

Date
4/27/16

To
Beau Memory
Executive Director
NC Turnpike Authority



**PROJECT
CORRESPONDENCE**

From
Kiersten Bass
Planning Services Manager, HNTB

Subject
Complete 540 - Information in response to
SELC and RTA joint letter to NCDOT and NCTA
dated March 7, 2016

This memo was developed by the Complete 540 project team. The purpose of this memo is to provide information requested by SELC and RTA's joint letter dated, dated March 7, 2016. The four topics included in SELC/RTA's letter are listed below.

1) Confirm cost increases and rescore if necessary.

The cost estimates and the corresponding increases currently in question were prepared at different times and contain different items; therefore, they should not be compared directly. **Table 1** illustrates the different items that constitute the two estimates and describes the differences. Key points to note regarding the STI and STIP project costs are:

February 2014 STI Project Costs:

1. The STI estimate was prepared in February 2014 using 2013 costs.
2. The capital costs were developed using the quantities for the alignments that followed the MPO Thoroughfare Plan (quantities for other alignments were not available at the time).
3. Estimates used to score projects in STI do not include bond interest expenses, prior years' expenditures, environmental mitigation costs, or administrative reserve funds.

February 2016 STIP Project Costs:

1. The capital cost estimates reflect the average cost of all 17 alternatives in 2015 dollars.
2. The 90th percentile cost from the probabilistic model was used (worst case), rather than 70th as typically used by FHWA for financial planning.
3. Administrative expenses and reserves were also included (typical for toll financing but not traditionally funded projects).
4. Updated right of way cost estimates for all 17 alternatives using functional plans and certified appraisers were used.
5. Updated utility cost estimates for all 17 alternatives using functional plans and field verifications were used.
6. Interest costs for GARVEE bonds were included.
7. Prior year expenditures were included.

TABLE 1: COMPARISON OF CAPITAL COST ESTIMATES				
Cost Item	February 2014 STI		February 2016 STIP	
Date of Estimate	February 2014	2013 (\$)	August 2015	2015 (\$)
Construction Quantities and Costs	From best available data from protected corridor and Thoroughfare Plan. Probabilistic model not yet developed.	1,128,546,000	Average of all 17 alignments. 90 th percentile cost (high end) of the probabilistic model.	1,417,300,000
Administrative costs and reserves	Not included	--	Included	101,700,000
Right of way estimates	Sketch level estimate	120,900,000	Tax records and parcel data for each impacted property on all 17 corridors. Average cost of all 17 alignments and 90 th percentile used.	376,000,000
Utility estimates	Sketch level estimate	16,450,000	Field reconnaissance and functional design plans. Average cost of all 17 alignments and 90 th percentile used.	59,000,000
Environmental Mitigation	Sketch level estimate (standard practice to include in STIP in 2014)	63,212,000	No longer standard practice to include in STIP	--
GARVEE interest costs	Not included	--	Included for R-2721 & R-2828	132,292,000
Prior Years' Costs	Not included	--	Included	41,688,000
Total		1,329,108,000		2,127,980,000

The most current cost estimates for the project were developed for the Preferred Alternative, recommended in February 2016. The most recent cost estimates, shown in **Table 2**, were provided to both the STIP Unit and the Strategic Prioritization Unit in February 2016 and are currently being used in the working model of the STIP as well as Version P4.0 of STI. As shown in **Table 2**, the comparable difference from the 2014 STI project costs and the most current 2016 project cost estimate are \$225M (17.8%).

TABLE 2: PREFERRED ALTERNATIVE CAPITAL COST ESTIMATES			
Description	Estimate (2015\$)*	Cost Increase (\$M) from February 2014 Estimate	Percent (%) Change from February 2014 Estimate
Construction	1,204,600,000	76	6.7
Right of Way	232,300,000	111	92.1
Utilities	54,300,000	38	230.1
Total Cost in STIP	1,491,200,000	225	17.8

* The 70th percentile costs from the probabilistic model, rather than the 90th percentile costs used previously, were used to reflect FHWA guidance.

The Complete 540 project is included in the STIP as three projects (R-2721, R-2828, and R-2829) and is planned for three implementation phases. Funding for R-2721 is scheduled to begin in Fiscal Year 2017 and funding for R-2828 is scheduled to begin in Fiscal Year 2024. Funding for R-2829 has not yet been scheduled, and is not planned

before 2025. Projects that have funding programmed in the first five years of the STIP are considered “committed” projects; therefore the R-2721 project will not be reevaluated in Version P4.0 of STI. The R-2828 and R-2829 projects will be reevaluated in Version P4.0 of STI with updated cost information.

North Carolina’s STIP is updated every two years and developed in concert with federal and state revenue forecasts, NCDOT’s Strategic Prioritization process, preconstruction and project development timetables, and in adherence with federal and state laws.

The STIP identifies the construction funding for and scheduling of transportation projects at the state level over a 10-year period. Although federal law requires the STIP to be updated every four years, NCDOT updates it every two years to ensure it accurately reflects the state’s current financial situation. The STI law also mandates ongoing evaluation and improvement to ensure the process continues to be responsive to North Carolina’s diverse needs. Work is currently underway to update the STIP for 2018-2027.

2) Clarify the percentage of cost covered by tolls and the projected toll rates.

The Triangle Expressway’s initial project costs, including construction, reserve accounts, capitalized interest, and bond insurance, totaled \$1,009M. Toll revenue directly backs \$657M (65%) of the initial project costs; in addition, toll revenues provide for the entire project’s operational and maintenance costs for the life of the project.

For the Complete 540 project, NCTA is contracting with a consulting firm to develop an investment level Traffic and Revenue Study. Additionally, NCDOT and NCTA will continue to update and refine the project’s capital cost estimates. Based on the most current information available, the percentages of the Complete 540 costs covered by tolls per segment are shown in **Table 3**. It is important to note that the toll revenues will also provide for all of the project’s operational and maintenance costs for the life of the project.

The toll rates for Complete 540 have not been developed, but it is anticipated that the toll rates per mile will be similar to the toll rates on the Triangle Expressway.

TABLE 3: ESTIMATED CAPITAL COSTS COVERED BY TOLL REVENUE				
	R-2721	R-2828	R-2829	Total
	(NC 55 Bypass – US 401)	(US 401 – I-40)	(I-40 – US 64/264 Bypass)	(Complete 540)
Capital Costs (\$)				
Construction	300,100,000	465,300,000	439,200,000	1,204,600,000
Right of Way and Relocation	83,500,000	69,000,000	79,800,000	232,300,000
Utilities	21,800,000	30,800,000	1,700,000	54,300,000
Total Construction	405,400,000	565,100,000	520,700,000	1,491,200,000
Roadway Maintenance (\$)				
NPV Roadway Maintenance	35,100,000	34,710,000	42,120,000	111,930,000
Revenue (\$)				
NPV Gross Revenue (Less Toll Collection Costs)	356,370,000	397,490,000	382,360,000	1,136,220,000
Cost of Revenue Financing	89,092,500	99,372,500	95,590,000	284,055,000
NPV Net Revenue (Less Toll Collection, Roadway Maintenance, and Financing)	232,177,500	263,407,500	244,650,000	740,235,000
Percent of Capital Costs Covered by Toll Revenue (Less Toll Collection, Roadway Maintenance, and Financing)	57%	47%	47%	50%

3) Confirm traffic forecasts and projected time savings

Two primary purposes have been established for the Complete 540 project, based on general transportation problems in the Raleigh area and specific, more localized needs. The first purpose is to improve mobility within or through the study area during peak travel periods. The second purpose is to reduce forecast congestion on the existing roadway network within the project study area.

A secondary purpose of the project is to improve system linkage in the regional roadway network by completing the 540 outer loop around the greater Raleigh area—a goal that has been sought by area planners for more than 40 years. It is expected that construction of this remaining 540 link would benefit local commuters living south and east of Raleigh as well as motorists making longer trips through the Triangle Region to and from points south and east.

Travel time savings to users of the Complete 540 project who are traveling to and from various destinations, assuming the project is entirely open to I-495/US 64-264, is located in the *Alternatives Development and Analysis Report (May 2014)* in Appendix A.

Based on the *Alternatives Development and Analysis Report (May 2014)*, Complete 540 meets the primary purposes of the project by improving transportation mobility and reducing congestion while also improving system linkage in southern and eastern Wake County. When Complete 540 in the 2035 PM peak period is compared to the No-Build, average speeds on major roadways in the study area increase by 5.7% and travel times from RTP and Brier Creek to Fuquay-Varina, Garner, Clayton and Knightdale decrease by an average of 11.5 to 13.7%. When Complete 540 in 2035 is compared to the No-Build, total daily vehicle hours traveled (VHT) decrease by 3.47%, PM peak period congested vehicle miles traveled decrease by 26%, and PM peak period congested VHT decrease by 30%. These reductions in travel times are shown in **Figures 1 and 2** attached to this memo.

An environmental impact statement (EIS) is being prepared in order to comply with the National Environmental Policy Act (NEPA). The EIS is being prepared for the completion of the 540 loop around Raleigh – the portions west of I-40 and the portions east of I-40. Therefore, the travel time information prepared to date is for the entire project for use in the EIS study process. Information regarding travel time savings and projected number of users “if the portions west of I-40 were completed several years sooner than the eastern portion” was not developed.

Information regarding traffic levels and projected travel times if the Complete 540 project were not built is located in the *Complete 540 – Triangle Expressway Southeast Extension Traffic Forecast (April 2014)* and *Alternatives Development and Analysis Report (May 2014)* in Appendix A.

Regarding socio-economic and land use changes, the Complete 540 project team is engaged in ongoing coordination with agency stakeholders to ensure the project is being completed in a timely and environmentally sensitive manner. The Indirect and Cumulative Effects study will examine and incorporate the appropriate socio-economic and land use information with and without Complete 540 Preferred Alternative.

4) Examine potential for scaling the project to reduce environmental impacts.

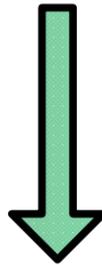
The development of a major highway on new location in an urbanizing area requires balancing of the design/construction/operation of the highway and impacts to the human and natural environment. Impact avoidance and minimization are the first considerations of initial design and subsequent design refinement. Although complete avoidance of resources is not possible, alignments for each color-coded segment that make up the 17 DSAs were adjusted to avoid and minimize impacts to sensitive resources. The study team met on multiple occasions with the environmental resource and regulatory agencies to review the Complete 540 project. As a result, further refinement in the form of alignment modifications and bridging changes were made to each DSA. These refinements further minimized impacts to streams and wetlands before generating data upon which the DSAs were compared and documented in the Draft EIS.

Once a Preferred Alternative has been selected, there will be additional opportunity for impact minimization. Such minimization often includes a closer examination of the design “footprint” in areas of important resources to see if it can be further reduced. NCDOT and the resource and regulatory agencies will continue to examine strategies for minimizing impacts. This collaborative effort will foster opportunities for the development of innovative ideas for reducing impact, which can be incorporated into the final design. Mitigation plans will be developed for impacts that remain after avoidance and minimization.

The Capital Area Metropolitan Planning Organization requested that NCDOT and NCTA develop the entire Complete 540 project in accordance with the Metropolitan Transportation Plan. The project is included in the STIP as three projects (R-2721, R-2828, and R-2829) and is planned for three implementation phases. This phased approach for construction will spread out costs and as well as the impacts. Additionally the financial implications of this phased approach will be evaluated in the traffic and revenue study for the project.

Legend

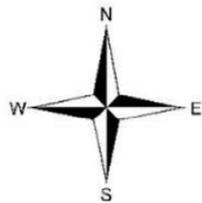
Origin



Destination

AM (PM)
XX (XX) = Travel Time (min)

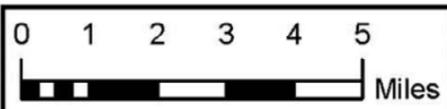
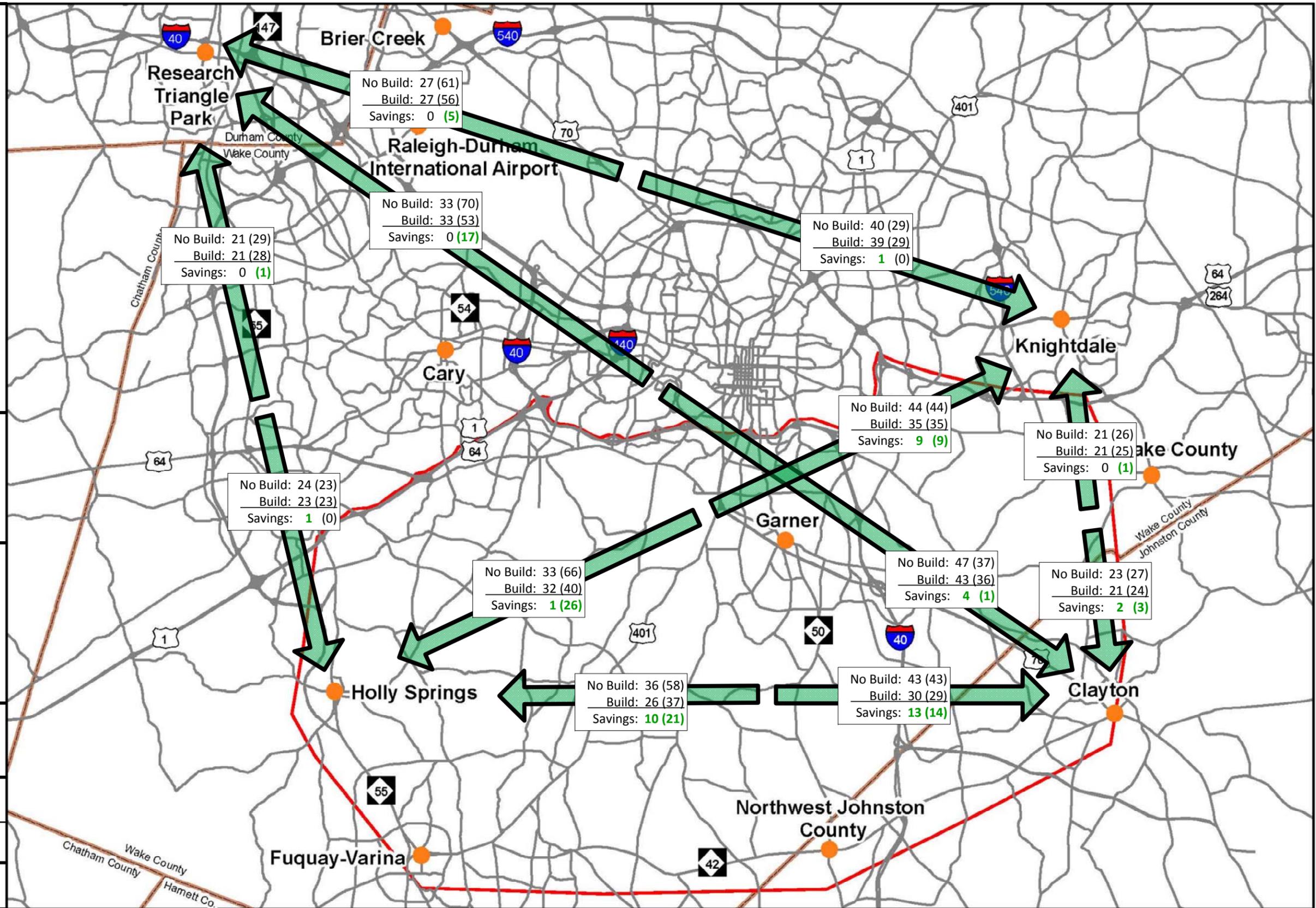
**NCDOT STIP R-2721,
R-2828, R-2829**
Complete 540



2035 Travel Time Savings

STIP #: R-2721, R-2828, R-2829	COUNTY: Wake
DATE: March 2016	DIVISION: 5

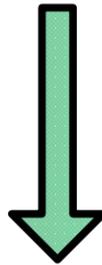
Figure 1



*Source: Southeast Extension – First Tier Screening Traffic Memorandum, HNTB, June 8, 2011

Legend

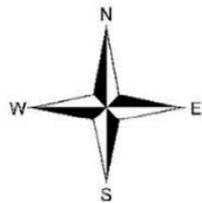
Origin



Destination

AM (PM)
XX (XX) = Travel Time (min)

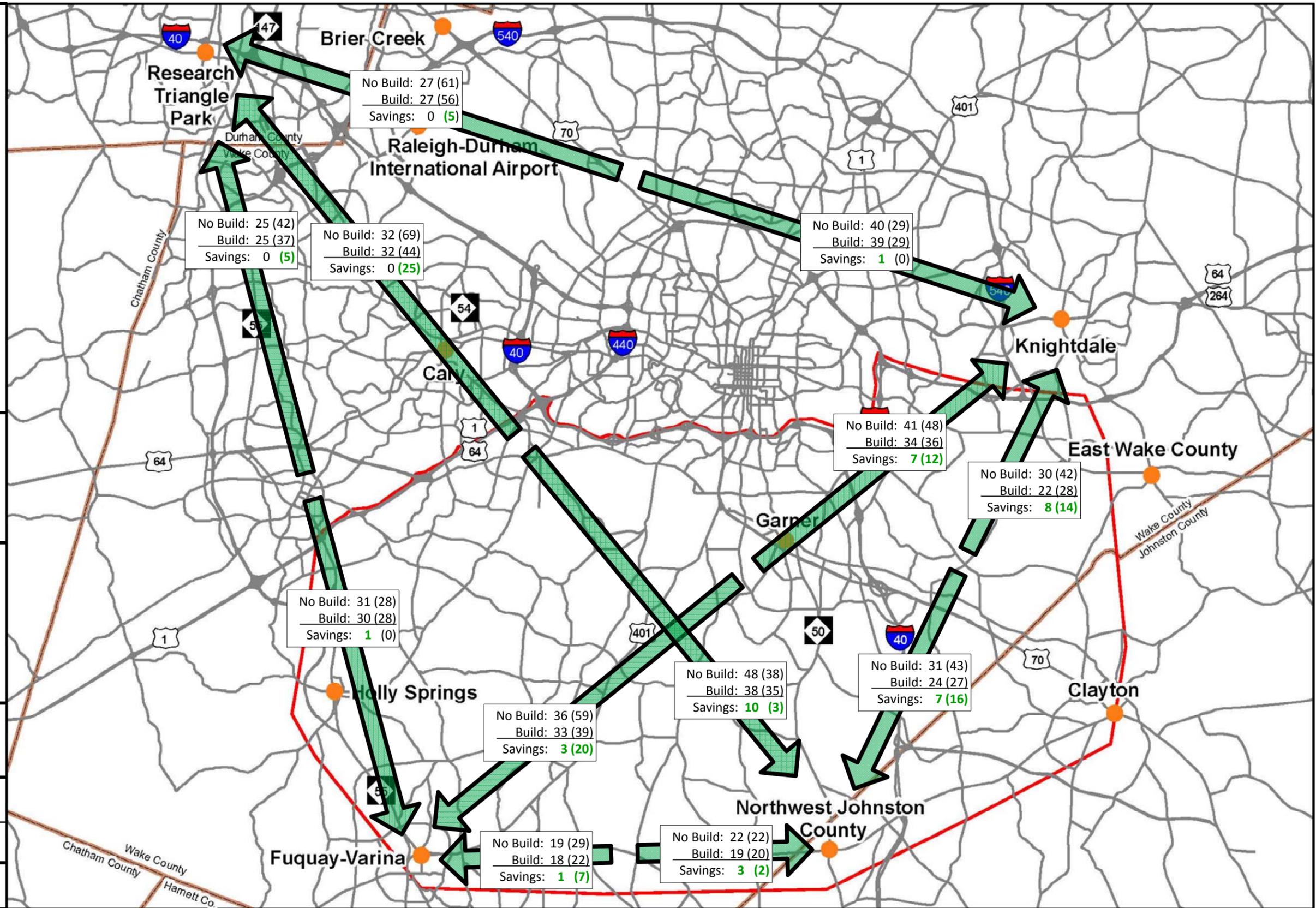
**NCDOT STIP R-2721,
R-2828, R-2829**
Complete 540



2035 Travel Time Savings

STIP #: R-2721, R-2828, R-2829	COUNTY: Wake
DATE: March 2016	DIVISION: 5

Figure 2



*Source: Southeast Extension – First Tier Screening Traffic Memorandum, HNTB, June 8, 2011