would change from those included in the 2017 Base Year forecast.

6.4 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 6.2, traffic volumes for the 2045 Future Year No-Build Scenario were calculated. Table C8 in Appendix C shows the comparisons of historic growth rates, model output, CAGRs, and selected volumes. Some of the volumes were modified slightly to allow for the development of a balanced network.

A brief summary of the key observations and considerations from the development of the 2045 No-Build volumes are as follows:

- In general, the growth rates chosen for the forecast were in line with or slightly lower than the model CAGRs. These growth rates were largely 1.5% or less, with some exceptions. However, because the model tended to have daily volumes that were higher than the base year AADTs, the absolute change in traffic volume for the forecast (based on the model's growth rates) was lower than what was predicted by the model. Additionally, several of the roadways have shown substantial growth between 2013 (model base year) and 2017 (forecast base year); therefore, some of the growth may already be included in the 2017 volumes; therefore, the absolute change in volumes being slightly lower than those in the model is reasonable.
- Two notable exceptions to the discussion above are on Ridge Road and on Glenwood Avenue south of I-440. On Ridge Road, the model predicted relatively modest growth rates and modest growth in absolute traffic values. The chosen growth rates for the forecast on Ridge Road were largely in line with, or were slightly higher than, the model CAGRs, and resulted in a growth in traffic that was overall more than predicted by the model. On Glenwood Avenue, south of I-440, a future widening project has the potential to attract a large number of new trips. Here, the growth rates and absolute growth in traffic were relatively matched between the model and the forecast.
- Study area corridor observations:
 - I-440 Corridor – the future growth rates and model CAGRs for the I-440 corridor exhibit the characteristics described in bullet point number 1, above. The selected forecast volumes are similar to the CAGR with the absolute change in volume being 4,500 to 11,00 lower than the model; however, the AADTs along I-440 have risen by 12,000 to 16,00 (which may include some diverted traffic due to the I-40 Fortify Reconstruction) between 2013 and 2016.
 - Lake Boone Trail – the future growth rates and model CAGRs for the Lake Boone Trail corridor exhibit the characteristics described in bullet point number 1, above.
 - Ridge Road – the future growth rates and model CAGRs for the Ridge Road corridor are described in bullet point number 2, above.
 - Crabtree Valley Avenue – the future year no-build volumes on Crabtree Valley Avenue are based mostly on the growth rates for the areas in the vicinity as the TRM does not replicate volumes on this roadway effectively due to the limited connectivity in the model. The 1.6 to 2.0 percent rates reflect the growth occurring due to the widening of Blue Ridge Road and the additional capacity it provides to the area behind Crabtree Valley Mall.
 - Glenwood Avenue (US 70) – the future growth rates and model CAGRs for the Glenwood Avenue corridor south of I-440 are described in bullet point number 2, above. The selected forecast volumes for Glenwood Avenue north of I-440 are generally consistent with the CAGR along the corridor; however, the absolute volume change in volume for the forecast is lower than those included in the model due to the model over predicting trips for this corridor.
 - Creedmoor Road (SR 3009/NC 50) – the future growth rates and model CAGRs for the Creedmoor Road corridor exhibit the characteristics described in bullet point number 1, above.

- Blue Ridge Road (SR 1670)/Lead Mine Road (SR 1820) – the future growth rates for the selected forecast volumes are slightly lower than the model CAGRs while the absolute change in volume is slightly higher than the model data. The selected volumes are reasonable due to the base year model underpredicting traffic along the corridor.
 - Six Forks Road (SR 1005) – the growth rates chosen for the forecast on Six Forks Road were either in line with model CAGRs or were lower than the model CAGRs. This is partly a reflection on the amount of growth that had already occurred in the study area between 2013 (the model base year) and 2017 (for example, residential development on Six Forks Road north of I-440). Taking the model growth rates, which anticipated that growth, and then applying them to the growth that had been anticipated would be double-counting.
- Y-line traffic growth was generally consistent with the predicted growth for the adjacent TAZs.

7. FUTURE YEAR 2045 BUILD TRAFFIC FORECAST

7.1 ASSUMPTIONS

The 20450 Build traffic forecast contains all of the assumptions found in the 2045 No-Build traffic volume network discussed in Section 6.1. The I-5870 project for Alternatives 1 and 2 were coded into the TRM based on the conceptual design plans. The modifications to the model included adding the proposed interchange that connects to Crabtree Valley Avenue and widening Crabtree Valley Avenue to four-lanes from Blue Ridge Road to Creedmoor Road. Additionally, a fourth centroid connector was added to the model from Crabtree Valley Mall to Crabtree Valley Avenue to represent the access on the back side of the mall.

The build forecasts were based on the conceptual designs for each of the following alternatives:

- Alternative 1 – 2011 City of Raleigh Study Preferred Alternative, with echelon intersection at Glenwood Avenue and Blue Ridge Road/Lead Mine Road
- Alternative 2 – Diverging Diamond Interchange (DDI) Conceptual Alternative, with a Continuous Flow Intersection (CFI) option at Glenwood Avenue and Blue Ridge Road/Lead Mine Road

7.2 METHODOLOGY

The methodology for the 2045 Build forecast was the same as was utilized for the 2017 Build forecast described in Section 5.2.

7.3 DESIGN FACTORS

The 2045 model network was reviewed to see if any of the corridors experienced changes in the percent of traffic occurring in the peak hour, direction of peak travel, or directional split. The selection of design factors for the 2045 Build scenario was similar to the evaluations discussed in Section 5.3, with the selected values being the same as those selected for the 2017 Build scenarios.

7.4 TRAFFIC FORECAST VOLUMES

Based on the methodology described in Section 7.2, traffic volumes for the 2045 Future Year Build Forecast Scenario were calculated for both alternatives. Table C9 (Alternative 1) and Table C10 (Alternative 2) in Appendix C show the comparisons of model output, diversion percentages, the resulting 2013-2045 CAGR and selected volumes.

A summary of the key observations and considerations from the development of the 2017 Build volumes for each Alternative are as follows:

7.4.1 ALTERNATIVE 1

The development of the Future Year Alternative 1 forecast followed the same general process as the development of the Base Year Alternative 1 forecast. This section provides the details of the Future Year Alternative 1 forecast.

Trip Re-routing Due to Project

The following section details the changes to traffic patterns that result from the construction of the project. A graphical representation with the notes below was shown (in Section 5 of this report) for each step in Figure 5-3.

Step 1 – Wycliff Road/Lake Boone Trail Diversion

Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 800 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 1,200 that travel to and from I-440 northeast of the project area were moved to the new connection.

Step 2 – Creedmoor Road to and from Glenwood Avenue Adjustment

Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,500 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,500 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

Step 3 – Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)

Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,800 trips to and from Glenwood Avenue north of the project area and 800 trips to and from Creedmoor Road north of the project area were added.

Step 4 – Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Exiting Mall) Adjustment

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that exited the mall area by making a left turn onto Blue Ridge Road in the No Build scenario were rerouted to the Crabtree Valley Mall Driveway at Marriott Drive (400 exiting and heading north, 300 exiting and heading south), Crabtree Valley Mall Drive right-in/right-out (900 exiting and heading south), new facility (900 exiting and accessing the new facility), and the Southern Crabtree Valley Avenue access (900 exiting and heading south to the new facility).

Step 5 – Blue Ridge Road Access Converted to Right-in/Right-out Operation (Trips Entering Mall)

The design for Alternative 1 revises the mall access from Blue Ridge Road from full movement to right-in/right-out only operation. To account for this change in access, trips that entered the mall area by making a left turn from Blue Ridge Road in the No Build scenario were rerouted to the Southern Crabtree Valley Avenue access. In the 2045 Build Alternative 1 scenario, 500 trips were rerouted.

Step 6 – Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. This new path would allow these trips to exit the mall area at the Southern Crabtree Valley Avenue access. In the 2045 Build Alternative 1 scenario, 600 trips were moved to this path. Of those, 400 were assumed to be destined for I-440 westbound while 200 were assumed to be headed to I-440 eastbound. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 7 – Blue Ridge Road Mall Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a right turn from Blue Ridge Road in the No Build scenario. For the 2045 Build Alternative 1 scenario, 800 trips that traveled from I-440 west of the study area to access the mall from Blue Ridge Road in the No Build scenario and 800 trips that traveled from I-440 east of the study area to access the mall from Blue Ridge Road were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 8 – Crabtree Valley Mall Driveway at Marriott Drive Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at Marriott Drive access in the No Build scenario. For the 2045 Build Alternative 1 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 9 – Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips that traveled to I-440 west of the study area from the mall and 100 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 10 – Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 11 – Southern Crabtree Valley Avenue Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2045 Build Alternative 1 scenario, 400 trips that traveled from I-440 east of the study area to access the mall at this location were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 12 – Northern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2045 Build Alternative 1 scenario, 200 trips were relocated to the new facility.

The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 13 – Southern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the Southern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2045 Build Alternative 1 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 14 – Creedmoor to I-440 Westbound Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,800 trips that accessed I-440 westbound from Creedmoor Road using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor then travel to I-440 westbound at the interchange of the new facility and I-440.

Step 15 – Creedmoor from I-440 Eastbound Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,800 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound.

Step 16 – Glenwood Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,200 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

Step 17 – Creedmoor Road (West of Forecast Area) to and from I-440 East Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 500 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 500 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valley Avenue onto Creedmoor Road.

Step 18 – Crabtree View Place to I-440 Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,700 trips that accessed I-440 east of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel eastbound in the No Build scenario will now access the new facility then travel eastbound on I-440. 1,700 trips that travel from I-440 westbound to Crabtree View Place were also relocated in a similar manner. Similarly, 1,100 trips that accessed I-440 west of the forecast area by turning right onto Crabtree View Place then right onto Glenwood Avenue to access I-440 to travel westbound in the No Build scenario will now access the new facility and then travel westbound on I-440. 1,100 trips that travel from I-440 eastbound to access Crabtree View Place were also relocated.

Step 19 – Lead Mine Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 1 model to the No Build model, it appears that 1,000 trips that accessed I-440 westbound from Lead Mine Road by way of Glenwood Avenue in the No Build scenario will now access the new facility from Blue Ridge Road and use the new interchange to head westbound on I-440.

Step 20 – Blue Ridge Road Eastbound Right-turn Adjustment

In the Alternative 1 design, trips cannot access Glenwood Road southbound from Blue Ridge Road eastbound. So, these trips were relocated to Crabtree View Place. All 2,100 vehicles were rerouted as a result.

Step 21 – Adjust Trip Dispersion along Crabtree Valley Avenue

During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing across from the northern Crabtree Valley Avenue access, 400 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access and 400 westbound lefts exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

Step 22 – Not included in this scenario

Step 23 – Not included in this scenario

Step 24 – Not included in this scenario

Step 25 – Not included in this scenario

Step 26 – Blue Ridge Road Adjustment

After review of the forecast, it was determined that 600 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road. This assumption was based on the assumption that some drivers might use the new facility to avoid potential congestion along US 70. The number of trips was chosen based on the judgement of the forecasters.

Step 27 – Not included in this scenario

Step 28 – Not included in this scenario

Step 29 – Not included in this scenario

Step 30 – Not included in this scenario

7.4.2 ALTERNATIVE 2

The development of the Future Year Alternative 2 forecast followed the same general process as the development of the Base Year Alternative 1 forecast. This section provides the details of the Future Year Alternative 2 forecast.

Trip Re-routing Due to Project

The following section details the changes to traffic patterns that result from the construction of the project. A graphical representation with the notes below was shown (in Section 5 of this report) for each step in Figure 5-4.

Step 1 – Wycliff Road/Lake Boone Trail Diversion

Based on a comparison of the Build and No Build models, it appears that trips from the Lake Boone Trail and Wycliff Road area that currently access I-440 by way of the Lake Boone Trail interchange will change their path in the build scenario to utilize the new connection from Blue Ridge Road to I-440. To account for this diversion, 1,800 trips that travel to and from I-440 southwest of the project area were moved to the new connection and 400 that travel to and from I-440 northeast of the project area were moved to the new connection.

Step 2 – Creedmoor Road to and from Glenwood Avenue Adjustment

Based on a comparison of the Build and No Build models, it appears that some trips that travel to Glenwood Avenue northwest of the forecast area from eastbound Creedmoor Road in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. Similarly, trips that travel to Creedmoor Road from Glenwood Avenue northwest of the forecast area in the No Build scenario revise their trip to use the Glenwood Avenue interchange with I-440. This change is likely the result in the project removing traffic from Glenwood Road, making the Glenwood Avenue path faster for those that were using Creedmoor Road in the No Build scenario. Based on the model reported diversion, 1,200 trips from eastbound Creedmoor Road turning left onto Glenwood Avenue and 1,200 trips from Glenwood Avenue that exit the study area westbound on Creedmoor Road were relocated to the Glenwood Avenue interchange with I-440.

Step 3 – Trip Adjustment to Creedmoor Road and Glenwood Avenue (Northeast of Project)

Based on a comparison of the Build and No Build models, it appears that trips that were outside of the forecast network in the No Build scenario now take Glenwood Avenue to I-440. Based on the calculated model diversion, 1,800 trips to and from Glenwood Avenue north of the project area and 400 trips to and from Creedmoor Road north of the project area were added.

Step 4 – Blue Ridge Road Exit Adjustment

Some of the trips that exited the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. In this step, 900 trips that exited the mall at the Blue Ridge Road driveway and used Glenwood Avenue to head to I-440 westbound in the No Build scenario were relocated to the new facility by way of the southern mall access at Crabtree Valley Avenue as well as 700 trips exiting and heading to I-440 eastbound and 400 trips from the mall that were destined for Glenwood Avenue south of I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 5 – Blue Ridge Road Entrance Adjustment

The mall access from Blue Ridge Road remains full movement in Alternative 2. However, there was still some redistribution from the path chosen in the No Build scenario. To account for the new facility, some of the trips that accessed the mall at the Blue Ridge Road mall driveway were rerouted from Glenwood Avenue to the new facility. For this step, 600 trips from eastbound I-440, 1,100 trips from westbound I-440, and 1,000 trips from Glenwood Avenue south of I-440, that entered the mall at the Blue Ridge Driveway were relocated to the new facility and now enter the mall at the southern Crabtree Valley Avenue access. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 6 – Crabtree Valley Mall Drive Right-in/Right-out Access Exit Adjustment

The new facility was assumed to attract some of the trips that used the Crabtree Valley Mall Drive right-in/right-out access to travel to I-440 east and west of the forecast area in the No Build scenario. In this step, 500 trips were relocated from the Crabtree Valley Mall Driveway intersection with Glenwood Avenue to the southern Crabtree

Valley Avenue mall access. Of those, 400 utilized the new facility to access I-440 westbound while 100 travelled to I-440 eastbound. Also, 200 of the trips exiting the mall at the Crabtree Valley Mall Driveway intersection with Glenwood Avenue in the No Build scenario were assumed to be destined for Lead Mine Road. Due to the new configuration, those trips were rerouted to the Blue Ridge Road mall driveway, and now travel to Lead Mine Road from Blue Ridge Road. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 7 – Not used in this scenario

Step 8 – Crabtree Valley Mall Driveway at Marriott Drive Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east and west of the forecast area and Glenwood Road south of the forecast area as a left turn from Glenwood Avenue into the Crabtree Valley Mall Driveway at the Marriott Drive access in the No Build scenario. For the 2045 Build Alternative 2 scenario, 500 trips that traveled from I-440 west of the study area to access the mall from Glenwood Avenue in the No Build scenario and 400 trips that traveled from I-440 east of the study area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 9 – Crabtree Valley Mall Driveway at Marriott Drive Exit Adjustment

The new facility was assumed to attract trips that exited the mall area at the Crabtree Valley Mall Driveway at the Marriott Drive access headed for I-440 east and west of the forecast area as a right turn onto Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 2 scenario, 200 trips that traveled to I-440 west of the study area from the mall, 200 trips that traveled to I-440 east of the study area, and 100 trips that traveled to Glenwood Avenue south of the forecast area were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 10 – Crabtree Valley Mall Driveway from Creedmoor Entrance Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 west of the forecast area by traveling on Glenwood Avenue to Creedmoor Road and entering as a left turn in the No Build scenario. For the 2045 Build Alternative 2 scenario, 100 trips that traveled from I-440 west of the study area to access the mall from Creedmoor Road in the No Build scenario were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 11 – Southern Crabtree Valley Avenue Access Adjustment

The new facility was assumed to attract trips that entered the mall area from I-440 east of the forecast area and Glenwood Avenue south of the forecast area by exiting at Glenwood Avenue then travelling to Blue Ridge Road and turning right onto Crabtree Valley Avenue before entering the mall area at the southern Crabtree Valley Avenue access in the No Build scenario. For the 2045 Build Alternative 2 scenario, 300 trips that traveled from I-440 east of the study area to access the mall and 300 trips from Glenwood Avenue south of the forecast area at this location were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 12 – Northern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 east of the forecast area and Glenwood Road south of the forecast area that used Blue Ridge Road and Glenwood Avenue in the No Build scenario. For the 2045 Build Alternative 2 scenario, 200 trips from each path were relocated to the new facility. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 13 – Northern Crabtree Valley Avenue Access Exit Adjustment

The new facility was assumed to attract trips that exited the mall area from the northern Crabtree Valley Avenue access headed for I-440 west of the forecast area that used Blue Ridge Road and Glenwood Avenue to access I-440 in the No Build scenario. For the 2017 Build Alternative 2 scenario, 100 trips were relocated to the new facility that headed west on I-440 and 100 that headed east on I-440. The relocation of these trips was assumed based on the ease of access created by the new facility. The number of trips relocated was based on the volumes at mall access points and the O-D data for Crabtree Valley Mall.

Step 14 – Creedmoor to I-440 Westbound Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,700 trips that accessed I-440 westbound from Creedmoor Road east of the forecast area using Glenwood Avenue in the No Build scenario will now access the new facility from Creedmoor Road then travel to I-440 westbound at the interchange of the new facility and I-440. Also, 300 trips that turned left onto Glenwood Avenue from Creedmoor Road to head south through the forecast area in the No Build scenario were rerouted to the new facility.

Step 15 – Creedmoor from I-440 Eastbound Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,700 trips that accessed Creedmoor Road from I-440 eastbound by using Glenwood Avenue in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and head northeastbound. Also, 300 trips that originated on Glenwood Road south of the forecast area that travelled north along Glenwood Avenue to turn right onto Creedmoor Road in the No Build Scenario were rerouted to the new facility.

Step 16 – Glenwood Road to and from I-440 West Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 1,200 trips that accessed Glenwood Road directly from I-440 eastbound in the No Build scenario will now access the new facility from I-440 then turn right onto Creedmoor Road and turn left onto Glenwood Road. Similarly, 1,200 trips that accessed I-440 westbound directly from Glenwood Road in the No Build scenario will now access the new facility by turning right onto Creedmoor Road and turn left onto Crabtree Valley Avenue.

Step 17 – Creedmoor Road (West of Forecast Area) to and from I-440 East and Glenwood Avenue (South) Adjustment

Based on a comparison of the Build Alternative 2 model to the No Build model, it appears that 500 trips that accessed I-440 east of the forecast area by turning right onto Glenwood Avenue and using the Glenwood Avenue interchange with I-440 in the No Build scenario will now access the new facility by turning right onto Crabtree Valley Avenue using the new interchange. Similarly, 500 trips that accessed Creedmoor Road westbound by exiting at Glenwood Avenue and turning left onto Creedmoor Road in the No Build scenario will now access the new facility then turn left from Crabtree Valley Avenue onto Creedmoor Road. Also, 100 trips that were destined for Glenwood Avenue south of the forecast area that turned right from eastbound Creedmoor Road onto Glenwood Avenue in the No Build scenario will now use the new facility. Similarly, 100 trips that were destined for Creedmoor Road west of

the forecast area that originated from Glenwood Avenue south of the forecast area that used Glenwood Avenue in the No Build scenario will now use the new facility.

Step 18 – Crabtree View Place Adjustment

Based on the Build Alternative 2 design, all trips that utilize Crabtree View Place in the No Build scenario were relocated to the intersection of Blue Ridge Road and Glenwood Avenue.

Step 19 – This step is not included in this scenario

Step 20 – This step is not included in this scenario

Step 21 – Adjust Trip Dispersion Along Crabtree Valley Avenue

During the initial step of relocating trips to the Crabtree Valley Avenue access points, it was determined that for simplicity all trips would be allocated to the mall driveway at the Southern Crabtree Valley Avenue access. To adjust for the reality that traffic will utilize both access points, the volumes were split to be around two-thirds in and out at the southern Crabtree Valley Avenue access and one third accessing at the northern Crabtree Valley Avenue access, 700 trips that were initially assigned to the northbound right turn from Crabtree Valley Avenue to the southern Crabtree Valley Avenue access, and 700 westbound left turns exiting the southern Crabtree Valley Avenue mall access were reassigned to the northern Crabtree Valley Mall access.

Step 22 – Adjust for Alternative 2 Design at Blue Ridge Road (NE Quad)

The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northeast quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive.

Step 23 – Adjust for Alternative 2 Design at Blue Ridge Road (NW/SW Quad)

The Alternative 2 design includes a grade separated crossing of Blue Ridge Road and Crabtree Valley Avenue. Therefore, the turning movements in the northwest quadrant of that intersection needed to be rerouted through the intersection of Homewood Banks Drive and Crabtree Valley Avenue and on to Blue Ridge Road at the intersection of Blue Ridge Road and Homewood Banks Drive. Also, the movements in the southwest quadrant were relocated in the same manner.

Step 24 – Arrow Drive (West) Adjustment

To account for new connectivity provided by Alternative 2, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 eastbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility. Also, 300 trips that accessed Blue Ridge Road from Summit Park Lane to travel to I-440 westbound in the No Build scenario were rerouted to the new facility by way of the new intersection of Arrow Drive and the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 25 – Arrow Drive (East) Adjustment

To account for new connectivity provided by Alternative 2, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 eastbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed Arrow Drive from I-440 westbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. Further, 100 trips that accessed Glenwood Avenue from Arrow Drive to travel to I-440 westbound in the No Build scenario were rerouted to the new interchange. Similarly, 100 trips that accessed

Arrow Drive from I-440 eastbound by way of Glenwood Avenue in the No Build scenario were rerouted to the new interchange. The number of trips assumed was based on the judgement of the forecasters.

Step 26 – Blue Ridge Road Adjustment

After review of the forecast, it was determined that 400 trips needed to be added to the new connection that traveled from I-440 on the east side of the forecast area to Blue Ridge Road. Also, 300 trips that traveled from Glenwood Avenue south of the forecast area that turned left from Glenwood Avenue to head west on Blue Ridge Road in the No Build scenario were relocated to the new facility. Similarly, 300 trips that traveled from Blue Ridge Road west of the forecast area that turned right onto Glenwood Avenue in the No Build scenario were relocated to the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 27 – Glenwood (South) to I-440 Adjustment

In this step, 700 trips that originated on Glenwood Road south of the forecast area that accessed I-440 westbound by way of the Glenwood Avenue interchange with I-440 in the No Build Scenario are relocated to the new interchange. Also, 100 trips that travel from I-440 westbound to Glenwood Avenue by way of the Glenwood Avenue interchange with I-440 in the No Build scenario are relocated to the new interchange. The number of trips assumed was based on the judgement of the forecasters.

Step 28 – Arrow Drive Connection Adjustment

The connectivity provided by the Alternative 2 design brings additional trips into the Arrow Drive area. As a result, 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (east side) as well as 100 trips to and 100 trips from Homewood Banks Drive and Arrow Drive (west side) were added. The number of trips assumed was based on the judgement of the forecasters.

Step 29 – Ridge Road Adjustment

Due to the improved connectivity from the Ridge Road area to Crabtree View Avenue, it was assumed that some of the trips that use the Glenwood Avenue corridor to access the mall area as well as the Creedmoor Road area would utilize the new facility. As such, 2,400 trips that used the Glenwood Avenue corridor to access various locations were relocated to the new facility. Specifically, 400 trips to and from Creedmoor Road west of the forecast area, 400 trips to and from the southern Crabtree Valley Avenue access, and 400 trips to and from Blue Ridge Road west of the forecast area were rerouted to the new facility. The number of trips assumed was based on the judgement of the forecasters.

Step 30 – Northbound Ridge Road to Westbound I-440 Adjustment

The design for Alternative 2 provides a direct connection from Ridge Road to I-440 westbound. Therefore, an adjustment was made to send the trips wishing to make this movement onto the new ramp.

APPENDIX A:
HISTORIC AADT COUNT DATA

Table A1: NCDOT Historic AADT

Location	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
I-440 FROM EXIT 4 TO EXIT 5	124,000	112,000	114,000	108,000	107,000	109,000	107,000	102,000	100,000	105,000
I-440 FROM EXIT 5 TO EXIT 7	128,000	118,000	118,000	112,000	110,000	112,000	110,000	105,000	103,000	107,000
I-440 FROM EXIT 7 TO EXIT 8	148,000	138,000	138,000	134,000	135,000	132,000	128,000	123,000	122,000	129,000
I-440 FROM EXIT 8 TO EXIT 10	137,000	128,000	127,000	125,000	126,000	122,000	116,000	112,000	113,000	119,000
SR 1676 (LAKE BOONE TR) E OF BLUERIDGE RD		18,000		17,000		17,000		16,000		16,000
SR 1676 (LAKE BOONE TR) E OF MYRON DR		33,000		34,000		17,000		26,000		31,000
LAKE BOONE TR W OF STILLWATER DR		9,000		9,100		11,000		8,500		9,000
LAKE BOONE TR W OF DIXIE TR		7,400		7,600		7,700		7,000		7,600
RIDGE RD N OF PHYLLIS DR		8,700		8,000						
GLEN EDEN DR W OF RIDGE RD		8,700		7,800				7,600		7,100
GLEN EDEN DR W OF US 70/NC 50		7,500		5,700		2,900		4,700		5,100
US 70 E OF DEBLYN AVE		35,000		34,000		35,000		34,000		36,000
US 70 (GLENWOOD AVE) W OF SR 3009 CREEDMOOR RD EXT		38,000		36,000		38,000		37,000		38,000
US 70 (GLENWOOD AVE) E OF NC 50 CREEDMOOR RD		50,000		49,000		46,000		47,000		49,000
US 70/NC 50 (GLENWOOD AVE) E OF SR 1670 ALTON DR				77,000		69,000		68,000		70,000
SR 3009 N OF GLEN EDEN DR		22,000		22,000		20,000		18,000		20,000
SR 3009 (CREEDMOOR RD EXT) S OF US 70 GLENWOOD AVE		23,000				22,000		21,000		19,000
NC 50 (CREEDMOOR RD) N OF US 70 GLENWOOD RD		29,000		29,000		30,000		29,000		30,000
SR 1670 (BLUE RIDGE RD) E OF SR 1669		7,800		7,100		8,400		7,200		7,900
SR 1670 (BLUE RIDGE RD) W OF US 70/NC 50		18,000		18,000		19,000		10,000		18,000
SR 1820 (LEAD MINE RD) S OF SR 1855		29,000		28,000		28,000		28,000		30,000
SR 1820 (LEAD MINE RD) N OF NORTH HILL DR		22,000		21,000		20,000		17,000		21,000
SR 1669 N OF SR 1670 BLUE RIDGE RD		1,400		1,300		1,100		1,500		2,200
NORTH HILLS DR E OF LEAD MINE RD		7,100		7,000		7,000		5,800		7,500
SR 1005 (SIX FORKS RD) S OF LASSITER MILL RD		45,000		43,000		39,000		38,000		39,000
SR 1005 (SIX FORKS RD) S OF DARTMOUTH RD		53,000		48,000		42,000		44,000		49,000
SR 1005 (SIX FORKS RD) S OF I-440			27,000							29,000
DARTMOUTH RD W OF WINDSOR PL		1,400		1,400		1,600		1,800		2,400

Note: *Red Italics* denote numbers removed from data set due to being greater than two standard deviations away from the trend line data.

Table A1: NCDOT Historic AADT

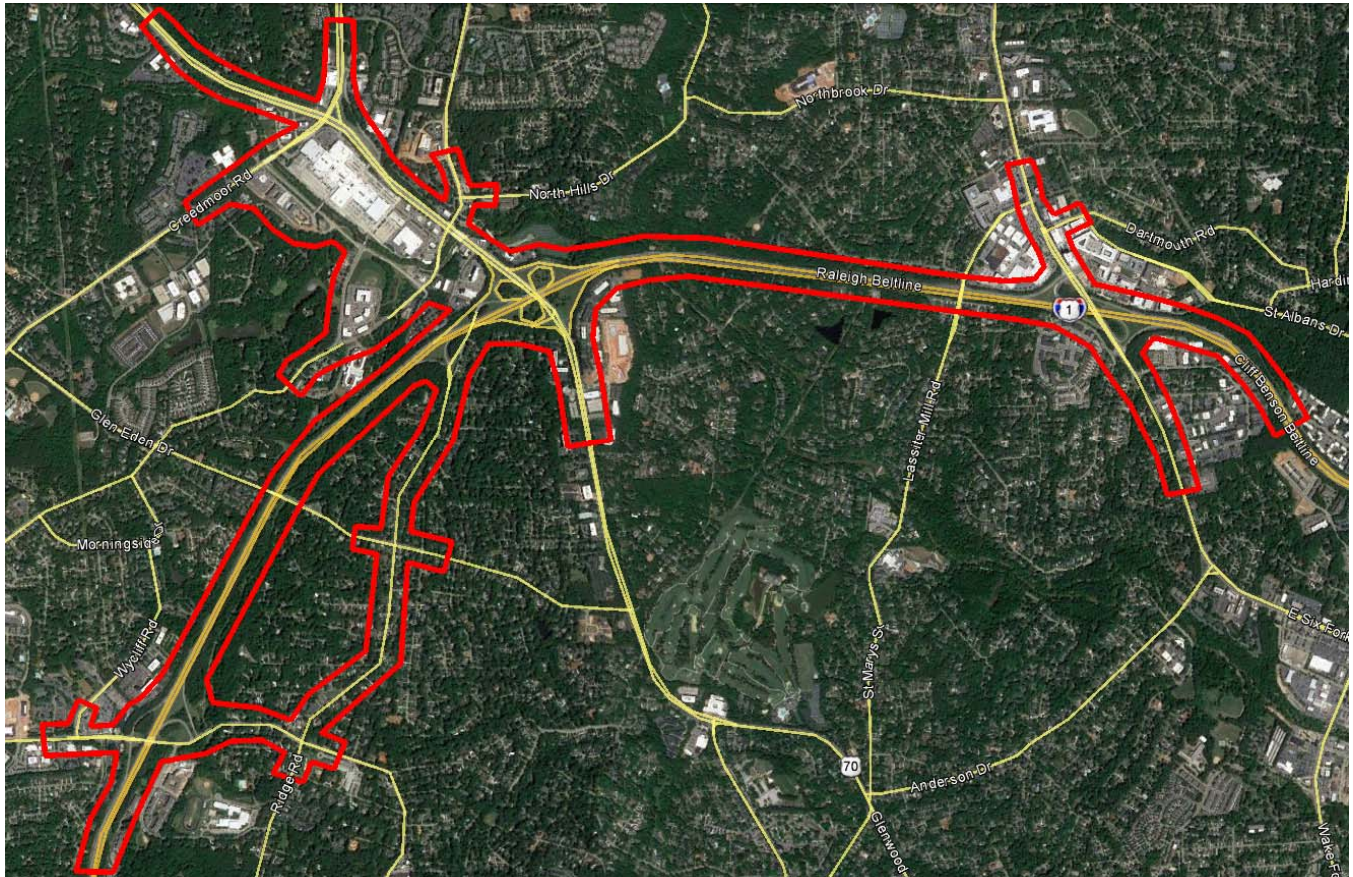
Location	2006	2005	2004	2003	2002	2001	2000	1999	1998	1997
I-440 FROM EXIT 4 TO EXIT 5	107,000	112,000	106,000	112,000	114,000	117,000	116,000		98,000	
I-440 FROM EXIT 5 TO EXIT 7	111,000	116,000	108,000	113,000	117,000	117,000	116,000		98,000	
I-440 FROM EXIT 7 TO EXIT 8	134,000	138,000	128,000	132,000	139,000	143,000	137,000		<i>105,000</i>	
I-440 FROM EXIT 8 TO EXIT 10	124,000	127,000	118,000	121,000	128,000	130,000	125,000		<i>102,000</i>	
SR 1676 (LAKE BOONE TR) E OF BLUERIDGE RD		16,000		15,000		16,000			18,000	
SR 1676 (LAKE BOONE TR) E OF MYRON DR		34,000		31,000		32,000			30,000	
LAKE BOONE TR W OF STILLWATER DR		8,800		10,000						
LAKE BOONE TR W OF DIXIE TR		7,500		8,100						
RIDGE RD N OF PHYLLIS DR										
GLEN EDEN DR W OF RIDGE RD		6,300		6,000		6,500			7,100	
GLEN EDEN DR W OF US 70/NC 50		4,400		4,600		4,500			4,500	
US 70 E OF DEBLYN AVE		38,000		37,000		<i>48,000</i>			39,000	
US 70 (GLENWOOD AVE) W OF SR 3009 CREEDMOOR RD EXT		40,000		38,000						
US 70 (GLENWOOD AVE) E OF NC 50 CREEDMOOR RD		54,000		49,000						
US 70/NC 50 (GLENWOOD AVE) E OF SR 1670 ALTON DR		72,000		75,000						
SR 3009 N OF GLEN EDEN DR		17,000				16,000			14,000	
SR 3009 (CREEDMOOR RD EXT) S OF US 70 GLENWOOD AVE		20,000		19,000		19,000			20,000	
NC 50 (CREEDMOOR RD) N OF US 70 GLENWOOD RD		30,000		<i>27,000</i>		31,000	32,000		29,000	
SR 1670 (BLUE RIDGE RD) E OF SR 1669		7,300		6,800		7,300			11,000	
SR 1670 (BLUE RIDGE RD) W OF US 70/NC 50		18,000		11,000						
SR 1820 (LEAD MINE RD) S OF SR 1855		29,000		29,000						
SR 1820 (LEAD MINE RD) N OF NORTH HILL DR		21,000		18,000						
SR 1669 N OF SR 1670 BLUE RIDGE RD		1,600		2,200		2,900			4,300	
NORTH HILLS DR E OF LEAD MINE RD		6,400		8,200		8,500			11,000	
SR 1005 (SIX FORKS RD) S OF LASSITER MILL RD		42,000		43,000		39,000			42,000	
SR 1005 (SIX FORKS RD) S OF DARTMOUTH RD		45,000		44,000		46,000			48,000	
SR 1005 (SIX FORKS RD) S OF I-440		29,000		31,000		30,000			34,000	
DARTMOUTH RD W OF WINDSOR PL		2,000		2,500						

Note: *Red Italics* denote numbers removed from data set due to being greater than two standard deviations away from the trend line data.

APPENDIX B:
PROJECT CORRESPONDENCE

Study Area Questionnaire Sent to Local Planners

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP Project No. I-5870, which would modify the interchange of I-440 at Ridge Rd to convert it to a full movement with a connection to Crabtree Valley Ave in Wake County. The forecast includes base year (2017) and future year (2045) forecasts. The forecast study area is shown in the following figure:



We have reviewed the CAMPO Draft 2045 Metropolitan Transportation Plan (final adoption pending) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. I have listed a few questions below that will help us in the development in the traffic forecast. We would greatly appreciate your time in answering these questions. You may answer the questions in text format below and return them to me at:

lee@pt-engineering.net.

If you would rather discuss the questions over the phone, I will be following up with a phone call early next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years in the study area has increased overall, and that the traffic growth appears to have accelerated in recent years.
 - a. On I-440, the 20-year growth rates are less than 0.5% per year, while the 10-year growth rates are all 1.75% to 2.00% per year.
 - i. Do you agree with this statement?
 - ii. What growth patterns have you noticed?
 - iii. Would you expect the growth rate to change substantially in the next 20 years?
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year?

Study Area Questionnaire Sent to Local Planners

- b. On Glenwood Ave (US 70) the 20-year growth rates show a decrease in traffic, while the 10-year growth range from -0.1% to 1.56% per year.
 - i. Do you agree with this statement?
 - ii. What growth patterns have you noticed?
 - iii. Would you expect the growth rate to change substantially in the next 20 years?
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year?
- 2) The last two traffic counts on I-440 (in 2016 performed by NCDOT Traffic Survey Group and in 2017 for this forecast) show a substantial jump in volume from the previous years' volumes. The 2015 AADT Between Glenwood Ave and Six Forks Rd was around 140,000, the 2016 AADT was around 150,000, and the 2017 count for this study showed an AADT of more than 160,000 vehicles. Is this something that you have noticed? To what circumstances could such a change in traffic be attributable?
- 3) Aside from school being in session and the heavy shopping activity around the Christmas holiday, are there any noticeable seasonal differences in traffic?
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the current population of Wake County is approximately 1,048,800 and is projected to grow by 1.8% per year to 1,511,400 in 2037. The population projections for Wake County that are contained within the Draft 2045 MTP show a projected population growth rate of approximately 1.9% per year to the year 2045.
 - a. Do you think that the 1.8% to 1.9% population growth rate is reasonable for this area? If not, what is a more likely rate for the study area?
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?
- 5) The Triangle Regional Travel Demand Model data shows a varied level of traffic growth throughout the study area, but with most study corridors showing a growth rate between 1.0 and 1.5 percent per year between 2013 and 2045.
 - a. I-440 has a growth rate of roughly 1.25% per year, with the growth rate lower on the western end of the study area and higher on the eastern end. Do you think that the 1.25% traffic volume growth rate is reasonable for I-440 or do you think it will be higher or lower?
 - b. North of I-440, Glenwood Ave (US 70) has a growth rate of roughly 0.6% per year. Do you think that this traffic volume growth rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower?
 - c. South of I-440, Glenwood Ave (US 70) has a growth rate of roughly 1.7% per year, mostly due to the proposed widening to six-lanes. Do you think that this traffic volume growth rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower?
 - d. South of I-440, Ridge Rd has a growth rate of roughly 1.0% per year. Do you think that this traffic volume growth rate is reasonable for this section of Ridge Rd or do you think it will be higher or lower?
 - e. The Model has predicted a traffic growth rate of 0.16% out of the Crabtree Valley Mall parcel. Do you think that this growth rate is reasonable for this parcel or do you think it will be higher or lower?
 - f. The traffic growth predicted by the Model west of the Crabtree Valley Mall area is shown mostly on the Blue Ridge Rd corridor as opposed to Creedmoor Rd. Blue Ridge Rd (west

Study Area Questionnaire Sent to Local Planners

of the mall) has a growth rate of 3.1% per year, and Creedmoor Rd (west of the mall) has a growth rate of 1.1% per year. Do you think that these growth rates are reasonable or do you think they will be higher or lower?

- 6) The Metropolitan Transportation Plan (MTP) includes ten projects in the vicinity of the forecast that has the potential to affect the traffic volumes in the traffic forecast study area:
- i. A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave
 - ii. A101 (2035), U-2823 – US 70 – Widening 4 lanes to 6 lanes from Lumley/Westgate Rd to Duraleigh/Millbrook Rd
 - iii. A195 (2035), no STIP – Creedmoor Rd – Widening 4 lanes to 6 lanes from Glenwood Ave to Strickland Rd
 - iv. A135 (2035), no STIP – Lead Mine Rd – Widening 3 lanes to 4 lanes from Town & Country Rd to Millbrook Rd
 - v. A446 (2035), no STIP – Glenwood Avenue – Widening 4 lanes to 6 lanes from Womans Club Dr to Oberlin Rd
 - vi. A448 (2025), no STIP – Six Forks Rd – Widening 4 lanes to 6 lanes from Ramblewood Road to Lynn Road
 - vii. F83 (2025), I-5708 – I-440 Interchange Improvements at Wake Forest Road (SR 2000)
 - viii. F10 (2025), U-2719 – I-440 Widening – Widening 4 lanes to 6 lanes from US 1/64 to Wade Avenue
 - ix. A562 (2025), U-5936 – Wade Avenue Widening – Widening 4 lanes to 6 lanes from I-40 to I-440
 - x. A21 (2035), no STIP – Lake Boone Trail Ext – New 4-lane roadway from Blue Ridge Rd to Edwards Mill Ext
- a. How do you think these projects will affect traffic volumes in the study area?
- b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?
- 7) The eastern end of the forecast study area overlaps with a portion of the previous traffic forecast for I-5708 (I-440/Wake Forest Rd Interchange Improvements Traffic Forecast Amendment), performed in 2017. The western end of the forecast study area overlaps with a portion of the previous traffic forecast for U-2719 (I-440 Widening from Walnut St to Wade Ave), performed in 2012 and updated in 2017. Are you aware of any other previous traffic forecasts that were performed in or near the study area?
- 8) Do you expect the future commercial activity at the Crabtree Valley Mall to remain at its present levels, or do you expect the levels to increase or decrease?
- 9) We are currently aware of the following developments within the study area:
- i. North Hills East Tract (Six Forks Rd & Front St) – residential, hotel, retail, and office (735,000 sq ft)
 - ii. North Hills East II (St. Albans Dr & Church at North Hills St) – apartment complex (360,000 sq ft) and mixed office/residential
 - iii. Creekside Lakeside Residences (Blue Ridge Rd & Homewood Banks Dr) – 7 apartment buildings (245,000 sq ft)
 - iv. Homebanc (Glenwood Ave & Creedmoor Rd) – Office and commercial use (225,000 sq ft)

Study Area Questionnaire Sent to Local Planners

- v. St. Albans Subdivision (St. Albans Dr & Wake Forest Rd) – 38 acres
- vi. 2717 Glenwood Ave – office (10,000 sq ft)
- vii. Six Forks Office 1 (Six Forks Rd & Northwood Dr) – office (30,000 sq ft)

- a. Do you know of any other substantial ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast?

10) Do you have any additional comments that would be helpful in our development of the traffic forecast?

11) This questionnaire is being sent to the following individuals:

- i. Chris Lukasina, Capital Area MPO – Executive Director
- ii. Alex Rickard, Capital Area MPO – Deputy Director
- iii. Tim Gardiner, Wake County – Transportation Planner
- iv. Eric Lamb, City of Raleigh – Transportation Planning Manager
- v. David Keilson, NCDOT Division 5 – Division Planning Engineer
- vi. John Sandor, NCDOT Division 5 – Deputy Division Traffic Engineer
- vii. M. Scott Wheeler, NCDOT Division 5 – District 1 Engineer
- viii. Boyd Tharrington, NCDOT Division 5 Construction Engineer
- ix. Rupal Desai, NCDOT TPD
- x. Scott Walston, NCDOT TPD

- a. Are there any other individuals whom you think we should contact to discuss this forecast?

Comments completed by Alex Rickard via email – 04/02/2018

Lee,

I don't have any comments on the travel forecasts other than to double-check you have the latest version, networks, and SE data for TRM and the MTP. The MTP was adopted and there may be been a few minor revisions depending on when you obtained your information.

There are some additional widening projects on Lead Mine that didn't make your list (A135b & A135c)

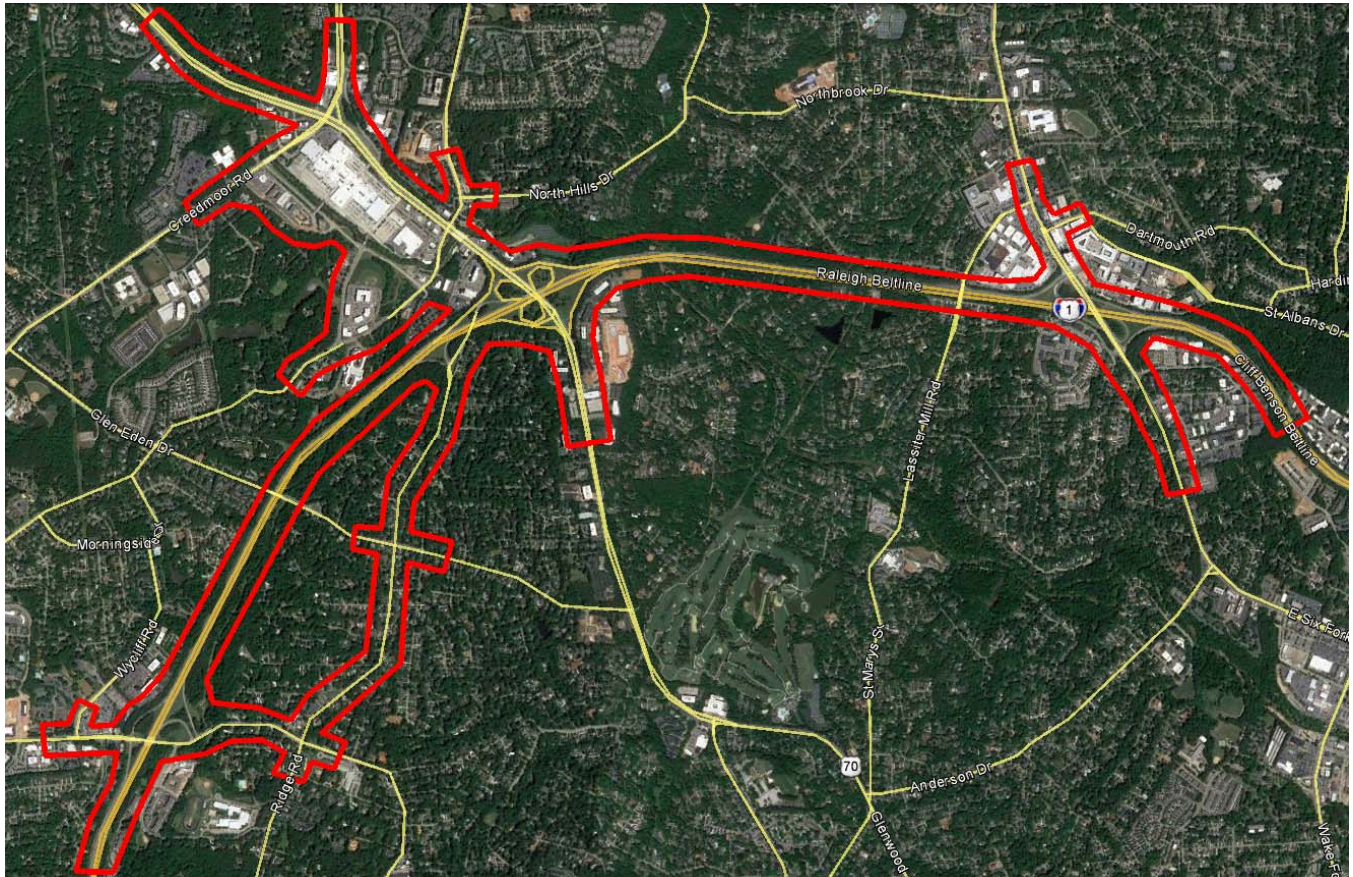
You might also want to review the work NCDOT has done on the U-5518 project (US 70 from I-540 to TW Alexander). I realize this is outside your study area but figured you may want to compare growth assumptions for the Glenwood corridor.

Thanks,
-Alex

Alex Rickard
Deputy Director
Capital Area Metropolitan Planning Organization
421 Fayetteville Street, Suite 203
Raleigh, NC 27601
919.996.4396

Comments completed by Alex Rickard via email – 04/02/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP Project No. I-5870, which would modify the interchange of I-440 at Ridge Rd to convert it to a full movement with a connection to Crabtree Valley Ave in Wake County. The forecast includes base year (2017) and future year (2045) forecasts. The forecast study area is shown in the following figure:



We have reviewed the CAMPO Draft 2045 Metropolitan Transportation Plan (final adoption pending) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. I have listed a few questions below that will help us in the development in the traffic forecast. We would greatly appreciate your time in answering these questions. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

If you would rather discuss the questions over the phone, I will be following up with a phone call early next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years in the study area has increased overall, and that the traffic growth appears to have accelerated in recent years.
 - a. On I-440, the 20-year growth rates are less than 0.5% per year, while the 10-year growth rates are all 1.75% to 2.00% per year.
 - i. Do you agree with this statement?
 - ii. What growth patterns have you noticed?
 - iii. Would you expect the growth rate to change substantially in the next 20 years?
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year?

Comments completed by Alex Rickard via email – 04/02/2018

- b. On Glenwood Ave (US 70) the 20-year growth rates show a decrease in traffic, while the 10-year growth range from -0.1% to 1.56% per year.
 - i. Do you agree with this statement?
 - ii. What growth patterns have you noticed?
 - iii. Would you expect the growth rate to change substantially in the next 20 years?
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year?
- 2) The last two traffic counts on I-440 (in 2016 performed by NCDOT Traffic Survey Group and in 2017 for this forecast) show a substantial jump in volume from the previous years' volumes. The 2015 AADT Between Glenwood Ave and Six Forks Rd was around 140,000, the 2016 AADT was around 150,000, and the 2017 count for this study showed an AADT of more than 160,000 vehicles. Is this something that you have noticed? To what circumstances could such a change in traffic be attributable?

Is there a pattern on I-440 that may be related to Fortify and work on I-40?

- 3) Aside from school being in session and the heavy shopping activity around the Christmas holiday, are there any noticeable seasonal differences in traffic?
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the current population of Wake County is approximately 1,048,800 and is projected to grow by 1.8% per year to 1,511,400 in 2037. The population projections for Wake County that are contained within the Draft 2045 MTP show a projected population growth rate of approximately 1.9% per year to the year 2045.
 - a. Do you think that the 1.8% to 1.9% population growth rate is reasonable for this area? If not, what is a more likely rate for the study area?

The MTP takes the most recent OSBM forecasts and extends that forecast out to the planning year if it is beyond the last year of the OSBM forecast. The growth rate is consistent with OSBM forecasting and simply extended out to the planning year.

- b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area?
- 5) The Triangle Regional Travel Demand Model data shows a varied level of traffic growth throughout the study area, but with most study corridors showing a growth rate between 1.0 and 1.5 percent per year between 2013 and 2045.
 - a. I-440 has a growth rate of roughly 1.25% per year, with the growth rate lower on the western end of the study area and higher on the eastern end. Do you think that the 1.25% traffic volume growth rate is reasonable for I-440 or do you think it will be higher or lower?
 - b. North of I-440, Glenwood Ave (US 70) has a growth rate of roughly 0.6% per year. Do you think that this traffic volume growth rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower?
 - c. South of I-440, Glenwood Ave (US 70) has a growth rate of roughly 1.7% per year, mostly due to the proposed widening to six-lanes. Do you think that this traffic volume growth rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower?

Comments completed by Alex Rickard via email – 04/02/2018

- d. South of I-440, Ridge Rd has a growth rate of roughly 1.0% per year. Do you think that this traffic volume growth rate is reasonable for this section of Ridge Rd or do you think it will be higher or lower?
 - e. The Model has predicted a traffic growth rate of 0.16% out of the Crabtree Valley Mall parcel. Do you think that this growth rate is reasonable for this parcel or do you think it will be higher or lower?
 - f. The traffic growth predicted by the Model west of the Crabtree Valley Mall area is shown mostly on the Blue Ridge Rd corridor as opposed to Creedmoor Rd. Blue Ridge Rd (west of the mall) has a growth rate of 3.1% per year, and Creedmoor Rd (west of the mall) has a growth rate of 1.1% per year. Do you think that these growth rates are reasonable or do you think they will be higher or lower?
- 6) The Metropolitan Transportation Plan (MTP) includes ten projects in the vicinity of the forecast that has the potential to affect the traffic volumes in the traffic forecast study area:
- i. A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave
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 - iii. A195 (2035), no STIP – Creedmoor Rd – Widening 4 lanes to 6 lanes from Glenwood Ave to Strickland Rd
 - iv. **A135a** (2035), no STIP – Lead Mine Rd – Widening 3 lanes to 4 lanes from Town & Country Rd to Millbrook Rd
 - v. A446 (2035), no STIP – Glenwood Avenue – Widening 4 lanes to 6 lanes from Womans Club Dr to Oberlin Rd
 - vi. A448 (2025), no STIP – Six Forks Rd – Widening 4 lanes to 6 lanes from Ramblewood Road to Lynn Road
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 - viii. F10 (2025), U-2719 – I-440 Widening – Widening 4 lanes to 6 lanes from US 1/64 to Wade Avenue
 - ix. A562 (2025), U-5936 – Wade Avenue Widening – Widening 4 lanes to 6 lanes from I-40 to I-440
 - x. A21 (2035), no STIP – Lake Boone Trail Ext – New 4-lane roadway from Blue Ridge Rd to Edwards Mill Ext
- a. How do you think these projects will affect traffic volumes in the study area?
 - b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area?

A135b, Lead Mine Road, widening 2 to 4 lanes from Millbrook Road to Lynn Road.

- 7) The eastern end of the forecast study area overlaps with a portion of the previous traffic forecast for I-5708 (I-440/Wake Forest Rd Interchange Improvements Traffic Forecast Amendment), performed in 2017. The western end of the forecast study area overlaps with a portion of the previous traffic forecast for U-2719 (I-440 Widening from Walnut St to Wade Ave), performed in 2012 and updated in 2017. Are you aware of any other previous traffic forecasts that were performed in or near the study area?

U-5518 might have forecast information on US 70 Glenwood that may be useful.

Comments completed by Alex Rickard via email – 04/02/2018

8) Do you expect the future commercial activity at the Crabtree Valley Mall to remain at its present levels, or do you expect the levels to increase or decrease?

9) We are currently aware of the following developments within the study area:

- i. North Hills East Tract (Six Forks Rd & Front St) – residential, hotel, retail, and office (735,000 sq ft)
 - ii. North Hills East II (St. Albans Dr & Church at North Hills St) – apartment complex (360,000 sq ft) and mixed office/residential
 - iii. Creekside Lakeside Residences (Blue Ridge Rd & Homewood Banks Dr) – 7 apartment buildings (245,000 sq ft)
 - iv. Homebanc (Glenwood Ave & Creedmoor Rd) – Office and commercial use (225,000 sq ft)
 - v. St. Albans Subdivision (St. Albans Dr & Wake Forest Rd) – 38 acres
 - vi. 2717 Glenwood Ave – office (10,000 sq ft)
 - vii. Six Forks Office 1 (Six Forks Rd & Northwood Dr) – office (30,000 sq ft)
- a. Do you know of any other substantial ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast?

10) Do you have any additional comments that would be helpful in our development of the traffic forecast?

11) This questionnaire is being sent to the following individuals:

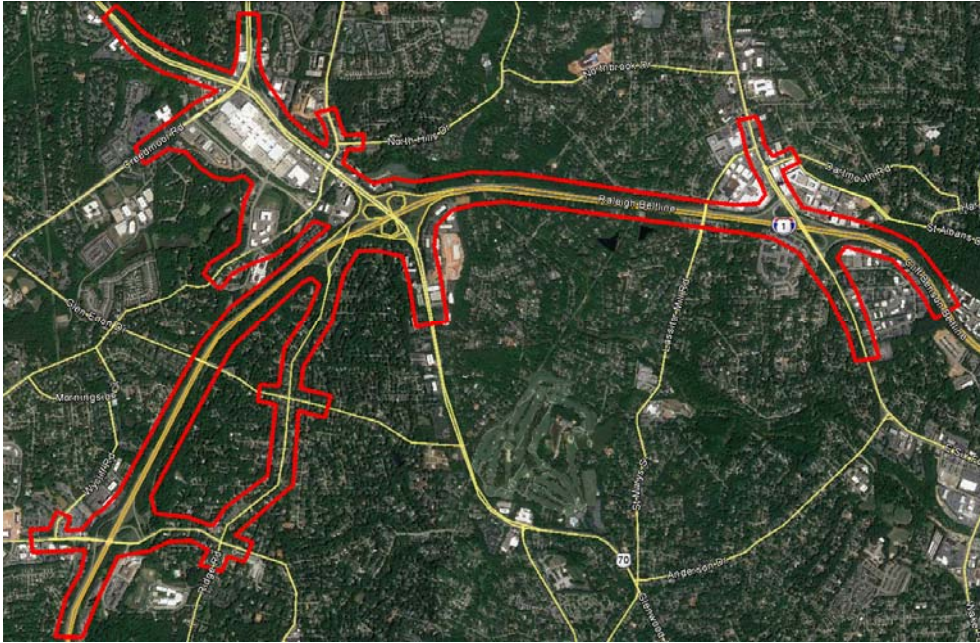
- i. Chris Lukasina, Capital Area MPO – Executive Director
 - ii. Alex Rickard, Capital Area MPO – Deputy Director
 - iii. Tim Gardiner, Wake County – Transportation Planner
 - iv. Eric Lamb, City of Raleigh – Transportation Planning Manager
 - v. David Keilson, NCDOT Division 5 – Division Planning Engineer
 - vi. John Sandor, NCDOT Division 5 – Deputy Division Traffic Engineer
 - vii. M. Scott Wheeler, NCDOT Division 5 – District 1 Engineer
 - viii. Boyd Tharrington, NCDOT Division 5 Construction Engineer
 - ix. Rupal Desai, NCDOT TPD
 - x. Scott Walston, NCDOT TPD
- a. Are there any other individuals whom you think we should contact to discuss this forecast?

Ken A. Bowers, AICP
Director
City Planning
City of Raleigh
One Exchange Plaza, Suite 304
Raleigh, NC 27602-0590

919-996-2633
fax 996-2684
kenneth.bowers@raleighnc.gov

Comments completed by Mark Eatman via email – 03/21/2018

Patriot Transportation Engineering is currently in the process of developing a traffic forecast for NCDOT STIP Project No. I-5870, which would modify the interchange of I-440 at Ridge Rd to convert it to a full movement with a connection to Crabtree Valley Ave in Wake County. The forecast includes base year (2017) and future year (2045) forecasts. The forecast study area is shown in the following figure:



We have reviewed the CAMPO Draft 2045 Metropolitan Transportation Plan (final adoption pending) and are seeking input from local planners and engineers who are familiar with the area. We have identified you as a local representative. I have listed a few questions below that will help us in the development in the traffic forecast. We would greatly appreciate your time in answering these questions. You may answer the questions in text format below and return them to me at: lee@pt-engineering.net.

Commented [MRE1]: The has been approved

If you would rather discuss the questions over the phone, I will be following up with a phone call early next week. Thank you in advance for your time and please let me know if you have any questions.

- 1) Current and historical traffic trends indicate that the traffic growth over the last 20 years in the study area has increased overall, and that the traffic growth appears to have accelerated in recent years.
 - a. On I-440, the 20-year growth rates are less than 0.5% per year, while the 10-year growth rates are all 1.75% to 2.00% per year.
 - i. Do you agree with this statement? **Yes**
 - ii. What growth patterns have you noticed? **I've noticed increased through trips along I-440 due to increased development activity as well as increased traffic accessing sites such as North Hills and Crabtree mall.**

Comments completed by Mark Eatman via email – 03/21/2018

- iii. Would you expect the growth rate to change substantially in the next 20 years?
Growth rates may go up due to increasing population and expected developmental activity
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year? I'm not sure
 - b. On Glenwood Ave (US 70) the 20-year growth rates show a decrease in traffic, while the 10-year growth range from -0.1% to 1.56% per year.
 - i. Do you agree with this statement? If historical AADT data has been referenced, then yes.
 - ii. What growth patterns have you noticed? Traffic in this area, while heavy has seemed to have stayed about the same.
 - iii. Would you expect the growth rate to change substantially in the next 20 years? I think traffic could increase as alternate routes (i.e. I-40 to Durham) become more congested and the areas within and surrounding the study area grow.
 - iv. Do you expect the growth rate to increase in the future? If so, by what percent per year? Yes. Not sure.
- 2) The last two traffic counts on I-440 (in 2016 performed by NCDOT Traffic Survey Group and in 2017 for this forecast) show a substantial jump in volume from the previous years' volumes. The 2015 AADT Between Glenwood Ave and Six Forks Rd was around 140,000, the 2016 AADT was around 150,000, and the 2017 count for this study showed an AADT of more than 160,000 vehicles. Is this something that you have noticed? To what circumstances could such a change in traffic be attributable? Increased population, gas prices, overall higher VMT trends, increased development activity/completed developments.
- 3) Aside from school being in session and the heavy shopping activity around the Christmas holiday, are there any noticeable seasonal differences in traffic? No
- 4) According to the North Carolina Office of State Budget and Management (OSBM) the current population of Wake County is approximately 1,048,800 and is projected to grow by 1.8% per year to 1,511,400 in 2037. The population projections for Wake County that are contained within the Draft 2045 MTP show a projected population growth rate of approximately 1.9% per year to the year 2045.
- a. Do you think that the 1.8% to 1.9% population growth rate is reasonable for this area? If not, what is a more likely rate for the study area? Yes
 - b. Do you know of any other population projections for this area that may be helpful as we review the growth in the area? No
- 5) The Triangle Regional Travel Demand Model data shows a varied level of traffic growth throughout the study area, but with most study corridors showing a growth rate between 1.0 and 1.5 percent per year between 2013 and 2045.
- a. I-440 has a growth rate of roughly 1.25% per year, with the growth rate lower on the western end of the study area and higher on the eastern end. Do you think that the 1.25% traffic volume growth rate is reasonable for I-440 or do you think it will be higher or lower? Yes
 - b. North of I-440, Glenwood Ave (US 70) has a growth rate of roughly 0.6% per year. Do you think that this traffic volume growth rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower? Yes
 - c. South of I-440, Glenwood Ave (US 70) has a growth rate of roughly 1.7% per year, mostly due to the proposed widening to six-lanes. Do you think that this traffic volume growth

Comments completed by Mark Eatman via email – 03/21/2018

rate is reasonable for this section of Glenwood Ave or do you think it will be higher or lower? **Yes**

- d. South of I-440, Ridge Rd has a growth rate of roughly 1.0% per year. Do you think that this traffic volume growth rate is reasonable for this section of Ridge Rd or do you think it will be higher or lower? **Yes**
- e. The Model has predicted a traffic growth rate of 0.16% out of the Crabtree Valley Mall parcel. Do you think that this growth rate is reasonable for this parcel or do you think it will be higher or lower? **Yes**
- f. The traffic growth predicted by the Model west of the Crabtree Valley Mall area is shown mostly on the Blue Ridge Rd corridor as opposed to Creedmoor Rd. Blue Ridge Rd (west of the mall) has a growth rate of 3.1% per year, and Creedmoor Rd (west of the mall) has a growth rate of 1.1% per year. Do you think that these growth rates are reasonable or do you think they will be higher or lower? **Yes**

- 6) The Metropolitan Transportation Plan (MTP) includes ten projects in the vicinity of the forecast that has the potential to affect the traffic volumes in the traffic forecast study area:
 - i. A682 (2025), no STIP – Blue Ridge Road – Widening 2 lanes to 3 lanes from Duraleigh to Crabtree Valley Ave **No major change**
 - ii. A101 (2035), U-2823 – US 70 – Widening 4 lanes to 6 lanes from Lumley/Westgate Rd to Duraleigh/Millbrook Rd **Minor change as this would relieve congestion for through movements along US 70 making the route slightly more desirable**
 - iii. A195 (2035), no STIP – Creedmoor Rd – Widening 4 lanes to 6 lanes from Glenwood Ave to Strickland Rd **Minor to Moderate change to traffic near and around Crabtree Valley mall.**
 - iv. A135 (2035), no STIP – Lead Mine Rd – Widening 3 lanes to 4 lanes from Town & Country Rd to Millbrook Rd **No major change**
 - v. A446 (2035), no STIP – Glenwood Avenue – Widening 4 lanes to 6 lanes from Womans Club Dr to Oberlin Rd **Minor change as this would relieve congestion for through movements along US 70 making the route slightly more desirable**
 - vi. A448 (2025), no STIP – Six Forks Rd – Widening 4 lanes to 6 lanes from Ramblewood Road to Lynn Road **Minor change as this would relieve congestion for through movements along Six Forks Rd making the route slightly more desirable**
 - vii. F83 (2025), I-5708 – I-440 Interchange Improvements at Wake Forest Road (SR 2000) **No major change**
 - viii. F10 (2025), U-2719 – I-440 Widening – Widening 4 lanes to 6 lanes from US 1/64 to Wade Avenue **Moderate to Major changes as this would ease traffic in a congested area on the western end of the study area**
 - ix. A562 (2025), U-5936 – Wade Avenue Widening – Widening 4 lanes to 6 lanes from I-40 to I-440 **No major change**
 - x. A21 (2035), no STIP – Lake Boone Trail Ext – New 4-lane roadway from Blue Ridge Rd to Edwards Mill Ext **No major change**
 - a. How do you think these projects will affect traffic volumes in the study area? **See above**
 - b. Do you know of any reasonably foreseeable transportation projects that are not identified above that may affect traffic volumes in the traffic forecast study area? **No**
- 7) The eastern end of the forecast study area overlaps with a portion of the previous traffic forecast for I-5708 (I-440/Wake Forest Rd Interchange Improvements Traffic Forecast Amendment), performed in 2017. The western end of the forecast study area overlaps with a portion of the previous traffic forecast for U-2719 (I-440 Widening from Walnut St to Wade Ave), performed in

Comments completed by Mark Eatman via email – 03/21/2018

2012 and updated in 2017. Are you aware of any other previous traffic forecasts that were performed in or near the study area? **No**

- 8) Do you expect the future commercial activity at the Crabtree Valley Mall to remain at its present levels, or do you expect the levels to increase or decrease? **Slightly decrease. The parcels are already mostly maxed out and there's a declining trend for retail stores and malls. However, future redevelopment could make the site more viable.**

- 9) We are currently aware of the following developments within the study area:

- i. North Hills East Tract (Six Forks Rd & Front St) – residential, hotel, retail, and office (735,000 sq ft)
 - ii. North Hills East II (St. Albans Dr & Church at North Hills St) – apartment complex (360,000 sq ft) and mixed office/residential
 - iii. Creekside Lakeside Residences (Blue Ridge Rd & Homewood Banks Dr) – 7 apartment buildings (245,000 sq ft)
 - iv. Homebanc (Glenwood Ave & Creedmoor Rd) – Office and commercial use (225,000 sq ft)
 - v. St. Albans Subdivision (St. Albans Dr & Wake Forest Rd) – 38 acres
 - vi. 2717 Glenwood Ave – office (10,000 sq ft)
 - vii. Six Forks Office 1 (Six Forks Rd & Northwood Dr) – office (30,000 sq ft)
- a. Do you know of any other substantial ongoing or planned developments in the vicinity of the traffic forecast area that may affect our traffic forecast? **No**

- 10) Do you have any additional comments that would be helpful in our development of the traffic forecast? **No**

- 11) This questionnaire is being sent to the following individuals:

- i. Chris Lukasina, Capital Area MPO – Executive Director
 - ii. Alex Rickard, Capital Area MPO – Deputy Director
 - iii. Tim Gardiner, Wake County – Transportation Planner
 - iv. Eric Lamb, City of Raleigh – Transportation Planning Manager
 - v. David Keilson, NCDOT Division 5 – Division Planning Engineer
 - vi. John Sandor, NCDOT Division 5 – Deputy Division Traffic Engineer
 - vii. M. Scott Wheeler, NCDOT Division 5 – District 1 Engineer
 - viii. Boyd Tharrington, NCDOT Division 5 Construction Engineer
 - ix. Rupal Desai, NCDOT TPD **Not needed, I've replaced Rupal within TPD**
 - x. Scott Walston, NCDOT TPD
- a. Are there any other individuals whom you think we should contact to discuss this forecast? **No**

NOTES OF CONVERSATION WITH TIM GARDINER, 03/29/2018

Would defer to City of Raleigh for most questions.

Would lean on the growth predicted by the MPO over other sources.

In terms of macro trends for the area, US 70 and I-440 are serving more than local traffic, and we have nothing that says the information produced by the MPO isn't the best tools to use.

For minutia details in the questionnaire, we should defer to the City (such as future development information).

For future improvements, we don't have any comments above and beyond what's been done at the MTP level.

NOTES OF CONVERSATION WITH DAVID KEILSON, 04/13/2018

Strong growth would be expected on I-440 given the population projections, but not necessarily during the peak hours because we're already at capacity.

We just got funding for an Advanced Coordinated Ramp Metering study, which could affect route choice. Depending on the effectiveness, we could get closer to theoretical capacity.

Peak hour volumes are likely to be capacity-constrained.

There could be some affect in traffic patterns from I-40 construction on the south side of Raleigh, but the effects would be hard to quantify.

The conversion of US 70 to a freeway could result in a good number of people taking US 70 instead of I-440.

There are no unknown transportation projects, but there might be a need for some auxiliary lanes on I-440 in the future (e.g., between Lake Boone and Glenwood).

Lee Klieman

From: Desai, Rupal P <rpdesai@ncdot.gov>
Sent: Tuesday, March 20, 2018 1:13 PM
To: Lee Klieman
Subject: RE: [External] NCDOT STIP I-5870 Traffic Forecast Questionnaire

Lee,

Please forward this questionnaire to Mark Eatman (New CAMPO coordinator). I recently moved in STIP unit.

Sincerely,

Rupal Desai, P.E.

STIP, Senior Program Engineer, Central Region
Division of Planning and Programming
North Carolina Department of Transportation

919 707 4645 office
rpdesai@ncdot.gov

1534 Mail Service Center
Raleigh, NC 27699-1534



*Email correspondence to and from this address is subject to the
North Carolina Public Records Law and may be disclosed to third parties.*

From: Lee Klieman [mailto:Lee@pt-engineering.net]
Sent: Tuesday, March 20, 2018 12:10 PM
To: chris.lukasina@campo-nc.us; alex.rickard@campo-nc.us; tim.gardiner@wakegov.com; eric.lamb@raleighnc.gov; Keilson, David P <dpkeilson@ncdot.gov>; Sandor, John E <jesandor@ncdot.gov>; Wheeler, Millard S <mwheeler@ncdot.gov>; Tharrington, Emmette B <btharrington@ncdot.gov>; Desai, Rupal P <rpdesai@ncdot.gov>; Walston, Scott W (TPB) <swalston@ncdot.gov>
Cc: Peter Trencansky <peter@pt-engineering.net>
Subject: [External] NCDOT STIP I-5870 Traffic Forecast Questionnaire

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

My name is Lee Klieman and my firm, Patriot Transportation Engineering, is in the process of preparing a traffic forecast for NCDOT STIP Project No. I-5870, which would modify the interchange of I-440 at Ridge Rd to convert it to a full movement with a connection to Crabtree Valley Ave in Wake County. During the development of the forecast we utilize numerous resources, one of which is to gain a better understanding of the study area through discussing the project

Lee Klieman

From: Walston, Scott W (TPB) <swalston@ncdot.gov>
Sent: Thursday, March 29, 2018 1:24 PM
To: Lee Klieman
Cc: Eatman, Mark R
Subject: RE: [External] NCDOT STIP I-5870 Traffic Forecast Questionnaire

Hi Lee – I received your message. On 3/21, I forwarded this to Mark Eatman, so hopefully he has responded – if not, you can follow up with him.

Scott

From: Lee Klieman [mailto:Lee@pt-engineering.net]
Sent: Tuesday, March 20, 2018 12:10 PM
To: chris.lukasina@campo-nc.us; alex.rickard@campo-nc.us; tim.gardiner@wakegov.com; eric.lamb@raleighnc.gov; Keilson, David P <dpkeilson@ncdot.gov>; Sandor, John E <jesandor@ncdot.gov>; Wheeler, Millard S <mwheeler@ncdot.gov>; Tharrington, Emmette B <btharrington@ncdot.gov>; Desai, Rupal P <rpdesai@ncdot.gov>; Walston, Scott W (TPB) <swalston@ncdot.gov>
Cc: Peter Trencansky <peter@pt-engineering.net>
Subject: [External] NCDOT STIP I-5870 Traffic Forecast Questionnaire

CAUTION: External email. Do not click links or open attachments unless verified. Send all suspicious email as an attachment to [Report Spam](#).

My name is Lee Klieman and my firm, Patriot Transportation Engineering, is in the process of preparing a traffic forecast for NCDOT STIP Project No. I-5870, which would modify the interchange of I-440 at Ridge Rd to convert it to a full movement with a connection to Crabtree Valley Ave in Wake County. During the development of the forecast we utilize numerous resources, one of which is to gain a better understanding of the study area through discussing the project with local planners and engineers. I have attached a brief questionnaire that will help us gain a better understanding of the study area as we prepare the forecast. Besides local knowledge (represented by responses to the questionnaire), several other data sources will be consulted in shaping the forecast, so that engineering judgment will sometimes be necessary in determining the traffic forecast submitted to NCDOT.

If you would please review the attached questionnaire, we would greatly appreciate your time in answering these questions. You may answer the questions in text format in the attached file (or simply within an email) and return them to me at: lee@pt-engineering.net. If you would rather discuss the questions over the phone, I will be following up with a phone call next week. Thank you in advance for your time and please let me know if you have any questions.

Lee Klieman, P.E., PTOE

Patriot Transportation Engineering, PLLC

<u>Mailing Address</u>	<u>Physical Address</u>
PO Box 31452	3008 Anderson Drive
Raleigh, NC 27622	Suite 220
	Raleigh, NC 27609

lee@pt-engineering.net
Office: 919.336.9342

APPENDIX C:
TRAFFIC FORECAST TABLES

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data ⁽²⁾		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
I-440 - West of Lake Boone Trail	107,000	109,000	107,000	108,000	114,000	112,000	124,000	121,200	127,200 (4)		122,000
I-440 - Lake Boone Trail to Ridge Rd	110,000	112,000	110,000	112,000	118,000	118,000	128,000	126,600	134,000 (4) 134,200 (4)		131,000
I-440 - Ridge Rd to US 70 (Glenwood Avenue)									143,500 (4) 142,000 (4)		140,000
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	128,000	132,000	135,000	134,000	138,000	138,000	148,000	147,600	163,000 (4) 162,500 (4)		156,800
I-440 - East of SR 1005 (Six Forks Road)	116,000	122,000	126,000	125,000	127,000	128,000	137,000	137,200	148,100 (4)		141,300
Lake Boone Trail - North of Wycliff Rd		17,000		17,000		18,000		18,300	34,500 (3)		34,400
Lake Boone Trail - Wycliff Rd to Myron Drive									36,700 (3) 36,700 (3)		36,000
Lake Boone Trail - Myron Drive to I-440		17,000		34,000		33,000		35,200	40,200 (3) 40,800 (3)		39,400
Lake Boone Trail - I-440 to Ridge Road		11,000		9,100		9,000		9,500	12,200 (3) 11,900 (3)		12,200
Lake Boone Trail - South of Ridge Road		7,700		7,600		7,400		7,500	9,300 (3)		9,500
Wycliff Rd - East of Lake Boone Trail									13,900 (3)		14,000
Myron Drive - West of Lake Boone Trail									2,100 (3)		2,200
Shopping Center Driveway - East of Lake Boone Trail									4,400 (3)		4,400
Ridge Rd - I-440 to Varnell Ave									10,300 (3) 9,700 (3)		10,000
Ridge Rd - Varnell Ave to Manuel Street									9,600 (3) 9,100 (3)		9,800
Ridge Road - Manuel Street to Glen Eden Road									9,300 (3) 10,600 (3)		9,800
Ridge Road - Glen Eden Road to Lake Boone Trail									10,900 (3) 10,300 (3)		10,100

Notes:

(1) Data extrapolated to 2017 based on linear regression of 2006-2016 data

(2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3

(3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.

(4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.

(5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data(2)		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
Ridge Road - West of Lake Boone Trail				8,000		8,700		9,800	9,200 (3)		9,200
Varnell Ave - East of Ridge Rd									800 (3)		800
Manuel Street - East of Ridge Road									600 (3)		600
Glen Eden Road - West of Ridge Road				7,800		8,700		9,000	12,500 (3)		12,500
Glen Eden Road - East of Ridge Road		2,900		5,700		7,500		7,800	9,200 (3)		8,800
BB&T Driveway - North of SR 3009 (Creedmoor Road)									500 (3)		500
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road									4,100 (3) 4,200 (3)		4,100
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)									6,600 (3) 6,600 (3)		6,500
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)									5,500 (3) 5,500 (3)	5,600 (5)	5,500
Summit Park Lane - South of SR 1670 (Blue Ridge Road)									1,800 (3)		1,800
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive		35,000		34,000		35,000		34,100	47,800 (3)		49,200
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive									48,200 (3) 49,400 (3)		49,600
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)		38,000		36,000		38,000		37,100	49,600 (3) 49,100 (3)		49,800
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall									64,400 (3) 64,500 (3)		63,200
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway		46,000		49,000		50,000		49,600	67,500 (3) 68,400 (3)	70,300 (5)	66,100

Notes:

- (1) Data extrapolated to 2017 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.
- (5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data(2)		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)									68,700 (3) 68,700 (3)		66,500
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place									95,900 (3) 97,200 (3)		92,200
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive									99,800 (3) 98,900 (3)		95,000
US 70 (Glenwood Avenue) - Arrow Drive to I-440		69,000		77,000				79,800	99,200 (3) 100,900 (3)		95,600
US 70 (Glenwood Avenue) - I-440 to National Drive									39,400 (3) 39,400 (3)		39,000
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive									38,200 (3) 37,500 (3)		37,700
US 70 (Glenwood Avenue) - South of Womans Club Drive									36,200 (3)		36,200
SR 3009 (Creedmoor Road) - West of Riverwood Circle		20,000		22,000		22,000		23,200	26,800 (3)		26,800
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave									27,000 (3) 27,000 (3)		27,000
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway									28,100 (3) 29,000 (3)		28,200
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)		22,000				23,000		24,800	31,100 (3) 29,500 (3)		30,400
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)		30,000		29,000		29,000		28,700	39,400 (3)		39,000

Notes:

- (1) Data extrapolated to 2017 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.
- (5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data(2)		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)									10,500 (3)		11,400
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive		8,400		7,100		7,800		7,600	9,300 (3) 9,800 (3)		10,600
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane									10,400 (3) 10,400 (3)		11,200
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane									14,500 (3)	14,200 (5)	15,300
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway									12,300 (3)		12,300
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)		19,000		18,000		18,000		19,400	19,000 (3) 20,300 (3)		19,000
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive		28,000		28,000		29,000		27,900	32,700 (3) 25,600 (3)		30,700
SR 1820 (Lead Mine Road) - East of North Hills Drive		20,000		21,000		22,000		22,300	20,800 (3)		24,700
Fairhill Drive - West of US 70 (Glenwood Avenue)									2,500 (3)		2,600
Rembert Drive - East of US 70 (Glenwood Avenue)									1,200 (3)		1,200
Morehead Drive - East of US 70 (Glenwood Avenue)									600 (3)		600
Riverwood Circle - South of SR 3009 (Creedmoor Road)									1,000 (3)		1,000
Commercial Driveway - North of SR 3009 (Creedmoor Road)									400 (3)		400
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)									6,200 (3)		6,200
Crabtree Apartments Driveway - North of Edwards Mill Road									2,800 (3)		2,800

Notes:

- (1) Data extrapolated to 2017 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.
- (5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data(2)		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
Edwards Mill Road - West of Crabtree Apartments Driveway									3,300 (3)		3,200
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue									4,400 (3) 4,400 (3)		4,400
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)									6,600 (3)		6,300
Marriot Drive - East of US 70 (Glenwood Avenue)									2,700 (3)		2,600
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)		1,100		1,300		1,400		900	2,000 (3)		2,400
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue									2,300 (3)		2,400
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue									3,300 (3)		3,400
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)									2,600 (3)	2,800 (5)	2,600
Arinto Drive - North of SR 1670 (Blue Ridge Road)									700 (3)		800
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)									9,200 (3)		9,300
North Hills Drive - North of SR 1820 (Lead Mine Road)									700 (3)		800
North Hills Drive - South of SR 1820 (Lead Mine Road)		7,000		7,000		7,100		7,000	6,300 (3)		7,600
Crabtree View Place - West of US 70 (Glenwood Avenue)									3,400 (3)		3,400
Arrow Drive - West of US 70 (Glenwood Avenue)									1,200 (3)		1,200
Varnell Drive - West of US 70 (Glenwood Avenue)									1,300 (3)		1,300
National Drive - East of US 70 (Glenwood Avenue)									1,600 (3)		1,600

Notes:

- (1) Data extrapolated to 2017 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.
- (5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C1: 2017 Base Year No-Build Traffic Volumes

Forecast Location	NCDOT Historic Count Data							AADT Extrapolated to 2017 (1)	Project Specific Count Data(2)		2017 No- Build Traffic Forecast
	2010	2011	2012	2013	2014	2015	2016		TMC	Mainline	
Parking Garage Entrance - West of US 70 (Glenwood Avenue)									700 (3)		700
Womans Club Drive - East of US 70 (Glenwood Avenue)									3,700 (3)		3,600
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street		39,000		43,000		45,000		46,800	50,500 (3)		50,200
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St		42,000		48,000		53,000		51,400	57,300 (3) 59,300 (3)		56,900
SR 1005 (Six Forks Road) - Front St to I-440									67,000 (3) 67,000 (3)		64,500
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr									38,400 (3) 38,400 (3)		37,200
SR 1005 (Six Forks Road) - South of Ramblewood Dr					27,000			25,900	36,500 (3)		35,200
SR 1005 (Six Forks Road) - North of Barrett Drive									30,300 (3)		31,300
SR 1005 (Six Forks Road) - South of Barrett Drive									31,400 (3)		32,400
Main Street - West of SR 1005 (Six Forks Road)									9,500 (3)		9,500
Dartmouth Road - East of SR 1005 (Six Forks Road)		1,600		1,400		1,400		900	9,800 (3)		9,800
Front St - East of SR 1005 (Six Forks Road)									10,500 (3)		10,800
Ramblewood Dr - West of SR 1005 (Six Forks Road)									5,200 (3)		5,200
Barrett Drive - East of SR 1005 (Six Forks Road)									5,600 (3)		5,500

Notes:

- (1) Data extrapolated to 2017 based on linear regression of 2006-2016 data
- (2) All Project Specific Counts were converted to AADT based on the NCDOT Traffic Survey Unit ATR Seasonal Factors as described in Section 2.3
- (3) 2017 13-hour Turning Movement Count - factored to 24-hour volumes and adjusted to AADT.
- (4) 2017 14-hour Manual Classification Count - factored to 24-hour volumes and adjusted to AADT.
- (5) 2017 Project Specific Mainline Count - Adjusted to AADT.

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
I-440 - West of Lake Boone Trail	4 , 4	U-2719	2 , 1 (2)		3 , 1
I-440 - Lake Boone Trail to Ridge Rd	4 , 4	U-2719	3 , 1 (2) 2 , 1 (2)		3 , 1
I-440 - Ridge Rd to US 70 (Glenwood Avenue)			2 , 1 (2) 2 , 1 (2)		3 , 1
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)			3 , 1 (2) 3 , 1 (2)		3 , 1
I-440 - East of SR 1005 (Six Forks Road)	5 , 4	I-5708	3 , 1 (2)		3 , 1
Lake Boone Trail - North of Wycliff Rd			1 , 1 (1)		2 , 1
Lake Boone Trail - Wycliff Rd to Myron Drive			1 , 1 (1) 1 , 1 (1)		2 , 1
Lake Boone Trail - Myron Drive to I-440	2 , 1	U-2719	1 , 1 (1) 1 , 1 (1)		2 , 1
Lake Boone Trail - I-440 to Ridge Road	2 , 1	U-2719	2 , 1 (1) 2 , 1 (1)		2 , 1
Lake Boone Trail - South of Ridge Road			1 , 1 (1)		2 , 1
Wycliff Rd - East of Lake Boone Trail			1 , 1 (1)		2 , 1
Myron Drive - West of Lake Boone Trail			3 , 0 (1)		3 , 1
Shopping Center Driveway - East of Lake Boone Trail			1 , 1 (1)		2 , 1
Ridge Rd - I-440 to Varnell Ave			1 , 0 (1) 1 , 0 (1)		2 , 1
Ridge Rd - Varnell Ave to Manuel Street			1 , 1 (1) 2 , 1 (1)		2 , 1
Ridge Road - Manuel Street to Glen Eden Road			2 , 1 (1) 2 , 1 (1)		2 , 1
Ridge Road - Glen Eden Road to Lake Boone Trail			2 , 1 (1) 1 , 1 (1)		2 , 1
Ridge Road - West of Lake Boone Trail			2 , 1 (1)		2 , 1
Varnell Ave - East of Ridge Rd			3 , 1 (1)		3 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
Manuel Street - East of Ridge Road			5 , 0 (1)		3 , 1
Glen Eden Road - West of Ridge Road			1 , 1 (1)		2 , 1
Glen Eden Road - East of Ridge Road			2 , 1 (1)		2 , 1
BB&T Driveway - North of SR 3009 (Creedmoor Road)			3 , 0 (1)		3 , 1
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road			4 , 1 (1) 4 , 1 (1)		4 , 1
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)			4 , 1 (1) 4 , 1 (1)		3 , 1
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)			2 , 1 (1) 3 , 1 (1)	(3 , 1) (3)	3 , 1
Summit Park Lane - South of SR 1670 (Blue Ridge Road)			1 , 1 (1)		2 , 1
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive			4 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive			4 , 1 (1) 3 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)			3 , 1 (1) 3 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall			3 , 1 (1) 3 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway			3 , 1 (1) 3 , 1 (1)	(3 , 1) (3)	3 , 1
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)			3 , 1 (1) 3 , 1 (1)		3 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place			3 , 1 (1) 3 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive			3 , 1 (1) 3 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - Arrow Drive to I-440			3 , 1 (1) 2 , 1 (1)		3 , 1
US 70 (Glenwood Avenue) - I-440 to National Drive			2 , 1 (1) 2 , 1 (1)		2 , 1
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive			2 , 1 (1) 2 , 1 (1)		2 , 1
US 70 (Glenwood Avenue) - South of Womans Club Drive			2 , 1 (1)		2 , 1
SR 3009 (Creedmoor Road) - West of Riverwood Circle			1 , 1 (1)		2 , 1
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave			1 , 1 (1) 1 , 1 (1)		2 , 1
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway			2 , 1 (1) 2 , 1 (1)		2 , 1
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			2 , 1 (1) 2 , 1 (1)		2 , 1
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)			1 , 1 (1)		2 , 1
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive			1 , 1 (1) 1 , 1 (1)		2 , 1
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane			1 , 1 (1) 1 , 1 (1)		2 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane			2 , 1 (1)	(2 , 1) (3)	2 , 1
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway			2 , 1 (1)		2 , 1
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			2 , 1 (1) 2 , 1 (1)		2 , 1
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive			2 , 1 (1) 2 , 1 (1)		2 , 1
SR 1820 (Lead Mine Road) - East of North Hills Drive			2 , 1 (1)		2 , 1
Fairhill Drive - West of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
Rembert Drive - East of US 70 (Glenwood Avenue)			3 , 0 (1)		3 , 1
Morehead Drive - East of US 70 (Glenwood Avenue)			4 , 0 (1)		3 , 1
Riverwood Circle - South of SR 3009 (Creedmoor Road)			3 , 1 (1)		3 , 1
Commercial Driveway - North of SR 3009 (Creedmoor Road)			1 , 0 (1)		2 , 1
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)			1 , 1 (1)		2 , 1
Crabtree Apartments Driveway - North of Edwards Mill Road			1 , 1 (1)		2 , 1
Edwards Mill Road - West of Crabtree Apartments Driveway			2 , 1 (1)		2 , 1
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue			2 , 1 (1) 2 , 1 (1)		2 , 1
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)			1 , 1 (1)		2 , 1
Marriot Drive - East of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)			3 , 1 (1)		3 , 1
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue			4 , 1 (1)		3 , 1
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue			6 , 1 (1)		6 , 1
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)			2 , 1 (1)	(2 , 1) (3)	2 , 1
Arinto Drive - North of SR 1670 (Blue Ridge Road)			2 , 0 (1)		2 , 1
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)			3 , 1 (1)		3 , 1
North Hills Drive - North of SR 1820 (Lead Mine Road)			5 , 0 (1)		3 , 1
North Hills Drive - South of SR 1820 (Lead Mine Road)			2 , 1 (1)		2 , 1
Crabtree View Place - West of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
Arrow Drive - West of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
National Drive - West of US 70 (Glenwood Avenue)			3 , 0 (1)		3 , 1
National Drive - East of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
Parking Garage Entrance - West of US 70 (Glenwood Avenue)			1 , 0 (1)		2 , 1
Womans Club Drive - East of US 70 (Glenwood Avenue)			2 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street			1 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St			1 , 1 (1)		2 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C2: 2017 Base Year No-Build Design Data – Truck Percentages

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Truck Percentage	STIP Project	TMC	Mainline	
SR 1005 (Six Forks Road) - Front St to I-440			1 , 1 (1) 1 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	3 , 1	I-5708	2 , 1 (1) 2 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - South of Ramblewood Dr			1 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - North of Barrett Drive			1 , 1 (1)		2 , 1
SR 1005 (Six Forks Road) - South of Barrett Drive			1 , 1 (1)		2 , 1
Main Street - West of SR 1005 (Six Forks Road)			1 , 1 (1)		2 , 1
Dartmouth Road - East of SR 1005 (Six Forks Road)			1 , 1 (1)		2 , 1
Front St - East of SR 1005 (Six Forks Road)			1 , 1 (1)		2 , 1
Ramblewood Dr - West of SR 1005 (Six Forks Road)			2 , 1 (1)		2 , 1
Barrett Drive - East of SR 1005 (Six Forks Road)			1 , 1 (1)		2 , 1

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
I-440 - West of Lake Boone Trail	55 WB	U-2719	50 WB (2)		55 EB
I-440 - Lake Boone Trail to Ridge Rd	55 WB	U-2719	54 EB (2) 54 EB (2)		55 EB
I-440 - Ridge Rd to US 70 (Glenwood Avenue)			53 EB (2) 53 EB (2)		55 EB
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	55	I-5708	52 EB (2) 51 EB (2)		55 EB
I-440 - East of SR 1005 (Six Forks Road)	55	I-5708	53 EB (2)		55 EB
Lake Boone Trail - North of Wycliff Rd			65 SB (1)		65 SB
Lake Boone Trail - Wycliff Rd to Myron Drive			71 SB (1) 68 SB (1)		70 SB
Lake Boone Trail - Myron Drive to I-440	55 NB	U-2719	66 SB (1) 65 SB (1)		70 SB
Lake Boone Trail - I-440 to Ridge Road	55 NB	U-2719	52 SB (1) 51 NB (1)		55 SB
Lake Boone Trail - South of Ridge Road			51 NB (1)		55 SB
Wycliff Rd - East of Lake Boone Trail			69 WB (1)		70 WB
Myron Drive - West of Lake Boone Trail			73 EB (1)		75 EB
Shopping Center Driveway - East of Lake Boone Trail			73 EB (1)		75 EB
Ridge Rd - I-440 to Varnell Ave			52 SB (1) 59 SB (1)		55 SB
Ridge Rd - Varnell Ave to Manuel Street			55 SB (1) 53 SB (1)		55 SB
Ridge Road - Manuel Street to Glen Eden Road			55 SB (1) 55 SB (1)		55 SB
Ridge Road - Glen Eden Road to Lake Boone Trail			59 SB (1) 58 WB (1)		60 SB 60 WB
Ridge Road - West of Lake Boone Trail			60 WB (1)		60 WB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
Varnell Ave - East of Ridge Rd			89 EB (1)		80 EB
Manuel Street - East of Ridge Road			81 WB (1)		75 WB
Glen Eden Road - West of Ridge Road			57 EB (1)		55 EB
Glen Eden Road - East of Ridge Road			53 EB (1)		55 EB
BB&T Driveway - North of SR 3009 (Creedmoor Road)			60 SB (1)		60 SB
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road			58 SB (1) 58 SB (1)		60 SB
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)			63 SB (1) 63 SB (1)		65 SB
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)			61 SB (1) 64 SB (1)	64 SB (3)	65 SB
Summit Park Lane - South of SR 1670 (Blue Ridge Road)			61 SB (1)		60 SB
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive			56 NB (1)		55 NB
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive			56 NB (1) 53 NB (1)		55 NB
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)			53 NB (1) 54 NB (1)		55 NB
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall			54 NB (1) 55 NB (1)		55 NB
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway			55 NB (1) 54 NB (1)	55 NB (3)	55 NB
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)			53 NB (1) 54 NB (1)		55 NB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place			57 NB (1) 57 NB (1)		55 NB
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive			55 NB (1) 55 NB (1)		55 NB
US 70 (Glenwood Avenue) - Arrow Drive to I-440			55 NB (1) 52 NB (1)		55 NB
US 70 (Glenwood Avenue) - I-440 to National Drive			56 NB (1) 61 NB (1)		60 NB
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive			59 NB (1) 60 NB (1)		60 NB
US 70 (Glenwood Avenue) - South of Womans Club Drive			56 NB (1)		60 NB
SR 3009 (Creedmoor Road) - West of Riverwood Circle			64 EB (1)		65 EB
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave			63 EB (1) 63 EB (1)		65 EB
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway			62 EB (1) 62 EB (1)		65 EB
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			62 EB (1) 65 EB (1)		65 EB
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)			63 EB (1)		65 EB
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)			57 EB (1)		55 EB
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive			56 EB (1) 53 EB (1)		55 EB
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane			53 EB (1) 53 EB (1)		55 EB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane			56 EB (1)	56 EB (3)	55 EB
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway			52 EB (1)		55 EB
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			52 EB (1) 54 WB (1)		55 EB
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive			58 EB (1) 57 EB (1)		55 EB
SR 1820 (Lead Mine Road) - East of North Hills Drive			55 EB (1)		55 EB
Fairhill Drive - West of US 70 (Glenwood Avenue)			62 EB (1)		60 EB
Rembert Drive - East of US 70 (Glenwood Avenue)			51 EB (1)		55 EB
Morehead Drive - East of US 70 (Glenwood Avenue)			62 EB (1)		60 EB
Riverwood Circle - South of SR 3009 (Creedmoor Road)			72 SB (1)		70 SB
Commercial Driveway - North of SR 3009 (Creedmoor Road)			86 SB (1)		75 SB
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)			50 SB (1)		55 SB
Crabtree Apartments Driveway - North of Edwards Mill Road			52 SB (1)		55 SB
Edwards Mill Road - West of Crabtree Apartments Driveway			65 EB (1)		65 EB
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue			63 EB (1) 64 EB (1)		65 EB
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)			60 WB (1)		60 WB
Marriot Drive - East of US 70 (Glenwood Avenue)			64 WB (1)		65 WB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)			56 NB (1)		55 NB
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue			52 WB (1)		55 WB
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue			55 EB (1)		55 EB
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)			60 EB (1)	55 EB (3)	60 EB
Arinto Drive - North of SR 1670 (Blue Ridge Road)			53 SB (1)		55 SB
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)			52 SB (1)		55 SB
North Hills Drive - North of SR 1820 (Lead Mine Road)			54 SB (1)		55 SB
North Hills Drive - South of SR 1820 (Lead Mine Road)			62 SB (1)		60 SB
Crabtree View Place - West of US 70 (Glenwood Avenue)			91 EB (1)		75 EB
Arrow Drive - West of US 70 (Glenwood Avenue)			66 EB (1)		75 EB
National Drive - West of US 70 (Glenwood Avenue)			53 WB (1)		55 WB
National Drive - East of US 70 (Glenwood Avenue)			94 WB (1)		75 WB
Parking Garage Entrance - West of US 70 (Glenwood Avenue)			93 EB (1)		75 EB
Womans Club Drive - East of US 70 (Glenwood Avenue)			82 WB (1)		75 WB
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street			52 NB (1)		55 NB
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St			53 NB (1) 51 SB (1)		50 NB/SB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C3: 2017 Base Year No-Build Design Data – Directional Distribution

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Directional Distribution	STIP Project	TMC	Mainline	
SR 1005 (Six Forks Road) - Front St to I-440			53 SB (1) 51 SB (1)		50 NB/SB
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	60	I-5708	54 NB (1) 51 NB (1)		55 NB
SR 1005 (Six Forks Road) - South of Ramblewood Dr			53 NB (1)		55 NB
SR 1005 (Six Forks Road) - North of Barrett Drive			51 NB (1)		55 NB
SR 1005 (Six Forks Road) - South of Barrett Drive			56 SB (1)		55 SB
Main Street - West of SR 1005 (Six Forks Road)			75 WB (1)		75 WB
Dartmouth Road - East of SR 1005 (Six Forks Road)			66 WB (1)		65 WB
Front St - East of SR 1005 (Six Forks Road)			61 WB (1)		60 WB
Ramblewood Dr - West of SR 1005 (Six Forks Road)			62 WB (1)		60 WB
Barrett Drive - East of SR 1005 (Six Forks Road)			81 WB (1)		75 WB

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
I-440 - West of Lake Boone Trail	10	U-2719	8 (2)		8
I-440 - Lake Boone Trail to Ridge Rd	10	U-2719	8 (2) 8 (2)		8
I-440 - Ridge Rd to US 70 (Glenwood Avenue)			8 (2) 8 (2)		8
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	11	I-5708	8 (2) 8 (2)		8
I-440 - East of SR 1005 (Six Forks Road)	10	I-5708	8 (2)		8
Lake Boone Trail - North of Wycliff Rd			7 (1)		7
Lake Boone Trail - Wycliff Rd to Myron Drive			7 (1) 7 (1)		7
Lake Boone Trail - Myron Drive to I-440	11	U-2719	7 (1) 7 (1)		7
Lake Boone Trail - I-440 to Ridge Road	11	U-2719	7 (1) 12 (1)		10
Lake Boone Trail - South of Ridge Road			12 (1)		10
Wycliff Rd - East of Lake Boone Trail			7 (1)		7
Myron Drive - West of Lake Boone Trail			8 (1)		8
Shopping Center Driveway - East of Lake Boone Trail			5 (1)		6
Ridge Rd - I-440 to Varnell Ave			7 (1) 13 (1)		13
Ridge Rd - Varnell Ave to Manuel Street			13 (1) 13 (1)		13
Ridge Road - Manuel Street to Glen Eden Road			14 (1) 13 (1)		13
Ridge Road - Glen Eden Road to Lake Boone Trail			13 (1) 13 (1)		13
Ridge Road - West of Lake Boone Trail			12 (1)		12

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
Varnell Ave - East of Ridge Rd			18 (1)		15
Manuel Street - East of Ridge Road			19 (1)		15
Glen Eden Road - West of Ridge Road			11 (1)		11
Glen Eden Road - East of Ridge Road			11 (1)		11
BB&T Driveway - North of SR 3009 (Creedmoor Road)			6 (1)		6
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road			8 (1) 8 (1)		8
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)			9 (1) 9 (1)		9
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)			9 (1) 9 (1)	9 (3)	9
Summit Park Lane - South of SR 1670 (Blue Ridge Road)			11 (1)		11
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive			9 (1)		9
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive			9 (1) 9 (1)		9
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)			9 (1) 9 (1)		9
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall			8 (1) 8 (1)		8
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway			8 (1) 8 (1)	8 (3)	8
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)			8 (1) 8 (1)		8

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place			8 (1) 8 (1)		8
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive			8 (1) 8 (1)		8
US 70 (Glenwood Avenue) - Arrow Drive to I-440			8 (1) 7 (1)		8
US 70 (Glenwood Avenue) - I-440 to National Drive			7 (1) 9 (1)		9
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive			9 (1) 9 (1)		9
US 70 (Glenwood Avenue) - South of Womans Club Drive			9 (1)		9
SR 3009 (Creedmoor Road) - West of Riverwood Circle			9 (1)		9
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave			9 (1) 9 (1)		9
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway			9 (1) 9 (1)		9
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			9 (1) 9 (1)		9
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)			8 (1)		8
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)			9 (1)		9
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive			9 (1) 9 (1)		9
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane			9 (1) 9 (1)		9

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane			8 (1)	8 (3)	8
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway			8 (1)		8
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)			8 (1) 8 (1)		8
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive			8 (1) 9 (1)		8
SR 1820 (Lead Mine Road) - East of North Hills Drive			9 (1)		8
Fairhill Drive - West of US 70 (Glenwood Avenue)			8 (1)		8
Rembert Drive - East of US 70 (Glenwood Avenue)			10 (1)		10
Morehead Drive - East of US 70 (Glenwood Avenue)			8 (1)		8
Riverwood Circle - South of SR 3009 (Creedmoor Road)			8 (1)		8
Commercial Driveway - North of SR 3009 (Creedmoor Road)			10 (1)		10
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)			8 (1)		8
Crabtree Apartments Driveway - North of Edwards Mill Road			9 (1)		9
Edwards Mill Road - West of Crabtree Apartments Driveway			9 (1)		9
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue			9 (1) 9 (1)		9
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)			8 (1)		8
Marriot Drive - East of US 70 (Glenwood Avenue)			10 (1)		10

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)			10 (1)		10
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue			10 (1)		10
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue			11 (1)		11
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)			8 (1)	9 (3)	8
Arinto Drive - North of SR 1670 (Blue Ridge Road)			9 (1)		9
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)			8 (1)		8
North Hills Drive - North of SR 1820 (Lead Mine Road)			12 (1)		12
North Hills Drive - South of SR 1820 (Lead Mine Road)			9 (1)		9
Crabtree View Place - West of US 70 (Glenwood Avenue)			7 (1)		7
Arrow Drive - West of US 70 (Glenwood Avenue)			9 (1)		9
National Drive - West of US 70 (Glenwood Avenue)			7 (1)		7
National Drive - East of US 70 (Glenwood Avenue)			12 (1)		12
Parking Garage Entrance - West of US 70 (Glenwood Avenue)			9 (1)		9
Womans Club Drive - East of US 70 (Glenwood Avenue)			8 (1)		8
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street			7 (1)		7
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St			7 (1) 7 (1)		7

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C4: 2017 Base Year No-Build Design Data – Peak Hour Factor

Forecast Location	Previous Forecast		Project Specific Count Data		Selected 2017 BY NB Value
	Peak Hour Factor	STIP Project	TMC	Mainline	
SR 1005 (Six Forks Road) - Front St to I-440			8 (1) 7 (1)		7
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	11	I-5708	7 (1) 7 (1)		8
SR 1005 (Six Forks Road) - South of Ramblewood Dr			7 (1)		8
SR 1005 (Six Forks Road) - North of Barrett Drive			8 (1)		8
SR 1005 (Six Forks Road) - South of Barrett Drive			8 (1)		8
Main Street - West of SR 1005 (Six Forks Road)			8 (1)		8
Dartmouth Road - East of SR 1005 (Six Forks Road)			9 (1)		9
Front St - East of SR 1005 (Six Forks Road)			10 (1)		10
Ramblewood Dr - West of SR 1005 (Six Forks Road)			7 (1)		7
Barrett Drive - East of SR 1005 (Six Forks Road)			9 (1)		9

Notes:

- (1) 2017 13-hour Turning Movement Count
- (2) 2017 14-hour Manual Classification Count
- (3) 2017 Volume, Speed, Class Mainline Count

Table C5: Model Validation

Forecast Location	Model 2013		2017 No-Build		FY No-Build Volumes	
	Model Volume	AADT	Interpolated Model ⁽¹⁾	Forecast Volume	2045 Model	2045 Forecast
I-440 - West of Lake Boone Trail	121,665	108,000	128,500	122,000	176,578	165,800
I-440 - Lake Boone Trail to Ridge Rd	117,946	112,000	124,400	131,000	169,408	178,000
I-440 - Ridge Rd to US 70 (Glenwood Ave)	121,105		127,900	140,000	175,519	189,000
I-440 - US 70 (Glenwood Ave) to SR 1005 (Six Forks Rd)	131,248	134,000	140,200	156,800	202,490	219,000
I-440 - East of SR 1005 (Six Forks Rd)	129,779	125,000	139,100	141,300	204,037	205,700
Lake Boone Trail - North of Wycliff Rd	19,830	17,000	20,900	34,400	28,218	43,200
Lake Boone Trail - Wycliff Rd to Myron Dr	23,577		25,400	36,000	38,218	45,400
Lake Boone Trail - Myron Dr to I-440	29,063	34,000	30,200	39,400	38,218	49,200
Lake Boone Trail - South of I-440	12,558	9,100	15,000	12,200	31,838	24,400
Lake Boone Trail - North of Ridge Rd	10,538		12,800	12,200	28,244	24,400
Lake Boone Trail - South of Ridge Rd	8,487	7,600	10,800	9,500	26,688	22,300
Wycliff Rd - East of Lake Boone Trail	4,505		5,000	14,000	8,402	19,200
Myron Dr - West of Lake Boone Trail	<i>5,844</i>		<i>5,900</i>	2,200	<i>6,688</i>	2,600
Ridge Rd - I-440 to Varnell Ave	10,694		11,100	10,000	14,207	13,000
Ridge Rd - South of Varnell Ave	5,333		5,700	9,800	8,071	12,700
Ridge Rd - North of Manuel St	10,694		11,100	9,800	14,207	12,700
Ridge Rd - South of Manuel St	5,293		5,500	9,800	6,896	12,700
Ridge Rd - South of Glen Eden Rd	2,427		2,600	10,100	4,125	13,700
Ridge Rd - East of Lake Boone Trail	3,953		4,300	10,100	6,780	13,700
Ridge Rd - West of Lake Boone Trail	196	8,000	300	9,200	1,337	12,200
Manuel St - East of Ridge Rd	<i>5,398</i>		<i>5,600</i>	600	<i>7,355</i>	800
Glen Eden Rd - West of Ridge Rd	7,748	7,800	8,800	12,500	16,329	20,600
Glen Eden Rd - East of Ridge Rd	7,108	5,700	8,000	8,800	14,170	15,200
Crabtree Valley Ave - SR 3009 (Creedmoor Rd) to Edwards Mill Rd	4,498		4,600	4,100	4,939	7,100
Crabtree Valley Avenue - Edwards Mill Rd to Crabtree Valley Mall Dwy/SR 1669 (Homewood Banks Dr)	4,498		4,600	6,500	4,939	10,300
Crabtree Valley Avenue - Crabtree Valley Mall Dwy/SR 1669 (Homewood Banks Dr) to SR 1670 (Blue Ridge Rd)	110		300	5,500	1,251	9,100
US 70 (Glenwood Ave) - North of Rembert Dr/Fairhill Dr	34,453	34,000	35,600	49,200	43,957	58,000
US 70 (Glenwood Ave) - South of Rembert Dr/Fairhill Dr	35,546		36,900	49,600	46,132	58,200
US 70 (Glenwood Ave) - North of Morehead Dr	39,105		40,000	49,600	46,132	58,200

Notes: (1) Interpolated volume between 2013 and 2045 model data

Traffic values shown in *grey italics* are taken from representative centroid connectors

Table C5: Model Validation

Forecast Location	Model 2013		2017 No-Build		FY No-Build Volumes	
	Model Volume	AADT	Interpolated Model ⁽¹⁾	Forecast Volume	2045 Model	2045 Forecast
US 70 (Glenwood Ave) - Morehead Dr to NC 50 (Creedmoor Rd)	40,343	36,000	41,300	49,800	48,245	58,400
US 70 (Glenwood Ave) - NC 50 (Creedmoor Rd) to Marriot Dr/Crabtree Valley Mall	70,319		72,000	63,200	83,813	74,800
US 70 (Glenwood Ave) - Marriot Dr/Crabtree Valley Mall to Crabtree Valley Mall Dwy	70,215	49,000	72,300	66,100	86,865	78,000
US 70 (Glenwood Ave) - Crabtree Valley Mall Dwy to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	70,215		72,300	66,500	86,865	78,400
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place	101,798		104,400	92,200	122,568	108,200
US 70 (Glenwood Ave) - South of Crabtree View Place	101,798		104,400	95,000	122,568	112,400
US 70 (Glenwood Ave) - North of I-440	102,494	77,000	105,000	95,600	122,567	113,000
US 70 (Glenwood Ave) - I-440 to National Dr	30,863		33,600	39,000	52,390	60,000
US 70 (Glenwood Ave) - National Dr to Womans Club Dr	30,863		33,600	37,700	52,390	58,600
US 70 (Glenwood Ave) - South of Womans Club Dr	30,863		33,600	36,200	52,390	56,400
SR 3009 (Creedmoor Rd) - West of Riverwood Circle	24,526	22,000	25,600	26,800	33,428	35,600
SR 3009 (Creedmoor Rd) - Riverwood Circle to BB&T Dwy/Crabtree Valley Ave	24,526		25,600	27,000	33,428	35,800
SR 3009 (Creedmoor Rd) - BB&T Dwy/Crabtree Valley Ave to Crabtree Valley Mall Dwy	20,155		21,400	28,200	30,260	38,200
SR 3009 (Creedmoor Rd) - Crabtree Valley Mall Dwy to US 70 (Glenwood Ave)	21,400		22,800	30,400	32,426	40,400
NC 50 (Creedmoor Rd) - East of US 70 (Glenwood Ave)	41,717	29,000	43,300	39,000	54,558	52,000
SR 1670 (Blue Ridge Rd) - East of SR 1669 (Homewood Banks Dr)	5,120	7,100	6,300	10,600	14,592	22,000
SR 1670 (Blue Ridge Rd) - SR 1669 (Homewood Banks Dr) to Arinto Dr	5,120		6,300	10,600	14,592	22,000
SR 1670 (Blue Ridge Rd) - Arinto Dr to Crabtree Valley Ave/Summit Park Ln	6,424		7,700	11,200	16,336	22,600
SR 1670 (Blue Ridge Rd) - East of Crabtree Valley Ave/Summit Park Ln	6,313		7,400	15,300	15,088	25,100
SR 1670 (Blue Ridge Rd) - West of Crabtree Valley Mall Dwy	6,313		7,400	12,300	15,088	21,000
SR 1670 (Blue Ridge Rd) - Crabtree Valley Mall Dwy to US 70 (Glenwood Ave)	24,293	18,000	24,700	19,000	27,921	28,200
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Ave) to North Hills Dr	30,962	28,000	32,500	30,700	43,634	41,800
SR 1820 (Lead Mine Rd) - East of North Hills Dr	25,093	21,000	26,400	24,700	35,273	33,600
Rembert Dr - East of US 70 (Glenwood Ave)	<i>2,106</i>		<i>2,300</i>	1,200	<i>3,301</i>	1,800

Notes: (1) Interpolated volume between 2013 and 2045 model data

Traffic values shown in *grey italics* are taken from representative centroid connectors

Table C5: Model Validation

Forecast Location	Model 2013		2017 No-Build		FY No-Build Volumes	
	Model Volume	AADT	Interpolated Model ⁽¹⁾	Forecast Volume	2045 Model	2045 Forecast
Morehead Dr - East of US 70 (Glenwood Ave)	2,440		2,700	600	4,258	800
Commercial Dwy - North of SR 3009 (Creedmoor Rd)	1,523		1,800	400	3,454	600
Crabtree Valley Mall Dwy - South of SR 3009 (Creedmoor Rd)	429		400	6,200	493	6,800
Crabtree Valley Mall - West of US 70 (Glenwood Ave)	26,518		26,800	6,300	28,816	6,800
Marriot Dr - East of US 70 (Glenwood Ave)	3,566		3,600	2,600	3,707	3,000
Crabtree Valley Mall Dwy - East of Crabtree Valley Ave	4,388		4,400	3,400	4,335	3,800
Crabtree Valley Mall Dwy - North of SR 1670 (Blue Ridge Rd)	22,198		22,300	9,300	22,659	10,200
North Hills Dr - South of SR 1820 (Lead Mine Rd)	7,074	7,000	7,400	7,600	9,690	10,000
Arrow Dr - West of US 70 (Glenwood Ave)	787			1,200		1,600
SR 1005 (Six Forks Rd) - North of Dartmouth Rd/Main St	58,194	43,000	61,300	50,200	82,966	68,300
SR 1005 (Six Forks Rd) - Dartmouth Rd/Main St to Front St	62,711	48,000	65,800	56,900	87,261	79,400
SR 1005 (Six Forks Rd) - Front St to I-440	66,066		70,800	64,500	104,264	90,100
SR 1005 (Six Forks Rd) - I-440 to Ramblewood Dr	18,455		22,400	37,200	49,780	63,000
SR 1005 (Six Forks Rd) - South of Ramblewood Dr	18,455		19,500	35,200	26,761	60,200
SR 1005 (Six Forks Rd) - North of Barrett Dr	18,455		19,500	31,300	26,761	53,000
SR 1005 (Six Forks Rd) - South of Barrett Dr	11,420		14,500	32,400	36,291	55,000
Dartmouth Rd - East of SR 1005 (Six Forks Rd)	6,578	1,400	7,100	9,800	10,946	23,700
Front St - East of SR 1005 (Six Forks Rd)	7,292		10,100	10,800	29,822	15,500
Barrett Dr - East of SR 1005 (Six Forks Rd)	12,453		12,000	5,500	8,843	11,800

Notes: (1) Interpolated volume between 2013 and 2045 model data

Traffic values shown in *grey italics* are taken from representative centroid connectors

Table C6: 2017 Build Alternative 1 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
I-440 - West of Lake Boone Trail	121,665	123,930	1.86%	1.97%	2,265	2,400	122,000	124,400
I-440 - Lake Boone Trail to Ridge Road/Crabtree Valley Avenue	117,946	120,895	2.50%	2.75%	2,949	3,600	131,000	134,600
I-440 - Ridge Rd/Crabtree Valley Ave to US 70 (Glenwood)	121,105	108,721	-10.23%	-4.43% (2)	-12,384	-6,200 (2)	140,000	133,800
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	131,248	132,247	0.76%	0.00%	999	0	156,800	156,800
I-440 - East of SR 1005 (Six Forks Road)	129,779	129,022	-0.58%	0.00%	-757	0	141,300	141,300
Lake Boone Trail - North of Wycliff Rd	19,830	18,681	-5.79%	-3.49%	-1,149	-1,200	34,400	33,200
Lake Boone Trail - Wycliff Rd to Myron Drive	29,063	27,545	-5.22%	-5.56%	-1,518	-2,000	36,000	34,000
Lake Boone Trail - Myron Drive to I-440	29,063	27,545	-5.22%	-5.08%	-1,518	-2,000	39,400	37,400
Lake Boone Trail - I-440 to Ridge Road	12,558	12,894	2.68%	0.00%	336	0	12,200	12,200
Lake Boone Trail - South of Ridge Road	8,487	8,452	-0.41%	0.00%	-35	0	9,500	9,500
Wycliff Rd - East of Lake Boone Trail	4,505	3,744	-16.89%	-5.71%	-761	-800	14,000	13,200
Myron Drive - West of Lake Boone Trail	5,844	5,907	1.08%	0.00%	63	0	2,200	2,200
Myron Drive - East of Lake Boone Trail				0.00%		0	4,400	4,400
Ridge Rd - I-440 to Varnell Ave	10,694	6,898	-35.50%	0.00% (2)	-3,796	0 (2)	10,000	10,000
Ridge Rd - Varnell Ave to Manual Street	5,333	5,706	6.99%	0.00% (2)	373	0 (2)	9,800	9,800
Ridge Road - Manuel Street to Glen Eden Road	5,293	3,892	-26.47%	0.00% (2)	-1,401	0 (2)	9,800	9,800
Ridge Road - Glen Eden Road to Lake Boone Trail	2,427	2,326	-4.16%	0.00%	-101	0	10,100	10,100
Ridge Road - West of Lake Boone Trail	196	199	1.53%	0.00%	3	0	9,200	9,200
Varnell Ave - East of Ridge Rd				0.00%		0	800	800
Manuel Street - East of Ridge Road	5,398	3,004	-44.35%	0.00% (1)	-2,394	0 (1)	600	600
Glen Eden Road - West of Ridge Road	7,748	5,868	-24.26%	0.00%	-1,880	0	12,500	12,500
Glen Eden Road - East of Ridge Road	7,108	7,094	-0.20%	0.00%	-14	0	8,800	8,800
BB&T Driveway - North of SR 3009 (Creedmoor Road)				0.00%		0	500	500
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road	4,498			136.59%		5,600	4,100	9,700
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)	4,498	5,128	14.01%	98.46% (2)	630	6,400 (2)	6,500	12,900
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)	110	10,515	9459.09%	174.55% (2)	10,405	9,600 (2)	5,500	15,100
Crabtree Valley Avenue - SR 1670 (Blue Ridge Road) to I-440	0	40,460	N/A	N/A	40,460	17,900 (2)	0	17,900

Table C6: 2017 Build Alternative 1 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
Summit Park Lane - South of SR 1670 (Blue Ridge Road)				0.00%		0	1,800	1,800
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive	34,453	36,197	5.06%	3.25%	1,744	1,600	49,200	50,800
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive	35,546	37,324	5.00%	3.23%	1,778	1,600	49,600	51,200
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)	40,343	42,300	4.85%	3.21%	1,957	1,600	49,800	51,400
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall	70,319	70,712	0.56%	-2.06% (2)	393	-1,300 (2)	63,200	61,900
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway	70,215	62,165	-11.46%	-3.63% (2)	-8,050	-2,400 (2)	66,100	63,700
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	70,215	62,165	-11.46%	-2.86% (2)	-8,050	-1,900 (2)	66,500	64,600
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place	102,493	77,128	-24.75%	-10.95% (2)	-25,365	-10,100 (2)	92,200	82,100
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive	102,493	77,139	-24.74%	-12.11% (2)	-25,354	-11,500 (2)	95,000	83,500
US 70 (Glenwood Avenue) - Arrow Drive to I-440	102,493	77,139	-24.74%	-12.03% (2)	-25,354	-11,500 (2)	95,600	84,100
US 70 (Glenwood Avenue) - I-440 to National Drive	30,863	33,287	7.85%	5.13%	2,424	2,000	39,000	41,000
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive	30,863	33,287	7.85%	5.31%	2,424	2,000	37,700	39,700
US 70 (Glenwood Avenue) - South of Womans Club Drive	30,863	33,287	7.85%	5.52%	2,424	2,000	36,200	38,200
SR 3009 (Creedmoor Road) - West of Riverwood Circle	24,526	21,878	-10.80%	-8.96%	-2,648	-2,400	26,800	24,400
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave	24,526	17,602	-28.23%	-8.89% (2)	-6,924	-2,400 (2)	27,000	24,600
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway	20,155	17,602	-12.67%	5.67% (2)	-2,553	1,600 (2)	28,200	29,800
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	21,400	19,145	-10.54%	4.93% (2)	-2,255	1,500 (2)	30,400	31,900
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)	41,717	42,121	0.97%	1.03%	404	400	39,000	39,400
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)	5,120	7,089	38.46%	17.54%	1,969	2,000	11,400	13,400
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive	5,120	5,537	8.14%	15.09% (2)	417	1,600 (2)	10,600	12,200
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane	5,120	5,537	8.14%	14.29% (2)	417	1,600 (2)	11,200	12,800

Table C6: 2017 Build Alternative 1 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane	6,313	27,030	328.16%	-22.88% (2)	20,717	-3,500 (2)	15,300	11,800
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway	6,313	27,030	328.16%	-15.45% (2)	20,717	-1,900 (2)	12,300	10,400
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	24,293	22,325	-8.10%	-37.89% (2)	-1,968	-7,200 (2)	19,000	11,800
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive	30,962	30,697	-0.86%	0.00%	-265	0	30,700	30,700
SR 1820 (Lead Mine Road) - East of North Hills Drive	25,093	25,354	1.04%	0.00%	261	0	24,700	24,700
Fairhill Drive - West of US 70 (Glenwood Avenue)				0.00%		0	2,600	2,600
Rembert Drive - East of US 70 (Glenwood Avenue)	2,106	2,118	0.57%	0.00% (1)	12	0 (1)	1,200	1,200
Morehead Drive - East of US 70 (Glenwood Avenue)	2,440	2,476	1.48%	0.00% (1)	36	0 (1)	600	600
Riverwood Circle - South of SR 3009 (Creedmoor Road)		5,128		0.00%		0	1,000	1,000
Commercial Driveway - North of SR 3009 (Creedmoor Road)	1,523	1,523	0.00%	0.00% (1)	0	0 (1)	400	400
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)	429	722	68.30%	-1.61% (2)	293	-100 (2)	6,200	6,100
Crabtree Apartments Driveway - North of Edwards Mill Road				28.57%		800	2,800	3,600
Edwards Mill Road - West of Crabtree Apartments Driveway		5,128		0.00%		0	3,200	3,200
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue		5,128		18.18%		800	4,400	5,200
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)	26,518	16,178	-38.99%	-7.94% (2)	-10,340	-500 (2)	6,300	5,800
Marriot Drive - East of US 70 (Glenwood Avenue)	3,566	4,362	22.32%	0.00% (1)	796	0 (1)	2,600	2,600
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)		1,550		16.67%		400	2,400	2,800
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue		1,550		16.67%		400	2,400	2,800
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue	4,388	11,339	158.41%	105.88% (2)	6,951	3,600 (2)	3,400	7,000
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)				19.23%		500	2,600	3,100
Arinto Drive - North of SR 1670 (Blue Ridge Road)				0.00%		0	800	800
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)	22,198	25,293	13.94%	-44.09% (2)	3,095	-4,100 (2)	9,300	5,200
North Hills Drive - North of SR 1820 (Lead Mine Road)				0.00%		0	800	800
North Hills Drive - South of SR 1820 (Lead Mine Road)	7,074	6,307	-10.84%	0.00%	-767	0	7,600	7,600
Crabtree View Place - West of US 70 (Glenwood Avenue)		401		-41.18%		-1,400	3,400	2,000
Arrow Drive - West of US 70 (Glenwood Avenue)				0.00%		0	1,200	1,200

Table C6: 2017 Build Alternative 1 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
National Drive - West of US 70 (Glenwood Avenue)				0.00%		0	1,300	1,300
National Drive - East of US 70 (Glenwood Avenue)				0.00%		0	1,600	1,600
Womans Club Drive - West of US 70 (Glenwood Avenue)				0.00%		0	700	700
Womans Club Drive - East of US 70 (Glenwood Avenue)				0.00%		0	3,600	3,600
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street	58,194	58,567	0.64%	0.00%	373	0	50,200	50,200
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St	62,711	63,280	0.91%	0.00%	569	0	56,900	56,900
SR 1005 (Six Forks Road) - Front St to I-440	66,066	66,805	1.12%	0.00%	739	0	64,500	64,500
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	18,455	18,813	1.94%	0.00%	358	0	37,200	37,200
SR 1005 (Six Forks Road) - South of Ramblewood Dr	18,455	18,813	1.94%	0.00%	358	0	35,200	35,200
SR 1005 (Six Forks Road) - North of Barrett Drive	18,455	18,813	1.94%	0.00%	358	0	31,300	31,300
SR 1005 (Six Forks Road) - South of Barrett Drive	11,420	11,838	3.66%	0.00%	418	0	32,400	32,400
Main Street - West of SR 1005 (Six Forks Road)				0.00%		0	9,500	9,500
Dartmouth Road - East of SR 1005 (Six Forks Road)	6,578	6,669	1.38%	0.00%	91	0	9,800	9,800
Front St - East of SR 1005 (Six Forks Road)	7,292	7,322	0.41%	0.00% ⁽¹⁾	30	0 ⁽¹⁾	10,800	10,800
Ramblewood Dr - West of SR 1005 (Six Forks Road)				0.00%		0	5,200	5,200
Barrett Drive - East of SR 1005 (Six Forks Road)		12,453		0.00%		0	5,500	5,500

Notes:

(1) Diversion rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

(2) The data from the TRM is not fully representative of the distribution of traffic volumes for this location, please see Section 5.2 of the Traffic Forecast Report for more information

Table C7: 2017 Build Alternative 2 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
I-440 - West of Lake Boone Trail	121,665	122,234	0.47%	0.66%	569	800	122,000	122,800
I-440 - Lake Boone Trail to Ridge Road/Crabtree Valley Avenue	117,946	119,447	1.27%	0.61%	1,501	800	131,000	131,800
I-440 - Ridge Road/Crabtree Valley Avenue to US 70 (Glenwood Avenue)	121,105	100,233	-17.23%	-2.21% (2)	-20,872	-3,100 (2)	140,000	136,900
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	131,248	131,726	0.36%	0.00%	478	0	156,800	156,800
I-440 - East of SR 1005 (Six Forks Road)	129,779	128,843	-0.72%	0.00%	-936	0	141,300	141,300
Lake Boone Trail - North of Wycliff Rd	19,830	19,321	-2.57%	0.00%	-509	0	34,400	34,400
Lake Boone Trail - Wycliff Rd to Myron Drive	29,063	28,338	-2.49%	0.00%	-725	0	36,000	36,000
Lake Boone Trail - Myron Drive to I-440	29,063	28,338	-2.49%	0.00%	-725	0	39,400	39,400
Lake Boone Trail - I-440 to Ridge Road	12,558	12,405	-1.22%	0.00%	-153	0	12,200	12,200
Lake Boone Trail - South of Ridge Road	8,487	8,479	-0.09%	0.00%	-8	0	9,500	9,500
Wycliff Rd - East of Lake Boone Trail	4,505	4,159	-7.68%	0.00%	-346	0	14,000	14,000
Myron Drive - West of Lake Boone Trail	5,844	5,898	0.92%	0.00%	54	0	2,200	2,200
Myron Drive - East of Lake Boone Trail				0.00%		0	4,400	4,400
Ridge Rd - I-440 to Varnell Ave	10,694	9,527	-10.91%	18.00% (2)	-1,167	1,800 (2)	10,000	11,800
Ridge Rd - Varnell Ave to Manuel Street	5,333	9,527	78.64%	18.37% (2)	4,194	1,800 (2)	9,800	11,600
Ridge Road - Manuel Street to Glen Eden Road	5,293	4,349	-17.83%	18.37% (2)	-944	1,800 (2)	9,800	11,600
Ridge Road - Glen Eden Road to Lake Boone Trail	2,427	1,625	-33.04%	0.00% (2)	-802	0 (2)	10,100	10,100
Ridge Road - West of Lake Boone Trail	196	136	-30.61%	0.00%	-60	0	9,200	9,200
Varnell Ave - East of Ridge Rd				0.00%		0	800	800
Manuel Street - East of Ridge Road	5,398	5,176	-4.11%	0.00% (1)	-222	0 (1)	600	600
Glen Eden Road - West of Ridge Road	7,748	6,991	-9.77%	7.20%	-757	900	12,500	13,400
Glen Eden Road - East of Ridge Road	7,108	5,849	-17.71%	10.23%	-1,259	900	8,800	9,700
BB&T Driveway - North of SR 3009 (Creedmoor Road)				0.00%		0	500	500
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road	4,498			165.85% (2)		6,800 (2)	4,100	10,900
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)	4,498	6,104	35.70%	123.08% (2)	1,606	8,000 (2)	6,500	14,500
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)	110	25,157	22770.00%	203.64% (2)	25,047	11,200 (2)	5,500	16,700

Table C7: 2017 Build Alternative 2 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
Crabtree Valley Avenue - SR 1670 (Blue Ridge Road) to Arrow Drive		25,157	N/A	N/A	25,157	16,700	0	16,700
Crabtree Valley Avenue - Arrow Drive to I-440		25,157	N/A	N/A	25,157	17,100	0	17,100
Crabtree Valley Avenue - I-440 to US 70 (Glenwood Avenue)		3,158	N/A	N/A	3,158	3,600	0	3,600
Summit Park Lane - South of SR 1670 (Blue Ridge Road)				-55.56%		-1,000	1,800	800
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive	34,453	35,561	3.22%	2.44%	1,108	1,200	49,200	50,400
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive	35,546	36,680	3.19%	2.42%	1,134	1,200	49,600	50,800
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)	40,343	41,589	3.09%	2.41%	1,246	1,200	49,800	51,000
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall	70,319	69,810	-0.72%	-7.44% ⁽²⁾	-509	-4,700 ⁽²⁾	63,200	58,500
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway	70,215	59,233	-15.64%	-9.38% ⁽²⁾	-10,982	-6,200 ⁽²⁾	66,100	59,900
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	70,215	59,233	-15.64%	-10.38% ⁽²⁾	-10,982	-6,900 ⁽²⁾	66,500	59,600
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Arrow Drive	102,493	84,698	-17.36%	-13.34% ⁽²⁾	-17,795	-12,300 ⁽²⁾	92,200	79,900
US 70 (Glenwood Avenue) - Arrow Drive to I-440	102,493	85,331	-16.74%	-16.21%	-17,162	-15,500	95,600	80,100
US 70 (Glenwood Avenue) - I-440 to Crabtree Valley Avenue	30,863	29,454	-4.57%	-9.74%	-1,409	-3,800	39,000	35,200
US 70 (Glenwood Avenue) - Crabtree Valley Avenue to National Drive	30,863	32,615	5.68%	-0.51%	1,752	-200	39,000	38,800
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive	30,863	32,615	5.68%	-0.80%	1,752	-300	37,700	37,400
US 70 (Glenwood Avenue) - South of Womans Club Drive	30,863	32,615	5.68%	-1.10%	1,752	-400	36,200	35,800
SR 3009 (Creedmoor Road) - West of Riverwood Circle	24,526	23,550	-3.98%	-2.99%	-976	-800	26,800	26,000
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave	24,526	18,083	-26.27%	-2.96%	-6,443	-800	27,000	26,200
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway	20,155	18,083	-10.28%	9.93% ⁽²⁾	-2,072	2,800 ⁽²⁾	28,200	31,000
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	21,400	19,655	-8.15%	8.88% ⁽²⁾	-1,745	2,700 ⁽²⁾	30,400	33,100
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)	41,717	41,792	0.18%	0.51%	75	200	39,000	39,200
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)	5,120	4,778	-6.68%	0.00%	-342	0	11,400	11,400

Table C7: 2017 Build Alternative 2 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive	5,120	3,054	-40.35%	6.60%	-2,066	700	10,600	11,300
SR 1670 (Blue Ridge Road) -Arinto Drive to Summit Park Lane	5,120	3,054	-40.35%	6.25%	-2,066	700	11,200	11,900
SR 1670 (Blue Ridge Road) -Summit Park Lane to Crabtree Valley Avenue	6,424	4,400	-31.51%	6.25%	-2,024	700	11,200	11,900
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane	6,313	4,400	-30.30%	-22.22% (2)	-1,913	-3,400 (2)	15,300	11,900
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway	6,313	4,400	-30.30%	1.63% (2)	-1,913	200 (2)	12,300	12,500
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	24,293	16,661	-31.42%	-25.26% (2)	-7,632	-4,800 (2)	19,000	14,200
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive	30,962	30,623	-1.09%	0.00%	-339	0	30,700	30,700
SR 1820 (Lead Mine Road) - East of North Hills Drive	25,093	25,063	-0.12%	0.00%	-30	0	24,700	24,700
Fairhill Drive - West of US 70 (Glenwood Avenue)				0.00%		0	2,600	2,600
Rembert Drive - East of US 70 (Glenwood Avenue)	2,106	2,116	0.47%	0.00% (1)	10	0 (1)	1,200	1,200
Morehead Drive - East of US 70 (Glenwood Avenue)	2,440	2,469	1.19%	0.00% (1)	29	0 (1)	600	600
Riverwood Circle - South of SR 3009 (Creedmoor Road)		6,104		0.00%		0	1,000	1,000
Commercial Driveway - North of SR 3009 (Creedmoor Road)	1,523	1,522	-0.07%	0.00% (1)	-1	0 (1)	400	400
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)	429	721	68.07%	-1.61% (1)	292	-100 (1)	6,200	6,100
Crabtree Apartments Driveway - North of Edwards Mill Road				42.86%		1,200	2,800	4,000
Edwards Mill Road - West of Crabtree Apartments Driveway		6,104		0.00%		0	3,200	3,200
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue		6,104		27.27%		1,200	4,400	5,600
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)	26,518	13,972	-47.31%	-23.81% (2)	-12,546	-1,500 (2)	6,300	4,800
Marriot Drive - East of US 70 (Glenwood Avenue)	3,566	4,405	23.53%	0.00% (1)	839	0 (1)	2,600	2,600
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)		1,734		262.50% (2)		6,300 (2)	2,400	8,700
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue		1,734		279.17% (2)		6,700 (2)	2,400	9,100
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue	4,388	26,383	501.25%	173.53% (2)	21,995	5,900 (2)	3,400	9,300
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)				-26.92%		-700	2,600	1,900
Arinto Drive - North of SR 1670 (Blue Ridge Road)				0.00%		0	800	800

Table C7: 2017 Build Alternative 2 Traffic Volumes

Forecast Location	2013 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2017 Forecast Volumes	
	No-Build	Build					No-Build	Build
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)	22,198	12,459	-43.87%	-49.46% ⁽²⁾	-9,739	-4,600 ⁽²⁾	9,300	4,700
North Hills Drive - North of SR 1820 (Lead Mine Road)				0.00%		0	800	800
North Hills Drive - South of SR 1820 (Lead Mine Road)	7,074	6,638	-6.16%	0.00%	-436	0	7,600	7,600
Crabtree View Place - West of US 70 (Glenwood Avenue)		820		-100.00%		-3,400	3,400	0
Arrow Drive - West of US 70 (Glenwood Avenue)				-33.33%		-400	1,200	800
Arrow Drive - West of Crabtree Valley Avenue						800	0	800
Arrow Drive - East of Crabtree Valley Avenue						800	0	800
National Drive - West of US 70 (Glenwood Avenue)				7.69%		100	1,300	1,400
National Drive - East of US 70 (Glenwood Avenue)				0.00%		0	1,600	1,600
Womans Club Drive - West of US 70 (Glenwood Avenue)				14.29%		100	700	800
Womans Club Drive - East of US 70 (Glenwood Avenue)				0.00%		0	3,600	3,600
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street	58,194	58,310	0.20%	0.00%	116	0	50,200	50,200
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St	62,711	62,962	0.40%	0.00%	251	0	56,900	56,900
SR 1005 (Six Forks Road) - Front St to I-440	66,066	66,563	0.75%	0.00%	497	0	64,500	64,500
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	18,455	18,779	1.76%	0.00%	324	0	37,200	37,200
SR 1005 (Six Forks Road) - South of Ramblewood Dr	18,455	18,779	1.76%	0.00%	324	0	35,200	35,200
SR 1005 (Six Forks Road) - North of Barrett Drive	18,455	18,779	1.76%	0.00%	324	0	31,300	31,300
SR 1005 (Six Forks Road) - South of Barrett Drive	11,420	11,923	4.40%	0.00%	503	0	32,400	32,400
Main Street - West of SR 1005 (Six Forks Road)				0.00%		0	9,500	9,500
Dartmouth Road - East of SR 1005 (Six Forks Road)	6,578	6,660	1.25%	0.00%	82	0	9,800	9,800
Front St - East of SR 1005 (Six Forks Road)	7,292	7,311	0.26%	0.00% ⁽¹⁾	19	0 ⁽¹⁾	10,800	10,800
Ramblewood Dr - West of SR 1005 (Six Forks Road)				0.00%		0	5,200	5,200
Barrett Drive - East of SR 1005 (Six Forks Road)		12,453		0.00%		0	5,500	5,500

Notes:

(1) Diversion rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

(2) The data from the TRM is not fully representative of the distribution of traffic volumes for this location, please see Section 5.2 of the Traffic Forecast Report for more information

Table C8: 2045 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2013-2045	2017-2045	2013-2045	2017-2045	2045 Model	2045 Forecast
I-440 - West of Lake Boone Trail	122,000	1.78%	0.21%	1.17%	1.10%	54,913	43,800	176,578	165,800
I-440 - Lake Boone Trail to Ridge Rd	131,000	1.98%	0.42%	1.14%	1.10%	51,462	47,000	169,408	178,000
I-440 - Ridge Rd to US 70 (Glenwood Ave)	140,000			1.17%	1.08%	54,414	49,000	175,519	189,000
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Rd)	156,800	1.75%	0.09%	1.36%	1.20%	71,242	62,200	202,490	219,000
I-440 - East of SR 1005 (Six Forks Road)	141,300	1.87%	0.18%	1.42%	1.35%	74,258	64,400	204,037	205,700
Lake Boone Trail - North of Wycliff Rd	34,400	1.50%	0.30%	1.11%	0.82%	8,388	8,800	28,218	43,200
Lake Boone Trail - Wycliff Rd to Myron Dr	36,000			0.86%	0.83%	9,155	9,400	38,218	45,400
Lake Boone Trail - Myron Dr to I-440	39,400	1.96%	0.31%	0.86%	0.80%	9,155	9,800	38,218	49,200
Lake Boone Trail - I-440 to Ridge Rd	12,200	0.32%	-0.08%	2.95% 3.13%	2.51%	19,280 17,706	12,200	31,838 28,244	24,400
Lake Boone Trail - South of Ridge Road	9,500	0.13%	-0.42%	3.65%	3.09%	18,201	12,800	26,688	22,300
Wycliff Rd - East of Lake Boone Trail	14,000			1.97%	1.13%	3,897	5,200	8,402	19,200
Myron Dr - West of Lake Boone Trail	2,200			0.42%	0.60% ⁽³⁾	844	400 ⁽³⁾	6,688	2,600
Myron Dr - East of Lake Boone Trail	4,400				0.60%		800		5,200
Ridge Rd - I-440 to Varnell Ave	10,000			0.89% 1.30%	0.94%	3,513 2,738	3,000	14,207 8,071	13,000
Ridge Rd - Varnell Ave to Manuel St	9,800			1.30% 0.89%	0.93%	2,738 3,513	2,900	8,071 14,207	12,700
Ridge Rd - Manuel Street to Glen Eden Rd	9,800			0.83%	0.93%	1,603	2,900	6,896	12,700
Ridge Rd - Glen Eden Road to Lake Boone Trail	10,100			1.67% 1.70%	1.09%	1,698 2,827	3,600	4,125 6,780	13,700

Notes:

(1) Growth rate shown is the Compound Annual Growth Rate (CAGR).

(2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes

(3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Table C8: 2045 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2013-2045	2017-2045	2013-2045	2017-2045	2045 Model	2045 Forecast
Ridge Rd - West of Lake Boone Trail	9,200	4.28%	4.28%	6.18%	1.01%	1,141	3,000	1,337	12,200
Varnell Ave - East of Ridge Rd	800				0.42%		100		900
Manuel St - East of Ridge Road	600			0.97%	1.03% ⁽³⁾	1,957	200 ⁽³⁾	7,355	800
Glen Eden Rd - West of Ridge Road	12,500	2.21%	1.66%	2.36%	1.80%	8,581	8,100	16,329	20,600
Glen Eden Rd - East of Ridge Road	8,800	5.25%	2.92%	2.18%	1.97%	7,062	6,400	14,170	15,200
BB&T Driveway - North of SR 3009 (Creedmoor Road)	500				1.21%		200		700
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Rd	4,100			0.29%	1.98%	441	3,000	4,939	7,100
Crabtree Valley Ave - Edwards Mill Rd to Crabtree Valley Mall Dwy/SR 1669 (Homewood Banks Dr)	6,500			0.29%	1.66%	441	3,800	4,939	10,300
Crabtree Valley Ave - Crabtree Valley Mall Dwy/SR 1669 (Homewood Banks Dr) to SR 1670 (Blue Ridge Rd)	5,500			7.89%	1.81%	1,141	3,600	1,251	9,100
Summit Park Ln - South of SR 1670 (Blue Ridge Road)	1,800				1.32%		800		2,600
US 70 (Glenwood Ave) - North of Rembert Dr/Fairhill Dr	49,200	-0.29%	-0.79%	0.76%	0.59%	9,504	8,800	43,957	58,000
US 70 (Glenwood Ave) - Rembert Dr/Fairhill Dr to Morehead Dr	49,600			0.82% 0.52%	0.57%	10,586 7,027	8,600	46,132 46,132	58,200
US 70 (Glenwood Ave) - Morehead Dr to NC 50 (Creedmoor Rd)	49,800	-0.13%	-0.38%	0.56%	0.57%	7,902	8,600	48,245	58,400
US 70 (Glenwood Ave) - NC 50 (Creedmoor Rd) to Marriot Dr/Crabtree Valley Mall	63,200			0.55%	0.60%	13,494	11,600	83,813	74,800
US 70 (Glenwood Ave) - Marriot Dr/Crabtree Valley Mall to Crabtree Valley Mall Dwy	66,100	0.42%	-0.36%	0.67%	0.59%	16,650	11,900	86,865	78,000
US 70 (Glenwood Ave) - Crabtree Valley Mall Dwy to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	66,500			0.67%	0.59%	16,650	11,900	86,865	78,400
US 70 (Glenwood Ave) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place	92,200			0.56%	0.57%	20,075	16,000	122,568	108,200

Notes:

(1) Growth rate shown is the Compound Annual Growth Rate (CAGR).

(2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes

(3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Table C8: 2045 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2013-2045	2017-2045	2013-2045	2017-2045	2045 Model	2045 Forecast
US 70 (Glenwood Ave) - Crabtree View Place to Arrow Dr	95,000			0.56%	0.60%	20,075	17,400	122,568	112,400
US 70 (Glenwood Ave) - Arrow Drive to I-440	95,600	1.56%	-0.02%	0.56%	0.60%	20,075	17,400	122,568	113,000
US 70 (Glenwood Ave) - I-440 to National Dr	39,000			1.67%	1.55%	21,527	21,000	52,390	60,000
US 70 (Glenwood Ave) - National Dr to Womans Club Dr	37,700			1.67%	1.59%	21,527	20,900	52,390	58,600
US 70 (Glenwood Ave) - South of Womans Club Dr	36,200			1.67%	1.60%	21,527	20,200	52,390	56,400
SR 3009 (Creedmoor Rd) - West of Riverwood Circle	26,800	1.98%	2.64%	0.97%	1.02%	8,902	8,800	33,428	35,600
SR 3009 (Creedmoor Rd) - Riverwood Circle to BB&T Dwy/Crabtree Valley Ave	27,000			0.97%	1.01%	8,902	8,800	33,428	35,800
SR 3009 (Creedmoor Rd) - BB&T Dwy/Crabtree Valley Ave to Crabtree Valley Mall Dwy	28,200			1.28%	1.09%	10,105	10,000	30,260	38,200
SR 3009 (Creedmoor Rd) - Crabtree Valley Mall Dwy to US 70 (Glenwood Ave)	30,400	2.22%	1.07%	1.31%	1.02%	11,026	10,000	32,426	40,400
NC 50 (Creedmoor Rd) - East of US 70 (Glenwood Avenue)	39,000	-0.34%	-0.32%	0.84%	1.03%	12,841	13,000	54,558	52,000
SR 1670 (Blue Ridge Rd) - West of SR 1669 (Homewood Banks Dr)	11,400			3.33%	2.57%	9,472	11,800	14,592	23,200
SR 1670 (Blue Ridge Rd) - SR 1669 (Homewood Banks Dr) to Arinto Dr	10,600	-0.20%	-1.17%	3.33%	2.64%	9,472	11,400	14,592	22,000
SR 1670 (Blue Ridge Rd) - Arinto Dr to Crabtree Valley Ave/Summit Park Ln	11,200			3.33% 2.96%	2.54%	9,472 9,912	11,400	14,592 16,336	22,600
SR 1670 (Blue Ridge Rd) - East of Crabtree Valley Ave/Summit Park Ln	15,300			2.76%	1.78%	8,775	9,800	15,088	25,100
SR 1670 (Blue Ridge Rd) - West of Crabtree Valley Mall Dwy	12,300			2.76%	1.93%	8,775	8,700	15,088	21,000

Notes:

(1) Growth rate shown is the Compound Annual Growth Rate (CAGR).

(2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes

(3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Table C8: 2045 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2013-2045	2017-2045	2013-2045	2017-2045	2045 Model	2045 Forecast
SR 1670 (Blue Ridge Rd) - Crabtree Valley Mall Dwy to US 70 (Glenwood Ave)	19,000	2.45%	2.50%	0.44%	1.42%	3,628	9,200	27,921	28,200
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Ave) to North Hills Dr	30,700	-0.35%	-0.25%	1.08%	1.11%	12,672	11,100	43,634	41,800
SR 1820 (Lead Mine Rd) - East of North Hills Dr	24,700	1.50%	0.99%	1.07%	1.11%	10,180	8,900	35,273	33,600
Fairhill Dr - West of US 70 (Glenwood Ave)	2,600				0.96%		800		3,400
Rembert Dr - East of US 70 (Glenwood Ave)	1,200			1.41%	1.46% ⁽³⁾	1,195	600 ⁽³⁾	3,301	1,800
Morehead Dr - East of US 70 (Glenwood Ave)	600			1.76%	1.03% ⁽³⁾	1,818	200 ⁽³⁾	4,258	800
Riverwood Circle - South of SR 3009 (Creedmoor Rd)	1,000				1.69%		600		1,600
Commercial Dwy - North of SR 3009 (Creedmoor Rd)	400			2.59%	1.46% ⁽³⁾	1,931	200 ⁽³⁾	3,454	600
Crabtree Valley Mall Dwy - South of SR 3009 (Creedmoor Rd)	6,200			0.16%	0.33% ⁽³⁾	64	600 ⁽³⁾	493	6,800
Crabtree Apartments Dwy - North of Edwards Mill Rd	2,800				1.46%		1,400		4,200
Edwards Mill Rd - West of Crabtree Apartments Dwy	3,200				1.89%		2,200		5,400
Edwards Mill Rd - Crabtree Apartments Dwy to Crabtree Valley Ave	4,400				1.57%		2,400		6,800
Crabtree Valley Mall - West of US 70 (Glenwood Ave)	6,300			0.16%	0.27% ⁽³⁾	2,298	500 ⁽³⁾	28,816	6,800
Marriot Dr - East of US 70 (Glenwood Ave)	2,600			0.12%	0.51% ⁽³⁾	141	400 ⁽³⁾	3,707	3,000
SR 1669 (Homewood Banks Dr) - North of SR 1670 (Blue Ridge Rd)	2,400	-5.94%	-8.18%		1.25%		1,000		3,400
SR 1669 (Homewood Banks Dr) - West of Crabtree Valley Ave	2,400				1.46%		1,200		3,600
Crabtree Valley Mall Dwy - East of Crabtree Valley Ave	3,400			0.16%	0.40% ⁽³⁾	-53	400 ⁽³⁾	4,335	3,800
Crabtree Valley Mall Dwy - West of US 70 (Glenwood Ave)	2,600				0.27%		200		2,800
Arinto Dr - North of SR 1670 (Blue Ridge Rd)	800				1.46%		400		1,200
Crabtree Valley Mall Dwy - North of SR 1670 (Blue Ridge Rd)	9,300			0.16%	0.33% ⁽³⁾	461	900 ⁽³⁾	22,659	10,200

Notes:

(1) Growth rate shown is the Compound Annual Growth Rate (CAGR).

(2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes

(3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Growth rates shown with **ORANGE VALUES** represent the growth rate for the Crabtree Valley Mall TAZ as a whole, and not individual centroid connectors

Table C8: 2045 No-Build Traffic Volumes

Forecast Location	Forecast 2017 Base Year NB	Historic Growth Rate		Model Growth Rate ⁽¹⁾	Chosen Growth Rate ⁽¹⁾	Model Volume Delta ⁽²⁾	Chosen Volume Delta ⁽²⁾	Future Year No-Build Volumes	
	AADT	2007-2016	1997-2016	2013-2045	2017-2045	2013-2045	2017-2045	2045 Model	2045 Forecast
North Hills Dr - North of SR 1820 (Lead Mine Rd)	800				0.80%		200		1,000
North Hills Dr - South of SR 1820 (Lead Mine Rd)	7,600	0.29%	-2.52%	0.99%	0.98%	2,616	2,400	9,690	10,000
Crabtree View Place - West of US 70 (Glenwood Ave)	3,400				1.53%		1,800		5,200
Arrow Dr - West of US 70 (Glenwood Ave)	1,200				1.03%		400		1,600
National Dr - West of US 70 (Glenwood Ave)	1,300				0.74%		300		1,600
National Dr - East of US 70 (Glenwood Ave)	1,600				1.75%		1,000		2,600
Womans Club Dr - West of US 70 (Glenwood Ave)	700				0.48%		100		800
Womans Club Dr - East of US 70 (Glenwood Ave)	3,600				1.84%		2,400		6,000
SR 1005 (Six Forks Rd) - North of Dartmouth Rd/Main St	50,200	2.11%	0.22%	1.11%	1.11%	24,772	18,100	82,966	68,300
SR 1005 (Six Forks Rd) - Dartmouth Rd/Main St to Front St	56,900	1.28%	0.34%	1.04%	1.20%	24,550	22,500	87,261	79,400
SR 1005 (Six Forks Rd) - Front St to I-440	64,500			1.44%	1.20%	38,198	25,600	104,264	90,100
SR 1005 (Six Forks Rd) - I-440 to Ramblewood Dr	37,200			3.15%	1.90%	31,325	25,800	49,780	63,000
SR 1005 (Six Forks Rd) - South of Ramblewood Dr	35,200	-1.02%	-1.30%	3.15%	1.94%	31,325	25,000	49,780	60,200
SR 1005 (Six Forks Rd) - North of Barrett Dr	31,300			3.15%	1.90%	31,325	21,700	49,780	53,000
SR 1005 (Six Forks Rd) - South of Barrett Dr	32,400			3.68%	1.91%	24,871	22,600	36,291	55,000
Main St - West of SR 1005 (Six Forks Rd)	9,500				1.01%		3,100		12,600
Dartmouth Rd - East of SR 1005 (Six Forks Rd)	9,800	-6.92%	-5.09%	1.60%	3.20%	4,368	13,900	10,946	23,700
Front St - East of SR 1005 (Six Forks Rd)	10,800			4.50%	1.30% ⁽³⁾	22,530	4,700 ⁽³⁾	29,822	15,500
Ramblewood Dr - West of SR 1005 (Six Forks Rd)	5,200				0.51%		800		6,000
Barrett Dr - East of SR 1005 (Six Forks Rd)	5,500				2.76%		6,300		11,800

Notes:

- (1) Growth rate shown is the Compound Annual Growth Rate (CAGR).
- (2) Volume Delta is the raw change in volume between either the model volumes or the forecast volumes
- (3) Growth rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

Table C9: 2045 Build Alternative 1 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
I-440 - West of Lake Boone Trail	176,578	181,411	2.74%	2.90%	4,833	4,800	165,800	170,600
I-440 - Lake Boone Trail to Ridge Road/Crabtree Valley Avenue	169,408	175,523	3.61%	3.37%	6,115	6,000	178,000	184,000
I-440 - Ridge Rd/Crabtree Valley Ave to US 70 (Glenwood)	175,519	165,184	-5.89%	-2.80% (2)	-10,335	-5,300 (2)	189,000	183,700
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	202,490	204,551	1.02%	0.00%	2,061	0	219,000	219,000
I-440 - East of SR 1005 (Six Forks Road)	204,037	204,835	0.39%	0.00%	798	0	205,700	205,700
Lake Boone Trail - North of Wycliff Rd	28,218	25,097	-11.06%	-1.85%	-3,121	-800	43,200	42,400
Lake Boone Trail - Wycliff Rd to Myron Drive	38,218	33,230	-13.05%	-4.41%	-4,988	-2,000	45,400	43,400
Lake Boone Trail - Myron Drive to I-440	38,218	33,230	-13.05%	-4.07%	-4,988	-2,000	49,200	47,200
Lake Boone Trail - I-440 to Ridge Road	31,838	32,763	2.91%	0.00%	925	0	24,400	24,400
Lake Boone Trail - South of Ridge Road	26,688	26,588	-0.37%	0.00%	-100	0	22,300	22,300
Wycliff Rd - East of Lake Boone Trail	8,402	6,265	-25.43%	-6.25%	-2,137	-1,200	19,200	18,000
Myron Drive - West of Lake Boone Trail	6,688	6,675	-0.19%	0.00%	-13	0	2,600	2,600
Myron Drive - East of Lake Boone Trail				0.00%		0	5,200	5,200
Ridge Rd - I-440 to Varnell Ave	14,207	11,731	-17.43%	0.00% (2)	-2,476	0 (2)	13,000	13,000
Ridge Rd - Varnell Ave to Manual Street	8,071	10,235	26.81%	0.00% (2)	2,164	0 (2)	12,700	12,700
Ridge Road - Manuel Street to Glen Eden Road	6,896	4,487	-34.93%	0.00% (2)	-2,409	0 (2)	12,700	12,700
Ridge Road - Glen Eden Road to Lake Boone Trail	4,125	3,362	-18.50%	0.00%	-763	0	13,700	13,700
Ridge Road - West of Lake Boone Trail	1,337	1,274	-4.71%	0.00%	-63	0	12,200	12,200
Varnell Ave - East of Ridge Rd				0.00%		0	900	900
Manuel Street - East of Ridge Road	7,355	7,555	2.72%	0.00% (1)	200	0 (1)	800	800
Glen Eden Road - West of Ridge Road	16,329	12,806	-21.58%	0.00%	-3,523	0	20,600	20,600
Glen Eden Road - East of Ridge Road	14,170	13,681	-3.45%	0.00%	-489	0	15,200	15,200
BB&T Driveway - North of SR 3009 (Creedmoor Road)				0.00%		0	700	700
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road	4,939			98.59%		7,000	7,100	14,100
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)	4,939	8,214	66.31%	75.73% (2)	3,275	7,800 (2)	10,300	18,100
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)	1,251	17,850	1326.86%	126.37% (2)	16,599	11,500 (2)	9,100	20,600
Crabtree Valley Avenue - SR 1670 (Blue Ridge Road) to I-440		50,634	N/A	N/A	50,634	22,600 (2)	0	22,600

Table C9: 2045 Build Alternative 1 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
Summit Park Lane - South of SR 1670 (Blue Ridge Road)				0.00%		0	2,600	2,600
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive	43,957	46,194	5.09%	3.10%	2,237	1,800	58,000	59,800
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive	46,132	48,594	5.34%	3.09%	2,462	1,800	58,200	60,000
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)	48,245	50,661	5.01%	3.08%	2,416	1,800	58,400	60,200
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall	83,813	84,331	0.62%	-2.14% (2)	518	-1,600 (2)	74,800	73,200
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway	86,865	79,684	-8.27%	-3.72% (2)	-7,181	-2,900 (2)	78,000	75,100
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	86,865	79,684	-8.27%	-3.06% (2)	-7,181	-2,400 (2)	78,400	76,000
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Crabtree View Place	122,568	97,618	-20.36%	-12.85% (2)	-24,950	-13,900 (2)	108,200	94,300
US 70 (Glenwood Avenue) - Crabtree View Place to Arrow Drive	122,568	97,618	-20.36%	-13.35% (2)	-24,950	-15,000 (2)	112,400	97,400
US 70 (Glenwood Avenue) - Arrow Drive to I-440	122,568	97,618	-20.36%	-13.27% (2)	-24,950	-15,000 (2)	113,000	98,000
US 70 (Glenwood Avenue) - I-440 to National Drive	52,390	53,056	1.27%	1.33%	666	800	60,000	60,800
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive	52,390	53,056	1.27%	1.37%	666	800	58,600	59,400
US 70 (Glenwood Avenue) - South of Womans Club Drive	52,390	53,056	1.27%	1.42%	666	800	56,400	57,200
SR 3009 (Creedmoor Road) - West of Riverwood Circle	33,428	30,439	-8.94%	-8.43%	-2,989	-3,000	35,600	32,600
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave	33,428	26,782	-19.88%	-8.38% (2)	-6,646	-3,000 (2)	35,800	32,800
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway	30,260	26,782	-11.49%	5.24% (2)	-3,478	2,000 (2)	38,200	40,200
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	32,426	28,441	-12.29%	4.46% (2)	-3,985	1,800 (2)	40,400	42,200
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)	54,558	55,764	2.21%	1.54%	1,206	800	52,000	52,800
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)	14,592	16,347	12.03%	8.62%	1,755	2,000	23,200	25,200
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive	14,592	12,320	-15.57%	6.82% (2)	-2,272	1,500 (2)	22,000	23,500
SR 1670 (Blue Ridge Road) - Arinto Drive to Crabtree Valley Avenue/Summit Park Lane	14,592	12,320	-15.57%	6.64% (2)	-2,272	1,500 (2)	22,600	24,100

Table C9: 2045 Build Alternative 1 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane	15,088	29,068	92.66%	-23.11% (2)	13,980	-5,800 (2)	25,100	19,300
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway	15,088	29,068	92.66%	-21.43% (2)	13,980	-4,500 (2)	21,000	16,500
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	27,921	25,589	-8.35%	-36.52% (2)	-2,332	-10,300 (2)	28,200	17,900
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive	43,634	44,911	2.93%	0.00%	1,277	0	41,800	41,800
SR 1820 (Lead Mine Road) - East of North Hills Drive	35,273	36,640	3.88%	0.00%	1,367	0	33,600	33,600
Fairhill Drive - West of US 70 (Glenwood Avenue)				0.00%		0	3,400	3,400
Rembert Drive - East of US 70 (Glenwood Avenue)	3,301	3,321	0.61%	0.00% (1)	20	0 (1)	1,800	1,800
Morehead Drive - East of US 70 (Glenwood Avenue)	4,258	4,306	1.13%	0.00% (1)	48	0 (1)	800	800
Riverwood Circle - South of SR 3009 (Creedmoor Road)		8,214		0.00%		0	1,600	1,600
Commercial Driveway - North of SR 3009 (Creedmoor Road)	3,454	3,563	3.16%	0.00% (1)	109	0 (1)	600	600
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)	493	676	37.12%	-2.94% (2)	183	-200 (2)	6,800	6,600
Crabtree Apartments Driveway - North of Edwards Mill Road				19.05%		800	4,200	5,000
Edwards Mill Road - West of Crabtree Apartments Driveway		8,214		0.00%		0	5,400	5,400
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue		8,214		11.76%		800	6,800	7,600
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)	28,816	18,517	-35.74%	-7.35% (2)	-10,299	-500 (2)	6,800	6,300
Marriot Drive - East of US 70 (Glenwood Avenue)	3,707	4,728	27.54%	0.00% (1)	1,021	0 (1)	3,000	3,000
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)		4,026		14.71%		500	3,400	3,900
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue		4,026		13.89%		500	3,600	4,100
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue	4,335	16,397	278.25%	115.79% (2)	12,062	4,400 (2)	3,800	8,200
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)				17.86%		500	2,800	3,300
Arinto Drive - North of SR 1670 (Blue Ridge Road)				0.00%		0	1,200	1,200
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)	22,659	20,711	-8.60%	-45.10% (2)	-1,948	-4,600 (2)	10,200	5,600
North Hills Drive - North of SR 1820 (Lead Mine Road)				0.00%		0	1,000	1,000
North Hills Drive - South of SR 1820 (Lead Mine Road)	9,690	9,482	-2.15%	0.00%	-208	0	10,000	10,000
Crabtree View Place - West of US 70 (Glenwood Avenue)				-21.15%		-1,100	5,200	4,100
Arrow Drive - West of US 70 (Glenwood Avenue)				0.00%		0	1,600	1,600

Table C9: 2045 Build Alternative 1 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
National Drive - West of US 70 (Glenwood Avenue)				0.00%		0	1,600	1,600
National Drive - East of US 70 (Glenwood Avenue)				0.00%		0	2,600	2,600
Womans Club Drive - West of US 70 (Glenwood Avenue)				0.00%		0	800	800
Womans Club Drive - East of US 70 (Glenwood Avenue)				0.00%		0	6,000	6,000
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street	82,966	81,902	-1.28%	0.00%	-1,064	0	68,300	68,300
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St	87,261	86,413	-0.97%	0.00%	-848	0	79,400	79,400
SR 1005 (Six Forks Road) - Front St to I-440	104,264	103,896	-0.35%	0.00%	-368	0	90,100	90,100
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	49,780	49,677	-0.21%	0.00%	-103	0	63,000	63,000
SR 1005 (Six Forks Road) - South of Ramblewood Dr	49,780	49,677	-0.21%	0.00%	-103	0	60,200	60,200
SR 1005 (Six Forks Road) - North of Barrett Drive	49,780	49,677	-0.21%	0.00%	-103	0	53,000	53,000
SR 1005 (Six Forks Road) - South of Barrett Drive	36,291	36,148	-0.39%	0.00%	-143	0	55,000	55,000
Main Street - West of SR 1005 (Six Forks Road)				0.00%		0	12,600	12,600
Dartmouth Road - East of SR 1005 (Six Forks Road)	10,946	10,977	0.28%	0.00%	31	0	23,700	23,700
Front St - East of SR 1005 (Six Forks Road)	29,822	30,033	0.71%	0.00% ⁽¹⁾	211	0 ⁽¹⁾	15,500	15,500
Ramblewood Dr - West of SR 1005 (Six Forks Road)				0.00%		0	6,000	6,000
Barrett Drive - East of SR 1005 (Six Forks Road)				0.00%		0	11,800	11,800

Notes:

(1) Diversion rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway

(2) The data from the TRM is not fully representative of the distribution of traffic volumes for this location, please see Section 5.2 of the Traffic Forecast Report for more information

Table C10: 2045 Build Alternative 2 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
I-440 - West of Lake Boone Trail	176,578	178,800	1.26%	1.45%	2,222	2,400	165,800	168,200
I-440 - Lake Boone Trail to Ridge Road/Crabtree Valley Avenue	169,408	173,000	2.12%	1.91%	3,592	3,400	178,000	181,400
I-440 - Ridge Road/Crabtree Valley Avenue to US 70 (Glenwood Avenue)	175,519	152,812	-12.94%	-1.22% (2)	-22,707	-2,300 (2)	189,000	186,700
I-440 - US 70 (Glenwood Avenue) to SR 1005 (Six Forks Road)	202,490	204,985	1.23%	0.00%	2,495	0	219,000	219,000
I-440 - East of SR 1005 (Six Forks Road)	204,037	205,030	0.49%	0.00%	993	0	205,700	205,700
Lake Boone Trail - North of Wycliff Rd	28,218	27,489	-2.58%	-1.85%	-729	-800	43,200	42,400
Lake Boone Trail - Wycliff Rd to Myron Drive	38,218	36,727	-3.90%	-3.96%	-1,491	-1,800	45,400	43,600
Lake Boone Trail - Myron Drive to I-440	38,218	36,727	-3.90%	-3.66%	-1,491	-1,800	49,200	47,400
Lake Boone Trail - I-440 to Ridge Road	31,838	31,074	-2.40%	0.00%	-764	0	24,400	24,400
Lake Boone Trail - South of Ridge Road	26,688	26,452	-0.88%	0.00%	-236	0	22,300	22,300
Wycliff Rd - East of Lake Boone Trail	8,402	7,479	-10.99%	-5.21%	-923	-1,000	19,200	18,200
Myron Drive - West of Lake Boone Trail	6,688	6,693	0.07%	0.00%	5	0	2,600	2,600
Myron Drive - East of Lake Boone Trail				0.00%		0	5,200	5,200
Ridge Rd - I-440 to Varnell Ave	14,207	14,322	0.81%	13.85% (2)	115	1,800 (2)	13,000	14,800
Ridge Rd - Varnell Ave to Manuel Street	8,071	12,845	59.15%	14.17% (2)	4,774	1,800 (2)	12,700	14,500
Ridge Road - Manuel Street to Glen Eden Road	6,896	5,828	-15.49%	14.17% (2)	-1,068	1,800 (2)	12,700	14,500
Ridge Road - Glen Eden Road to Lake Boone Trail	4,125	2,815	-31.76%	0.00% (2)	-1,310	0 (2)	13,700	13,700
Ridge Road - West of Lake Boone Trail	1,337	1,245	-6.88%	0.00%	-92	0	12,200	12,200
Varnell Ave - East of Ridge Rd				0.00%		0	900	900
Manuel Street - East of Ridge Road	7,355	8,524	15.89%	0.00% (1)	1,169	0 (1)	800	800
Glen Eden Road - West of Ridge Road	16,329	14,117	-13.55%	4.37%	-2,212	900	20,600	21,500
Glen Eden Road - East of Ridge Road	14,170	12,589	-11.16%	5.92%	-1,581	900	15,200	16,100
BB&T Driveway - North of SR 3009 (Creedmoor Road)				0.00%		0	700	700
Crabtree Valley Ave - SR 3009 (Creedmoor Road) to Edwards Mill Road	4,939			115.49% (2)		8,200 (2)	7,100	15,300
Crabtree Valley Avenue - Edwards Mill Road to Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive)	4,939	8,621	74.55%	93.20% (2)	3,682	9,600 (2)	10,300	19,900
Crabtree Valley Avenue - Crabtree Valley Mall Driveway/SR 1669 (Homewood Banks Drive) to SR 1670 (Blue Ridge Road)	1,251	32,430	2492.33%	132.97% (2)	31,179	12,100 (2)	9,100	21,200
Crabtree Valley Avenue - SR 1670 (Blue Ridge Road) to Arrow Drive		32,430	N/A	N/A	32,430	21,200	0	21,200

Table C10: 2045 Build Alternative 2 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
Crabtree Valley Avenue - Arrow Drive to I-440		32,430	N/A	N/A	32,430	21,800	0	21,800
Crabtree Valley Avenue - I-440 to US 70 (Glenwood Avenue)		5,531	N/A	N/A	5,531	4,500	0	4,500
Summit Park Lane - South of SR 1670 (Blue Ridge Road)		32,430		-46.15%		-1,200	2,600	1,400
US 70 (Glenwood Avenue) - North of Rembert Drive/Fairhill Drive	43,957	45,892	4.40%	3.10%	1,935	1,800	58,000	59,800
US 70 (Glenwood Avenue) - Rembert Drive/Fairhill Drive to Morehead Drive	46,132	48,226	4.54%	3.09%	2,094	1,800	58,200	60,000
US 70 (Glenwood Avenue) - Morehead Drive to NC 50 (Creedmoor Road)	48,245	50,245	4.15%	3.08%	2,000	1,800	58,400	60,200
US 70 (Glenwood Avenue) - NC 50 (Creedmoor Road) to Marriot Drive/Crabtree Valley Mall	83,813	83,198	-0.73%	-4.95% ⁽²⁾	-615	-3,700 ⁽²⁾	74,800	71,100
US 70 (Glenwood Avenue) - Marriot Drive/Crabtree Valley Mall to Crabtree Valley Mall Driveway	86,865	74,053	-14.75%	-6.79% ⁽²⁾	-12,812	-5,300 ⁽²⁾	78,000	72,700
US 70 (Glenwood Ave) - Crabtree Valley Mall Driveway to SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd)	86,865	74,053	-14.75%	-7.65% ⁽²⁾	-12,812	-6,000 ⁽²⁾	78,400	72,400
US 70 (Glenwood Avenue) - SR 1820 (Lead Mine Rd)/SR 1670 (Blue Ridge Rd) to Arrow Drive	122,568	102,901	-16.05%	-10.54% ⁽²⁾	-19,667	-11,400 ⁽²⁾	108,200	96,800
US 70 (Glenwood Avenue) - Arrow Drive to I-440	122,568	102,901	-16.05%	-14.16%	-19,667	-16,000	113,000	97,000
US 70 (Glenwood Avenue) - I-440 to Crabtree Valley Avenue	52,390	48,870	3.84%	-6.83%	-3,520	-4,100	60,000	55,900
US 70 (Glenwood Avenue) - Crabtree Valley Avenue to National Drive	52,390	54,404	3.84%	0.67%	2,014	400	60,000	60,400
US 70 (Glenwood Avenue) - National Drive to Womans Club Drive	52,390	54,404	3.84%	0.68%	2,014	400	58,600	59,000
US 70 (Glenwood Avenue) - South of Womans Club Drive	52,390	54,404	3.84%	0.71%	2,014	400	56,400	56,800
SR 3009 (Creedmoor Road) - West of Riverwood Circle	33,428	29,979	-10.32%	-6.74%	-3,449	-2,400	35,600	33,200
SR 3009 (Creedmoor Road) - Riverwood Circle to BB&T Driveway/Crabtree Valley Ave	33,428	26,536	-20.62%	-6.70%	-6,892	-2,400	35,800	33,400
SR 3009 (Creedmoor Road) - BB&T Driveway/Crabtree Valley Ave to Crabtree Valley Mall Driveway	30,260	26,536	-12.31%	5.76% ⁽²⁾	-3,724	2,200 ⁽²⁾	38,200	40,400
SR 3009 (Creedmoor Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	32,426	28,840	-11.06%	5.20% ⁽²⁾	-3,586	2,100 ⁽²⁾	40,400	42,500
NC 50 (Creedmoor Road) - East of US 70 (Glenwood Avenue)	54,558	55,197	1.17%	0.77%	639	400	52,000	52,400
SR 1670 (Blue Ridge Road) - West of SR 1669 (Homewood Banks Drive)	14,592	16,572	13.57%	7.76%	1,980	1,800	23,200	25,000

Table C10: 2045 Build Alternative 2 Traffic Volumes

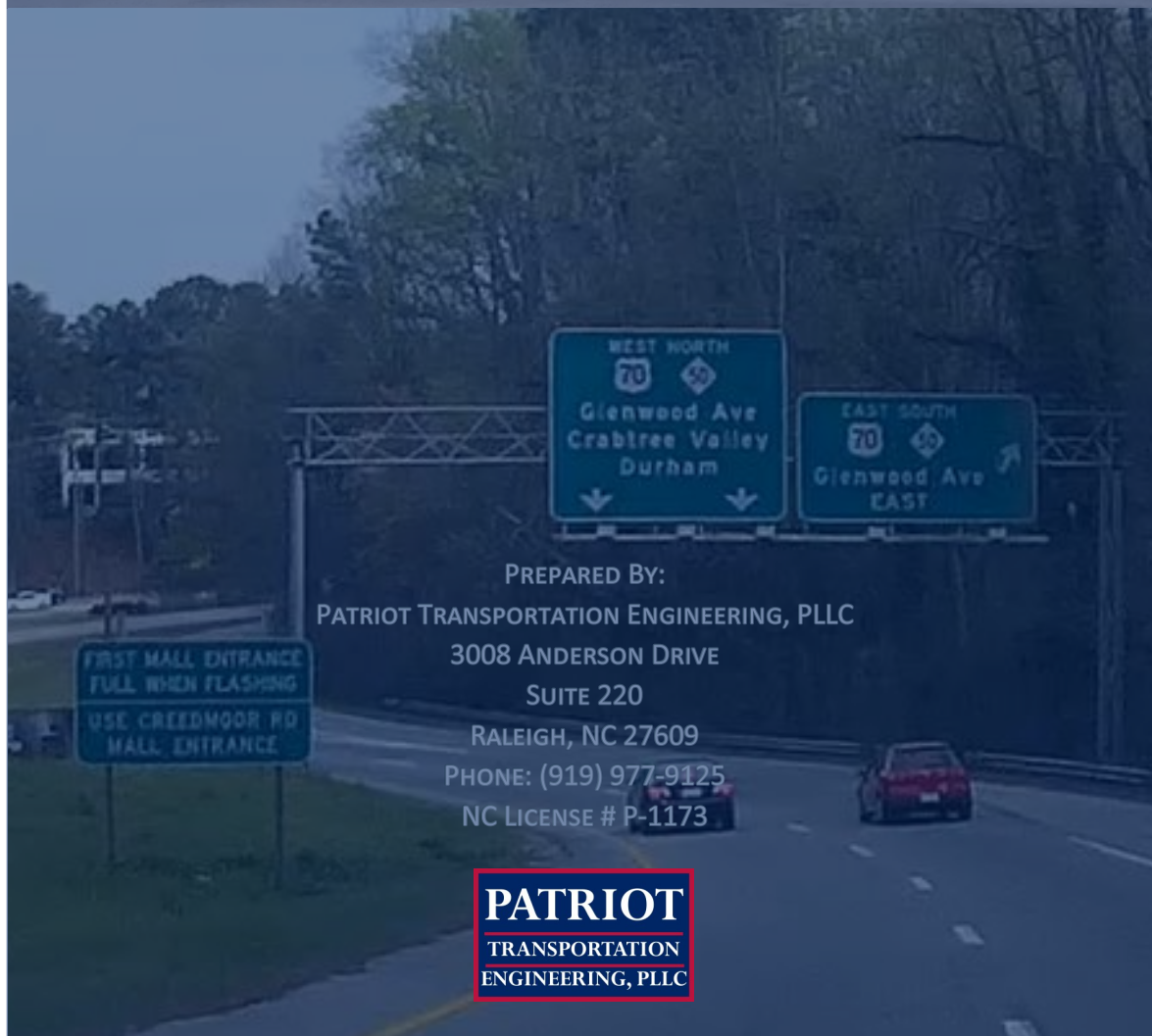
Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
SR 1670 (Blue Ridge Road) - SR 1669 (Homewood Banks Drive) to Arinto Drive	14,592	11,718	-19.70%	-5.91%	-2,874	-1,300	22,000	20,700
SR 1670 (Blue Ridge Road) -Arinto Drive to Summit Park Lane	14,592	11,718	-19.70%	-5.75%	-2,874	-1,300	22,600	21,300
SR 1670 (Blue Ridge Road) -Summit Park Lane to Crabtree Valley Avenue	16,336	13,889	-14.98%	-8.41%	-2,447	-1,900	22,600	20,700
SR 1670 (Blue Ridge Road) - East of Crabtree Valley Avenue/Summit Park Lane	15,088	13,889	-7.95%	-17.53% (2)	-1,199	-4,400 (2)	25,100	20,700
SR 1670 (Blue Ridge Road) - West of Crabtree Valley Mall Driveway	15,088	13,889	-7.95%	4.76% (2)	-1,199	1,000 (2)	21,000	22,000
SR 1670 (Blue Ridge Road) - Crabtree Valley Mall Driveway to US 70 (Glenwood Avenue)	27,921	25,086	-10.15%	-15.60% (2)	-2,835	-4,400 (2)	28,200	23,800
SR 1820 (Lead Mine Rd) - US 70 (Glenwood Avenue) to North Hills Drive	43,634	44,821	2.72%	0.00%	1,187	0	41,800	41,800
SR 1820 (Lead Mine Road) - East of North Hills Drive	35,273	36,353	3.06%	0.00%	1,080	0	33,600	33,600
Fairhill Drive - West of US 70 (Glenwood Avenue)				0.00%		0	3,400	3,400
Rembert Drive - East of US 70 (Glenwood Avenue)	3,301	3,326	0.76%	0.00% (1)	25	0 (1)	1,800	1,800
Morehead Drive - East of US 70 (Glenwood Avenue)	4,258	4,297	0.92%	0.00% (1)	39	0 (1)	800	800
Riverwood Circle - South of SR 3009 (Creedmoor Road)		8,621		0.00%		0	1,600	1,600
Commercial Driveway - North of SR 3009 (Creedmoor Road)	3,454	3,607	4.43%	0.00% (1)	153	0 (1)	600	600
Crabtree Valley Mall Driveway - South of SR 3009 (Creedmoor Road)	493	849	72.21%	-1.47% (1)	356	-100 (1)	6,800	6,700
Crabtree Apartments Driveway - North of Edwards Mill Road				33.33%		1,400	4,200	5,600
Edwards Mill Road - West of Crabtree Apartments Driveway		8,621		0.00%		0	5,400	5,400
Edwards Mill Road - Crabtree Apartments Driveway to Crabtree Valley Avenue		8,621		20.59%		1,400	6,800	8,200
Crabtree Valley Mall - West of US 70 (Glenwood Avenue)	28,816	13,749	-52.29%	-23.53% (2)	-15,067	-1,600 (2)	6,800	5,200
Marriot Drive - East of US 70 (Glenwood Avenue)	3,707	4,765	28.54%	0.00% (1)	1,058	0 (1)	3,000	3,000
SR 1669 (Homewood Banks Drive) - North of SR 1670 (Blue Ridge Road)		5,501		344.12% (2)		11,700 (2)	3,400	15,100
SR 1669 (Homewood Banks Drive) - West of Crabtree Valley Avenue		5,501		336.11% (2)		12,100 (2)	3,600	15,700
Crabtree Valley Mall Driveway - East of Crabtree Valley Avenue	4,335	30,320	599.42%	168.42% (2)	25,985	6,400 (2)	3,800	10,200
Crabtree Valley Mall Driveway - West of US 70 (Glenwood Ave)				-25.00%		-700	2,800	2,100
Arinto Drive - North of SR 1670 (Blue Ridge Road)				0.00%		0	1,200	1,200
Crabtree Valley Mall Driveway - North of SR 1670 (Blue Ridge Road)	22,659	11,384	-49.76%	-49.02% (2)	-11,275	-5,000 (2)	10,200	5,200

Table C10: 2045 Build Alternative 2 Traffic Volumes

Forecast Location	2045 Model Volumes, Daily		Model Diversion Percent	Chosen Diversion Percent	Model Volume Delta	Chosen Volume Delta	2045 Forecast Volumes	
	No-Build	Build					No-Build	Build
North Hills Drive - North of SR 1820 (Lead Mine Road)				0.00%		0	1,000	1,000
North Hills Drive - South of SR 1820 (Lead Mine Road)	9,690	9,688	-0.02%	0.00%	-2	0	10,000	10,000
Crabtree View Place - West of US 70 (Glenwood Avenue)				-100.00%		-5,200	5,200	0
Arrow Drive - West of US 70 (Glenwood Avenue)				-25.00%		-400	1,600	1,200
Arrow Drive - West of Crabtree Valley Avenue						1,200	0	1,200
Arrow Drive - East of Crabtree Valley Avenue						1,000	0	1,000
National Drive - West of US 70 (Glenwood Avenue)				0.00%		0	1,600	1,600
National Drive - East of US 70 (Glenwood Avenue)				0.00%		0	2,600	2,600
Womans Club Drive - West of US 70 (Glenwood Avenue)				0.00%		0	800	800
Womans Club Drive - East of US 70 (Glenwood Avenue)				0.00%		0	6,000	6,000
SR 1005 (Six Forks Road) - North of Dartmouth Road/Main Street	82,966	81,930	-1.25%	0.00%	-1,036	0	68,300	68,300
SR 1005 (Six Forks Road) - Dartmouth Road/Main Street to Front St	87,261	86,472	-0.90%	0.00%	-789	0	79,400	79,400
SR 1005 (Six Forks Road) - Front St to I-440	104,264	103,955	-0.30%	0.00%	-309	0	90,100	90,100
SR 1005 (Six Forks Road) - I-440 to Ramblewood Dr	49,780	49,479	-0.60%	0.00%	-301	0	63,000	63,000
SR 1005 (Six Forks Road) - South of Ramblewood Dr	49,780	49,479	-0.60%	0.00%	-301	0	60,200	60,200
SR 1005 (Six Forks Road) - North of Barrett Drive	49,780	49,479	-0.60%	0.00%	-301	0	53,000	53,000
SR 1005 (Six Forks Road) - South of Barrett Drive	36,291	35,885	-1.12%	0.00%	-406	0	55,000	55,000
Main Street - West of SR 1005 (Six Forks Road)				0.00%		0	12,600	12,600
Dartmouth Road - East of SR 1005 (Six Forks Road)	10,946	10,974	0.26%	0.00%	28	0	23,700	23,700
Front St - East of SR 1005 (Six Forks Road)	29,822	29,951	0.43%	0.00% ⁽¹⁾	129	0 ⁽¹⁾	15,500	15,500
Ramblewood Dr - West of SR 1005 (Six Forks Road)				0.00%		0	6,000	6,000
Barrett Drive - East of SR 1005 (Six Forks Road)				0.00%		0	11,800	11,800

Notes:

- (1) Diversion rate and model volumes shown are for a centroid connector that was determined to be representative of the change in volume for the subject roadway
- (2) The data from the TRM is not fully representative of the distribution of traffic volumes for this location, please see Section 5.2 of the Traffic Forecast Report for more information



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