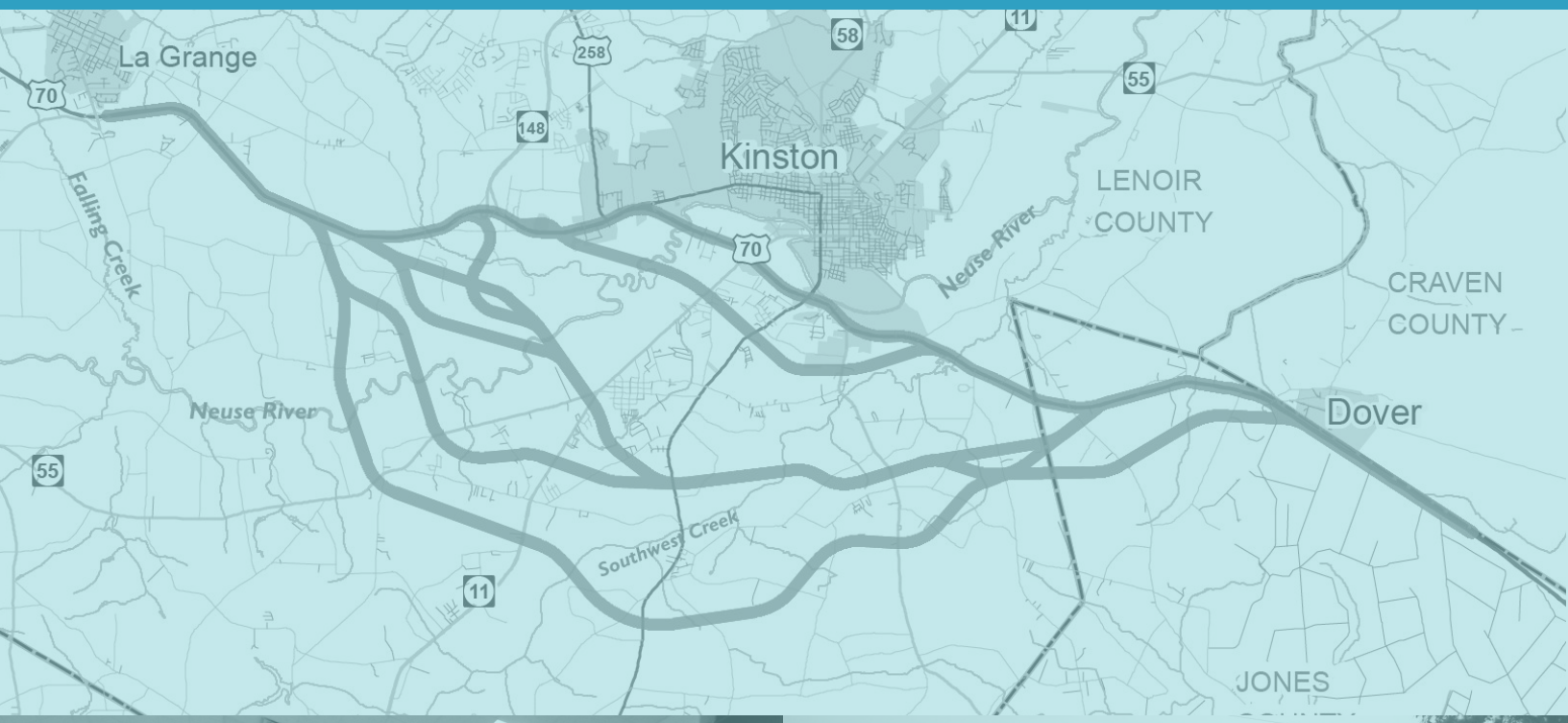
KINSTON BYPASS 70

STIP Project Number R—2553

Economic Impact Assessment



North Carolina Department of Transportation

March 2018
(Updated July 2019)

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Acronyms and Abbreviations

ADT	Average daily traffic
CIA	Community Impact Assessment
DCIA	Direct community impact area
ECUBBR	East Carolina University Bureau of Business Research
EIA	Economic Impact Assessment
GTP	Global TransPark
IMPLAN	Modeling software used for this analysis
INFRA	Infrastructure for Rebuilding America
LUSA	Land Use Scenario Assessment
mph	Miles per hour
NASS	National Agricultural Statistics Service
NCDOT	North Carolina Department of Transportation (NCDOT)
NPV	Net present value
OSBM	Office of State Budget and Management
STIP	State Transportation Improvement Program
TIGER	Transportation Investment Generating Economic Recovery
US	United States
USDOT	United States Department of Transportation
VHT	Vehicle hours traveled
VMT	Vehicle miles traveled

EXECUTIVE SUMMARY

Executive Summary

PROJECT

The North Carolina Department of Transportation (NCDOT) is proposing the Kinston Bypass (State Transportation Improvement Program [STIP] R-2553), a four-lane, median-divided freeway with full control of access in Lenoir, Jones, and Craven counties in North Carolina. The project extends from United States (US) Highway 70 (US 70) near La Grange (in Lenoir County) to US 70 near Dover (at the Jones and Craven county line). The project is a component of the US 70 corridor between Raleigh and Morehead City, which is identified as Corridor P in the state's comprehensive Strategic Transportation Corridors Policy, which has the stated corridor goals of improving regional mobility, system connectivity, and economic prosperity.

STUDY PURPOSE AND METHODOLOGY

As part of NCDOT environmental compliance for the project, an Economic Impact Assessment (EIA) was completed in early 2016 to assess the project's potential future economic impact on the local economy. The key components of that EIA included highway user impact analysis (e.g., travel time, safety); business inventory; market assessment; IMPLAN analysis[1]; and public outreach. Subsequent to that, an updated 2018 EIA has been performed to re-assess and, where necessary, re-analyze the project's economic impacts based on new project information and/or changes to the project study area or the proposed project.

ALTERNATIVES

The 2016 EIA analyzed a future No-Build Alternative and three build alternatives as follows:

- Upgrade Existing US 70 (Alternative 1UE)
- Upgrade Existing US 70 with Shallow Bypass (Alternative 1SB)
- Southern Bypass (Alternative 51)

The three build alternatives were selected as representative alternatives of the 12 detailed study alternatives under consideration for the project.

The 2018 EIA analyzes the same alternatives. Since completion of the 2016 EIA, the traffic modeling analysis for the project has been updated and its findings have been incorporated in the 2018 EIA. In addition, more detailed facility design and route planning has also subsequently been completed. Its analysis and findings have also been incorporated in the 2018 EIA.

[1] IMPLAN is an economic input-output modelling analysis commonly used to estimate the "multiplier effects" of project-related future changes in spending and employment. The multiplier effects include both (1) indirect economic impacts from project spending on labor, goods or services and (2) induced economic impacts of spending by employees and support businesses.

EXISTING CONDITIONS

The 2018 EIA project study area consists predominantly of Lenoir County, but also includes small portions of Jones and Craven counties. For the last several decades Lenoir County has performed poorly economically compared to its neighboring counties and North Carolina as a whole. Population growth, employment growth, educational attainment, and income all lag below the state averages. Over the next 20 years, negligible changes in Lenoir County's population are projected to occur as reported in Table A-1 of Appendix A (OSBM 2017.B, OSBM 2017.C).

IMPACTS ANALYZED

The 2018 EIA projects and/or qualitatively evaluates the following highway user or wider social benefits for project-related impacts:

- **Travel time savings**: Reduced congestion and improved travel conditions will reduce highway and local road users' travel times.
- **Safety benefits**: Fewer accidents are expected as accident rates for controlled access highways are significantly lower than those on non-controlled access highways.
- **Fuel savings**: Improved travel conditions will reduce vehicle fuel use resulting in direct travel cost savings for highway users.
- **Vehicle miles traveled (VMT) costs**: Alternatives that require longer driving distance will have an increase in costs due to fuel, insurance, and vehicle depreciation.
- **Improved reliability**: Future trip times will be more predictable, enabling highway users to reduce "buffer time" allowances and reduce their total trip time.
- **Business profitability**: Transportation cost savings (e.g., reduced travel times and costs) will improve businesses' profitability and improved regional accessibility will extend businesses' market area reach and labor force catchment area. Both factors would positively affect local businesses' sales opportunities and production costs.
- **Retail sector - sales shift impacts:** Future highway access changes may result in some retail and service sales to be reallocated among local businesses or "leak" out of the county. Some land use changes and business relocation (or new development) can be expected as a result (e.g., at interchanges).
- **Impacts to existing businesses by highway route and accessibility changes:** New highway development and routing may displace, encroach, and/or require building changes for some existing properties and businesses. While property owners will be adequately compensated for any project-related impacts to their properties, there could nonetheless be net impacts to Lenoir County's economy. Highway access changes (travel distance, travel time, and/or visibility) may also positively or adversely affect existing and future local businesses' performance.
- **Potential net business development impacts by improved highway accessibility:** Improved highway accessibility may improve the region's future economic development

(e.g., new business growth at Global TransPark's and downtown Kinston's revitalization efforts).

- **Indirect and induced impacts:** Changes in local business activity (e.g., from sales shift impacts or other new business development) will have multiplier effects, resulting in indirect and induced employment and output impacts from its employees and supporting businesses.

SUMMARY OF FINDINGS

Many of the build alternatives' potential economic benefits cannot be quantified. The current traffic modeling does not provide information to determine the future improvements in travel time reliability. Another important consideration is that there is insufficient data to estimate the comparably higher economic costs for Alternative 1UE (both from business interruption during construction and business displacement/relocation).

In cases where the project's impacts are less direct (e.g., profitability benefits from larger market and labor catchment areas), it is also difficult to determine the specific contribution that can be attributed to project-related effects. Similarly, the project's potential future economic development benefits would also be dependent on other contributing factors (e.g., city planning, capital availability).

The economic impacts and benefits for the build alternatives are summarized as follows:

- **Alternative 1UE**. Alternative 1UE would continue to focus future retail development along the existing US 70 corridor. However, the new controlled access highway would reduce access to businesses not located at the future interchange locations. Some existing businesses may be displaced or face encroachment as a result of Alternative 1UE's expanded right-of-way access and new frontage roads.

  Based on its sales shift, average daily traffic growth, vehicle hours traveled, vehicle miles traveled (VMT), and safety benefits, Alternative 1UE is projected to result in total net benefits of $20.6 million in 2040. Between 2025 and 2044, the net present value of Alternative 1UE's cumulative net benefits is estimated to total $66.2 million.

- **Alternative 1SB**. Alternative 1SB would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately three quarters of a mile south of the existing US 70 in Kinston. Any travelers interested in stopping would be expected to divert before the bypass and travel along the existing US 70 route. In addition, it is likely that new infill commercial development may be attracted to the interchanges as a secondary focus for future retail development. Alternative 1SB is projected to result in a net positive impact on Lenoir County.

  Based on its sales shift, average daily traffic growth, vehicle hours traveled, VMT, and safety benefits, Alternative 1SB is projected to result in total net benefits of $21.5 million in 2040. Between 2025 and 2044, the net present value of Alternative 1SB's cumulative net benefits is estimated to total $177.2 million.

  Alternative 51. Alternative 51 would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately 4 or 5 miles south of the existing US 70 in Kinston. However, any travelers interested in stopping would be expected to divert before

the bypass and travel along the existing US 70 route. The lack of any nearby existing (or likely future) residential or commercial development and supporting utilities would also limit the local market support for any new businesses located at its interchanges. Alternative 51 would provide the least overall net economic benefit for Lenoir County since there would be no notable connectivity between its interchanges and US 70 existing retail clusters.

Based on its sales shift, average daily traffic growth, vehicle hours traveled, VMT, and safety benefits, Alternative 51 is projected to result in total net benefits of $8.0 million in 2040. Between 2025 and 2044, the net present value of Alternative 51's cumulative estimated net benefit loss is $14.7 million.

Furthermore, the 2018 EIA conservatively assumes that under the 2040 no-build baseline conditions, future retail business growth would not be negatively impacted despite its projected worsening future travel conditions.

Highway Users

It is difficult to precisely and fully determine each project alternative's total net benefits. However, as Table ES 1 shows, the project would be expected to result in time savings and safety benefits for future roadway users. There would also be more limited user benefits resulting from the project's increased service capacity with only comparatively minor travel cost increases for future roadway users of Alternatives 1SB and 51 due to the slightly greater distance of their route. Although not quantified, these two alternatives would result in the highest reliability benefits since the existing US 70 roadway would remain as an alternate secondary route for roadway users during any future highway delays or closures (e.g., due to congestion or accidents).

Table ES 1: Summary of economic impacts to highway users by DSA (2016 $; $ millions)

Impacts	Alternative 1UE	Alternative 1SB	Alternative 51
Travel Time Savings (2040)	$17.5	$13.1	$8.0
Travel Cost (2040)	$0	($1.2)	($3.2)
Safety Benefit (2040)	$20.5	$15.2	$11.4
User Capacity Benefit (2040)	$1.7	$1.2	$4.2
Reliability	Improved	Best – provides alternate route during delays	
Total User Benefits (2040)	$39.7	$28.3	$20.4

Source: NCDOT 2018f.

Local Economy

Table ES 2 summarizes the project's expected impacts on the region's businesses and economy. The DSAs would result in a variety of economic benefits for the Lenoir County economy. The proposed action's primary purpose is to improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the North Carolina STC policy (NCDOT 2015c). Mitigation measures to businesses would be explored after selection of the applicant's preferred alternative.

While the project's benefits to the region's businesses and economic development cannot be quantified, the project may be expected nonetheless to improve most of its businesses' competitiveness, profitability, and development potential. These impacts would include potential for increased revenues from improved market access and/or cost savings from reduced transportation costs and expanded labor/supplier catchment area.

Table ES 2: Summary of economic impacts to regional businesses by DSA (2016 $; $ millions)

Impacts	Alternative 1UE	Alternative 1SB	Alternative 51
Business profitability	Improved financial performance and competitiveness ▪ Increased market area ▪ Lower delivery costs ▪ Expanded labor and supplier catchment area		
Market growth	No local market growth assumed under all DSAs Limited retail sales/business growth from increased future pass-through traffic		
Business development	Non-retail growth supported by improved US 70 travel conditions and enhanced businesses' competitiveness.		
	Retail growth focused on future US 70 interchanges.	Retail growth focused on future US 70 interchanges with infill development and US 70 growth also possible.	Minimal net retail growth. Very limited interchange and infill development due to poor amenities and negligible nearby market. US 70 growth also possible.

Source: NCDOT 2018f.

The No-Build Alternative's potential adverse conditions and impact on the region's businesses and economy similarly cannot be determined and quantified. It was also conservatively assumed that there would be no adverse impacts on the region's businesses and economy despite an expected deterioration in future travel conditions if the project is not built. Nonetheless, it might reasonably be expected that future non-retail growth could be potentially be constrained by worsened US 70 travel conditions. Similarly, future retail growth could also be limited by degraded US 70 traffic conditions and would remain limited along US 70. It was conservatively projected that in 2040 up to $277.4 million in future retail and service sales growth would occur under the No-Build Alternative. This increase is expected to be primarily the result of future non-local highway users' spending growth since the area's stagnant population and absence of increased highway traffic growth by local residents are expected to ensure that local residents' retail and service sales would remain unchanged.

Business Impacts

Table ES 3 summarizes the project's expected impacts on the region's existing businesses and potential future retail sales shift impacts. Sales shift impacts represent the projected net changes to the retail and service business sectors that otherwise may be "lost" or transferred to other businesses outside the market area under the DSAs compared to the No-Build Alternative.

Table ES 3: Summary of US 70 business impacts by DSA (2016 $; $ millions)

Impacts	Alternative 1UE	Alternative 1SB	Alternative 51
US 70 land use and access	US 70 businesses access restricted by interchanges. Potential encroachment and site access changes.	No access changes for existing US 70 businesses. Improved US 70 travel conditions.	
Construction (short-term)	Comparable increased local spending and employment during project construction. Not included as an economic benefit for impact analysis.		
	Major disruption to US 70 use and businesses.	Minor disruption to US 70 use and businesses.	
Retail sales growth (2040)	$258.4m	$270.7m	$265.5m
Sales shift [a] from No Build (2040)	Growth change (2040): ■ Sales: -$19.1m ■ Jobs: -128 ■ Output: -$8.0m	Growth change (2040): ■ Sales: -$6.7m ■ Jobs: -45 ■ Output: -$2.8m	Growth change (2040): ■ Sales: -$11.9m ■ Jobs: -80 ■ Output: -$5.0m
Other existing businesses	Up to 270 ac farmland impacted and <$0.1m net revenue loss.	Up to 464 ac farmland impacted and $0.15m net revenue loss.	Up to 743 ac farmland impacted and $0.24m net revenue loss.

m = million

Source: NCDOT 2018f.

As shown in Table ES 3, the EIA estimated that the project's potential future retail sales shifts could range from a $6.7 million decrease in the region's future highway related retail sales growth (Alternative 1SB) up to a $19.1 million decrease (Alternative 1UE). These future retail sales shift impacts are relatively minor as they would range from approximately 2.4 percent to 6.9 percent of the future highway related retail sales growth projected under the No-Build Alternative. Furthermore, successful marketing, planning, and other development efforts could result in other new business growth and/or retention that could readily offset the projected potential sales shift impacts. In addition, the DSAs may encourage business growth and/or retention as a result of increased non-local highway users, improved business productivity, and/or improved traffic conditions on the existing US 70 roadway (under Alternatives 1SB and 51). In contrast to Alternative 1UE, Alternatives 1SB and 51 would have only limited access and property impacts on the existing US 70 businesses and have greater potential and likelihood of new business development and/or relocations at its interchanges. Due to its relative proximity to the existing US 70 roadway, Alternative 1SB has the best potential for encouraging future infill development along its arterial connections to the existing US 70 roadway and businesses.

Business Relocations

The impacted businesses are identified by the R-2553 Relocation Report (NCDOT 2017). The Relocation Report can be found on the project website. Impacts to any displaced businesses (which may be distinct from the landowners who will be financially compensated) would consist of their lost future net earnings potential (i.e., revenues minus business costs). However, except for the one-time relocation cost, the displaced businesses would probably not incur any long-term net earnings losses if other comparable relocation sites were available nearby. Given the availability of underused and developable land sites in Lenoir County (as defined in the LUSA), it would be reasonable to expect that future business relocations should be possible to reduce the future displacement impacts. The LUSA can be found on the project website.

Relocation Report

The Relocation Report for the Kinston Bypass can be found on the project website.

https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx

Land Use Scenario Assessment (LUSA)

The LUSA for the Kinston Bypass can be found on the project website.

https://www.ncdot.gov/projects/kinston-bypass/Pages/default.aspx

Table ES 4 shows the estimated average annual sales and employment associated with the businesses that would be relocated under each DSA. The impacted businesses were also separated into two groups – highway market dependent and other businesses. The highway market dependent group consisted of lodging, food and beverage, entertainment, and retail businesses. This includes businesses such as lodging, fuel stations, fast food restaurants, and convenience stores that obtain a major proportion of their sales from non-local highway users, and therefore proximity and easy access from the highway are important for their success. The remaining businesses were aggregated as other businesses. While these other businesses may rely on the highway for their customers, employees, and suppliers to access their facility, their sales are not predominantly obtained from in-transit highway users making unplanned stops and/or purchase decisions.

The values shown in Table ES 4 provide a highly conservative estimate of the businesses that would require relocation to alternate sites with highway access since it does not differentiate those businesses that provide goods and service for non-local customers travelling through Kinston. If there is an insufficient supply of suitable highway-accessible sites then some displaced highway market dependent businesses may leave the area, which can increase the future "sales leakage" out of the local economy. This would represent a negative economic impact for both the permanently displaced businesses and potentially for the local economy (if the sales leakage cannot be served and captured by other local businesses). The economic impact could also be more long-term if the site availability constraints persist and are not corrected through planning, rezoning, or other means.

Table ES 4: Business relocation impacts by DSA (2016 $; $ millions)

	Alternative 1UE	Alternative 1SB	Alternative 51
Total Business Relocations	**137**	**66**	**26**
Highway Market Dependent	69	31	12
Other Businesses	68	35	14
Total Sales ($ Millions/year)	**$150**	**$49**	**$16**
Highway Market Dependent	$82	$25	$11
Other Businesses	$68	$24	$5
Total Jobs	**1,158**	**349**	**178**
Highway Market Dependent	652	188	127
Other Businesses	506	161	51

Source: NCDOT 2017; AECOM 2018.

Non-highway market dependent businesses will have a greater selection of alternative relocation sites and generally will be far less liable to long-term adverse sales or business impacts from the relocation. The economic impacts for specific business from relocation may also differ depending on the condition of their current property. Businesses and/or landowners of outmoded buildings may benefit from an opportunity to revitalize their businesses.

As a result, while it is difficult to project individual business decisions, it is the overall net economic outcomes that are most relevant to the EIA. No net loss to the local economy would occur if an existing business's lost sales and jobs are subsequently recaptured by other existing businesses or new ventures.

Short-term Impacts

The EIA also found that project-related construction would have short-term economic benefits in local employment and spending. However, these benefits are not included in the EIA as an additional benefit of the DSAs compared to the No-Build Alternative. This was primarily a conservative assumption so as not to overly favor future roadway development based on the project's ability to secure construction spending that would result in only temporary economic gains for Lenoir County. In addition, due to the similarity of the alternatives' construction cost estimates, potential cost savings is not considered an important consideration for weighting the EIA results. As a result, the alternatives' construction costs are not included in the EIA estimates of the alternatives' economic benefits.

Conclusion

It should be recognized that the EIA could not identify or estimate any site-specific impacts for Alternative 1UE. It is expected that US 70's current major retail clusters would remain accessible to highway users. Although Alternative 1UE's route would be unchanged, direct access to most businesses would be prohibited as highway users would only be able to enter/exit at the interchange locations. Finally, the EIA does not include the short-term adverse economic impacts on the US 70 businesses from construction-related disruption and congestion that would not occur under Alternatives 1SB and 51.

While the magnitude and value of the various potential site-specific impacts could not be determined at this stage of planning, altogether the short-term and long-term site-specific impacts could potentially exceed Alternative 1UE's projected net benefits. The potential for the site-specific impacts to offset Alternative 1UE's projected benefits will be greater if Lenoir County continues to experience low to no economic growth in the future.

Under both Alternatives 1SB and 51, US 70's current major retail clusters would be expected to still remain readily accessible to highway users as their existing businesses and access would be unchanged. Alternative 1SB would also allow and may attract future new infill development at its interchanges.

From both a narrower economic perspective of the project's quantified benefits (i.e., VHT, VMT, ADT growth, and safety benefits) and a wider analysis that includes its qualitative benefits and unquantified costs, Alternative 1SB is considered and recommended as the most economically beneficial project alternative for Lenoir County over the long term. Numerous key factors differentiate Alternative 1SB from Alternative 1UE.

- Alternative 1SB will not result in any significant physical impacts on US 70's existing businesses from encroachment or redesign of the local street system.
- Significantly greater (although temporary) business interruption impacts can be expected from Alternative 1UE.
- Alternative 1UE would require major reconfiguration of the local roadway system (including new frontage roads and property access points). Given its greater development and site constraints, the requirements and costs for the supporting infrastructure may be expected to be higher than for the other build alternatives. As a result, this will likely result not only additional project costs but also property and access changes to existing US 70 businesses that would be avoided under Alternative 1SB and Alternative 51.
- Alternative 1SB would have more limited physical impacts on the businesses within its footprint and offer greater economic development growth potential for both the existing US 70 business corridor and those sites with good access to its future interchanges. These findings are consistent with the general consensus from the public outreach efforts, which overall reported a preference for Alternative 1SB.

CHAPTER 1
PROJECT BACKGROUND

1. PROJECT BACKGROUND

The North Carolina Department of Transportation (NCDOT) is proposing the Kinston Bypass (State Transportation Improvement Program [STIP] R-2553), a four-lane, median-divided freeway with full control of access in Lenoir, Jones, and Craven counties in North Carolina. The project extends from United States (US) Highway 70 (US 70) near La Grange (in Lenoir County) to US 70 near Dover (at the Jones and Craven county line). The project is a component of the US 70 corridor between Raleigh and Morehead City, which is identified as Corridor P in the state's comprehensive Strategic Transportation Corridors Policy, which has the stated corridor goals of improving regional mobility, system connectivity, and economic prosperity.

As part of NCDOT environmental compliance for the project, an Economic Impact Assessment (EIA) was completed in early 2016 to assess the project's potential future economic impact on the local economy. The key components of the EIA included highway user impact analysis (e.g., travel time, safety); business inventory; market assessment; IMPLAN analysis[2]; and public outreach. Subsequent to that, an updated 2018 EIA has been performed to re-assess and re-analyze the project's economic impacts based on new project information and/or changes to the project study area or the proposed project.

The EIA project alternatives and analysis methodologies are discussed below.

1.1 2016 KINSTON BYPASS EIA

The purpose of the 2016 EIA was to evaluate the base and future year no-build and build economic conditions for the Kinston Bypass project. The study documented the existing economic conditions in the project study area and estimated expected future-year economic conditions for a no-build scenario and compared that information to those conditions under the three proposed bypass Alternatives 1UE, 1SB, and 51. The EIA assessed the project impacts to both the wider Lenoir County economy and more specifically on the businesses located along existing US 70 or the alternative bypass routes.

The 2016 EIA analysis used the findings of the *Kinston Bypass Traffic Simulation Report* (URS 2013) to estimate the expected future 2040 travel time and travel cost savings for users of the proposed Kinston Bypass alternatives. The *Kinston Bypass Traffic Simulation Report*'s traffic projections were also used for the safety benefit analysis and the qualitative analysis of business productivity.

Finally, a summary comparison of the project alternatives was completed to help decision-makers and stakeholders better understand the comparative economic consequences of the four study alternatives (No-Build, Upgrade Existing US 70 [Alternative 1UE], Upgrade Existing US 70 with Shallow Bypass [Alternative 1SB], and Southern Bypass [Alternative 51]). Findings from the study were intended to be used with the other technical studies for the Draft

[2] IMPLAN is an economic input-output modelling analysis commonly used to estimate the "multiplier effects" of project-related future changes in spending and employment. The multiplier effects includes both (1) indirect economic impacts from project spending on labor, goods or services and (2) induced economic impacts of spending by employees and support businesses.

Environmental Impact Statement to assist in the selection of the least environmentally damaging practicable alternative.

1.2 2018 KINSTON BYPASS EIA

The purpose of this current document is to update and re-evaluate the previous EIA's analysis as necessary based on the interim changes in baseline conditions, methodologies, or input data that might be expected to result in any significant changes to the EIA's previous findings. While there have been no changes to the proposed alternatives that are being analyzed, more detailed information on the project's physical impacts and traffic operations has been completed and incorporated in the 2018 EIA analysis.

Most of the 2016 EIA data and analysis remains valid due to the short time since the EIA was finalized and the fact that Lenoir County's economy and social conditions are relatively unchanged. However, new economic and demographic data are available, and new and more detailed traffic forecasts and environmental impact analysis results have been completed and incorporated into the updated EIA's re-evaluation. Table 1-1 provides an overview comparison between the 2016 EIA and the 2018 EIA. The comparison between the 2016 and the 2018 EIA analyses provides a high-level summary of the most important changes and updates in the 2018 EIA. Most notable are the changes in the impact analysis due to new traffic data.

Overall, the 2018 EIA provides an analysis focused on the data, approach, impacts, and findings that differ significantly from the previous EIA. Consequently, the updated EIA's general approach is as follows:

- Briefly summarize the corresponding information presented in the EIA to provide sufficient context to understand the specific topic.
- Identify any relevant changes in the data, approach, or impacts that contribute to significant new analysis results and/or findings.
- Present the necessary explanatory data and analysis for the significantly different factors or issues.
- Revise the EIA economic impact findings resulting from new factors/issues where necessary.
- Incorporate updated traffic data and location information.

Table 1-1: Comparison between 2016 and 2018 EIA analyses

EIA 2016				EIA 2018		
Section		**Purpose**	**Summary of Findings**	**Changes**	**Study Implications**	**Study Updates**
1. Background/Approach						
1.1	Project Overview	Operational Context	NA	No change	No change	NA
1.2	Study Purpose	Objectives of analysis	NA	No change	No change	NA
1.3	Environmental Documentation	Related NEPA and other analyses	NA	No change	No change	NA
1.4	Purpose and Need	Primary planning needs and purposes	NA	No change	No change	NA
1.5	Proposed Modifications	Design criteria for alternatives	NA	No change	No change	NA
1.6	Overview of Project Alternatives	Description of alternatives analyzed	NA	Additional design detail on alternatives	Revised traffic, land use, and accessibility data	Updated impact analysis on highway use, land use, and accessibility
1.7	Literature Review and Research	Background research	NA	No change	No change	NA
1.8	Methodology	Description of analysis approach	NA	No methodology changes but additional information available	More detailed analysis of some impacts	Supplemental analysis added when appropriate

EIA 2016				EIA 2018		
Section		Purpose	Summary of Findings	Changes	Study Implications	Study Updates
2. Existing Conditions						
2.1	Project Study Area	Description of the study area's current socioeconomic conditions	NA	More recent socioeconomic data for some factors	Minor changes to existing conditions	Key data tables updated in Appendix A
2.2	Public Outreach	Results from public outreach	NA	Additional public meetings held	Supplemental stakeholder information	New information incorporated into analysis
2.3	Current Traffic Conditions	US 70 trips, travel time, and accident data	NA	Revised data on 2015 traffic conditions	Revised baseline conditions	New data used for impact analysis
3. Market Analysis						
3.1	Key Market Analysis Concepts	Discussion of concepts and terminology	pages 20 - 21	No change	No change	NA
3.2	Key Factors Determining Market Relationships / Effects	Identification of key factors and relationships	pages 22 - 24	No change	No change	NA
3.3	Business Inventory	Description of businesses and market dependence on US 70	pages 24 - 28	Limited local business changes (including 2016 flood)	Minor change to business sectors (including retail)	New information incorporated in analysis

EIA 2016				EIA 2018		
Section		Purpose	Summary of Findings	Changes	Study Implications	Study Updates
3.4	Market Assessment	Identified key market trends and growth projection. Estimated sales origin, capture rates, and average spending	pages 28 - 33	Updated baseline traffic and retail conditions	Revised sales shift impacts to retail businesses	Revised analysis and impact findings
3.5	Impacts to Existing Retail Businesses	Projected impacts to existing retail businesses	pages 33 - 37	Updated future traffic and retail sales projections	Revised land use and accessibility impacts	Revised analysis and impact findings
3.6	Future Sales Shift Projections	Projected 2040 sales shifts from alternatives implementation	pages 38 - 43	Updated future traffic and retail sales projections	Revised sales shift impacts to retail businesses	Revised analysis and impact findings
4. Impact Analysis						
4.1	Travel Time Savings	Economic value of reduced roadway user travel times estimated	pages 45 - 46	Updated baseline and future traffic projections	Revised travel time impacts	Revised analysis and impact findings
4.2	Safety Benefits	Economic value of improved highway safety estimated	pages 46 - 49	Updated baseline and future traffic projections	Revised safety impacts	Revised analysis and impact findings
4.3	Other Highway User Benefits	Fuel savings and reliability benefits qualitatively evaluated	pages 49 - 50	Updated baseline and future traffic projections	Previous qualitative analysis updated	Minor changes to previous qualitative analysis

EIA 2016				EIA 2018		
Section		Purpose	Summary of Findings	Changes	Study Implications	Study Updates
4.4	Business Profitability	Revenue and operating cost impacts to business sector assessed qualitatively	pages 50 - 51	Updated baseline and future traffic projections	Limited changes to previous non-retail businesses impacts	Minor changes to previous qualitative analysis
4.5	Impacts to Existing Businesses	Alternative specific analysis of impacts to current non-retail businesses (especially agriculture)	pages 51 - 54	Updated design, LUSA, and relocation information	Additional land use/accessibility information	Revised analysis and impact findings
4.6	Net Business Development Impacts	Potential overall future business sector growth/losses (including sales shifts) assessed	pages 55 - 57	Updated design, baseline, and future traffic projections	Previous qualitative analysis updated	Revised analysis and impact findings
5. Indirect and Induced Impacts						
5.1	IMPLAN	Discussion of IMPLAN methodology and multipliers	pages 58 - 59	NA	No change	NA
5.2	Sales Shift Related Indirect and Induced Impacts	IMPLAN analysis of projected sales shift impacts by alternative	pages 59 - 61	Updated IMPLAN modeling	Changes in projected indirect and induced impacts	Findings updated

EIA 2016				EIA 2018		
Section		Purpose	Summary of Findings	Changes	Study Implications	Study Updates
5.3	Potential Future Economic Development Scenarios	Assessment of projected future economic development scenarios and alternatives	pages 61 - 65	No change in economic development projections	No change	NA
6. Summary of Findings						
6.1	Project Benefits	Project benefits	pages 65 - 67	Based on revisions to individual impacts	Updated	Findings updated
6.2	Adverse Project Impacts	Adverse project impacts	pages 67 - 68	Based on revisions to individual impacts	Updated	Findings updated
6.3	Net Benefits	Net benefits	pages 68 - 70	Based on revisions to individual impacts	Updated	Findings updated
7. References						

1.3 OVERVIEW OF PROJECT ALTERNATIVES

US 70, as it currently exists in the project study area, is a four-lane highway with varying levels of access control (see Figure 1-1). As the highway passes through southern Kinston, there is no control of access, with multiple signalized intersections and major at-grade crossings causing a high degree of congestion on the highway. The Kinston Bypass project is aimed at alleviating this congestion by upgrading the highway to allow for full control of access.

Twelve build alternatives are currently being evaluated for the Kinston Bypass project that range from 21.2 miles to 25.3 miles in length, all with a design speed of 70 miles per hour (mph). A total of 12 build alternatives are currently under consideration, which include southern bypass alternatives, as well as Alternative 1UE. The No-Build Alternative and three build alternatives of different upgrade/bypass improvements analyzed by the 2018 EIA are unchanged from the 2016 EIA. More specifically, the four alternatives analyzed are as follows:

- No-Build (US 70 to remain the same)
- Upgrade Existing US 70 (Alternative 1UE)
- Upgrade Existing US 70 with Shallow Bypass (Alternative 1SB)
- Southern Bypass (Alternative 51)

Figure 1-1 shows the locations of the alternatives.

1.4 METHODOLOGY

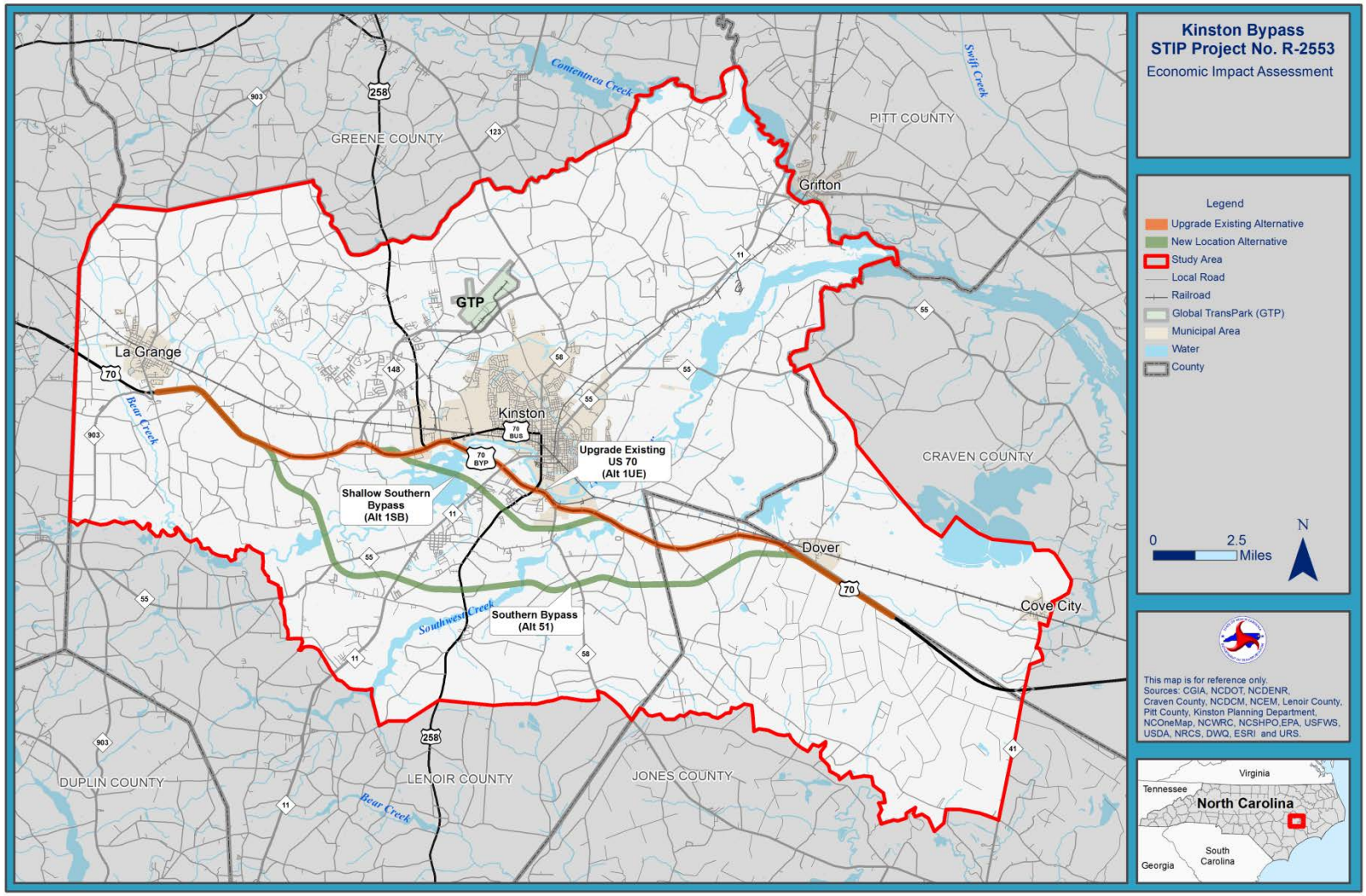
1.4.1 General Methodology

The EIA identified and assessed the project study area's current socioeconomic, market, and traffic conditions. Indicators such as population growth, age, employment, educational attainment, and wage levels were evaluated for the socioeconomic analysis. The socioeconomic conditions were also compared with neighboring counties to understand the socioeconomic factors specific to Kinston/Lenoir County and those common to the greater eastern North Carolina region.

The EIA also inventoried and assessed the businesses located within a quarter mile of US 70 and the proposed routes for Alternatives 1SB and 51. Finally, current traffic volume data and travel condition information was used to estimate the local economic activity generated by US 70 businesses.

The 2016 EIA relied on 2012 and 2040 (future) traffic conditions from the *Kinston Bypass Traffic Simulation report* (URS 2010). However, new traffic modeling for the project was completed in 2017. The new traffic analysis provides data on 2015 and updated 2040 traffic conditions, including estimated daily traffic volumes, vehicle miles traveled (VMT), average speeds, travel time savings, and accident rates.

Figure 1-1: Three alternatives analyzed in the 2018 EIA



While the traffic studies, Land Use Scenario Assessment (LUSA), and Community Impact Assessment (CIA) only analyze 2015 and 2040 conditions, the EIA period of analysis is 2025 to 2044 to conservatively estimate the total expected economic benefits of the alternatives. This is a conservative estimate since a new roadway's useful operational life may be expected to extend past 2045. The EIA also estimates and reports 2040 benefit values to facilitate cross-comparisons with other studies. Annual traffic data were extrapolated between 2025 and 2039 based on the 2015 and 2040 traffic modeling results. Traffic use after 2040 was conservatively estimated to remain at 2040 levels.

1.4.2 Economic Analysis

The 2018 EIA used updated values for economic analysis from the US Department of Transportation (USDOT) *Benefit-Cost Analysis Guidance for TIGER and INFRA Applications* (USDOT 2017), which pulls from the 2014 Resource Guide (USDOT 2014). These included operating costs, accidents, and travel time savings. All values are in 2016 dollars.

National vehicle operating costs, omitting tolls, driver wages, and fixed/transfer costs, were as follows:

- $0.40/car mile
- $0.96/truck mile

The national monetized value of accidents is as follows:

- $3,200 if no injury
- $174,000 with an injury of unknown severity
- $9.6 million for a fatality

National values of travel time savings, depending on the type of occupant, were as follows:

- $13.60 per hour for local personal travel (50 percent of the median household income expressed in hourly terms)
- $13.60 per hour for business commuters as their work commutes are assumed to be local personal travel that occurs "off the clock"
- $27.20 per hour for truck drivers
- $19.00 per hour for out of town "through traffic" (70 percent of the median household income expressed in hourly terms)

The average per capita incomes for North Carolina and Lenoir County residents are 90 and 75 percent of US average per capita income, respectively (American Community Survey 2017 C). While this might suggest that North Carolina and Lenoir County residents might have a correspondingly lower economic value for their travel times, USDOT guidance recommends that "it [is] inappropriate to use different income levels or sources for different categories of traveler. Neither the incomes associated with published research nor the stability of the relationship between income and VTTS (vehicle travel time savings) are certain enough to imply that fine adjustments would yield more realistic estimates…The scale of income levels developed here is applicable nationwide, and analysts should not attempt to substitute incomes for particular modes

or locations" (USDOT 2014). Consequently the 2018 EIA applies standard (and unadjusted) user travel time values for its travel time benefit analysis. However, use of lower unit values of the user travel time values would generally reduce the estimated benefits for any reductions in vehicle travel times and the benefits of any additional vehicle use from the alternatives' increased service capacity.

1.4.3 IMPLAN

IMPLAN input-output modeling was used to estimate the direct, indirect, and induced effects of project-related economic spending changes to the region's economy. IMPLAN's input-output model represents the relationships and linkages between different economic sectors through its multipliers and thereby projects how increased or decreased spending would affect the regional economy.

The model uses these multipliers to estimate the direct, indirect, and induced impacts of the initial change in economic activity. Direct effects measure the industry changes directly due to the project; indirect impacts measure the changes that occur through its supply chain effects; and induced effects measure changes in local spending from the wage effects to the business's (and supplier businesses') employees. The total impact multiplier represents the combined multiplier impact for the direct, indirect, and induced impacts.

CHAPTER 2
EXISTING CONDITIONS

2. EXISTING CONDITIONS

2.1 PROJECT STUDY AREA

The EIA project study area consists predominantly of Lenoir County (see Figure 1-1). Short sections of the build alternatives extend into portions of Craven and Jones counties, which are only sparsely populated or unpopulated areas. All of the economic activity that would potentially be directly affected by the project alternatives is within Lenoir County and is predominately located within the City of Kinston. Consequently, the EIA focuses on analyzing the economic impacts to Lenoir County and the City of Kinston.

The City of Kinston's and Lenoir County's economies were characterized and their strengths and weaknesses evaluated based on the findings of the existing conditions. Kinston is the predominant community and economic center in Lenoir County. Consequently, unless specifically noted otherwise, the observations or impacts determined for either Lenoir County or Kinston are equally applicable for both the City of Kinston and Lenoir County.

Most of the 2016 EIA's existing conditions data and analysis remain valid due to the short time since the EIA was previously finalized and Lenoir County's relatively unchanged economy and social conditions. Nonetheless, updated economic and demographic data are provided in Appendix A with a brief explanatory text.

Generally, there has been little overall change in the project study area's economy or population since the EIA analysis period in 2015. However, flooding from the 2016 Hurricane Matthew resulted in nearly a two-week closure of US 70 in Kinston and many businesses along US 70 experienced significant flood damages to their properties, inventories, and operations. While most of the affected businesses have recovered from the flood event, a few businesses remain closed (most notably the River Motel) as their properties have been to date irreparable. Appendix A provides additional information on the existing conditions.

Although there has been little change to the businesses located along US 70, Kinston's downtown has experienced numerous new business openings and redevelopments of several previously unoccupied buildings. As a result, it is becoming a significant new commercial area and focus for new economic investment and development. The downtown area's revitalization is predominantly focused on new restaurant, retail, and lodging businesses. For example, new lodging businesses have been recently opened by Kinston's successful Chef & the Farmer Restaurant (the O'Neil Hotel) and Mother Earth Brewing Company (Mother Earth Motor Lodge). Numerous other new restaurant and retail businesses have also been attracted to the area as it has become increasingly established as an attractive and successful commercial destination.

While the downtown's ongoing revitalization is a promising development for Kinston, the size and extent of the business activity to date remains limited from a citywide or county perspective. Consequently, the new downtown business growth has not significantly altered Kinston's baseline economic and business sector conditions.

In the absence of any significant observable changes to the project study area's existing conditions at either the city-wide level or local level (i.e., from Hurricane Matthew or downtown

revitalization), it was determined that no economic re-analysis was warranted based on any recent changes in the project study area's exiting conditions.

2.2 CURRENT TRAFFIC CONDITIONS

US 70 through Lenoir County is a four-lane highway with varying degrees of access control (the urban section includes a continuous turn lane while the rural section has partially controlled access). The highway passes through southern Kinston and has multiple signalized intersections and major at-grade crossings. The speed limit for US 70 users ranges from 45 mph to 70 mph with slower speed required in the city limits. The signalized intersections and lack of total access control prevents users from reaching posted speeds, with an average speed between 51 and 55 mph throughout the entire 19.0 mile section (6.55 miles are classified as urban and 12.45 miles are classified as rural).

US 70 serves key industries and economic sectors, connecting Raleigh, the Global TransPark (GTP), and the Port of Morehead City, and provides connectivity to I-95. As such, the corridor is heavily used for freight movement. Current day travel times from GTP to Raleigh, the GTP to the Port of Morehead City, and the Port of Morehead City to Raleigh are 91, 88, and 152 minutes respectively (Cambridge Systematics 2014).

In 2015, the average daily trips (ADT) consisted of 44,000 vehicles, which required 7,100 hours to travel 377,000 miles per day. Seventy percent of total trips are assumed to be local, an average of 6.9 miles in length. This compares to the average trip of 8.5 miles in length, lasting 9.7 minutes with a total of 1.7 minutes of delay per vehicle.

While 70 percent of all trips are assumed to be local, this value includes commuter, truck, and personal trips. Table 2-1 combines the out of town and local trips for both trucks and commuters while keeping the different personal trips separate: 32 percent of traffic is assumed to be locals performing personal trips, with 13 percent of trips assumed to be personal trips made by people from out of town traveling to Kinston or passing through Lenoir County ("through traffic") to other locations.

Table 2-1: Occupancy and composite of vehicle type for No-Build Alternative

Vehicle Type	2015 Vehicle Composite	Occupancy
Truck	15%	1
Commuter	43%	1.24
Personal – local	30%	1.57
Personal – through traffic	13%	1.57
Total /Average	100%	1.35

Sources: AECOM 2017; USDOT 2015 auto (small and medium)

Values are rounded and may not add up to 100 percent

Table 2-1 includes expected occupancy. Most vehicles are expected to have more than one person in them, with only 15 percent assumed to be trucks with occupancy of one person.

The US 70 section through Kinston consists of a rural four-lane divided highway with no control of access, and an urban four-lane divided facility with no control of access or with a continuous left turn lane.

An analysis of traffic accidents occurring along US 70 from SR 1603 (East Washington Street) on the west side of Kinston to SR 1005 (Dover Road) to the east of Kinston shows a total of 1,101 accidents with seven fatalities occurring between 2013 and 2015 (Table 2-2). For more information, see the *Crash Analysis Summary* report (AECOM 2018).

Table 2-2: US 70 Kinston accident rates for uncontrolled roads (October 1, 2012-September 30, 2017)

Accidents	US 70 Kinston Total Accidents			US 70 Kinston Accidents per 100 million VMT		National Accidents per 100 million VMT	
	Rural	Urban	Total	Rural	Urban	Rural	Urban
Fatal	4	3	7	0.89	1.26	0.76	0.99
Injury	169	213	382	38	90	24	90
No injury	397	316	713	88	133	62	215
Total	570	532	1,102	127	224	87	306

Source: AECOM 2018

VMT – vehicle miles traveled

Road safety is generally considered based on the number of fatalities, injuries, and non-injury accidents per 100 million VMT. The national fatality averages (for similar road type) of 0.76 and 0.99 per 100 million VMT for rural and urban areas, respectively, were lower than that of Kinston (0.89 and 1.26 per 100 million VMT for rural and urban areas, respectively). The national accidents with injury averages were similar or lower (24 and 90 per 100 million VMT for rural and urban areas, respectively, compared to Kinston (38 and 90 per 100 million VMT for rural and urban areas, respectively). In urban areas, the national accident with no injury average was higher than Kinston (215 and 133 per 100 million VMT, respectively), while the rural rates were lower for the national average (62 and 88 per 100 million VMT for national and Kinston, respectively).

2.3 EXISTING BUSINESS INVENTORY

2.3.1 General

The 2016 EIA used numerous data sources to evaluate both from a citywide perspective and specific to the areas in close proximity to US 70 and the proposed alternative routes. The business inventory identified the location and proximity of businesses to the US 70 corridor, employment size, industry classification, sales volume, and square-footage for 2013 to 2014 conditions.

The 2018 EIA obtained 2017 InfoUSA data, which were compared for consistency with the 2013 to 2014 ReferenceUSA information. Only minor differences were identified in the inventory.

Additional research was conducted to identify recent changes in the local business community. Kinston's major business employers are unchanged and generally provide a comparable number of jobs for the local county. These findings are also consistent with the general observation that there has been little change to Kinston's economy over this time period.

It was therefore determined that no economic re-analysis was warranted to account for any recent changes in Kinston's business sector economy.

Highway market dependent businesses consist of retail and service businesses who obtain a major share of their business from non-local customers on a less planned or impulse basis. This is distinct from other businesses, which also rely on US 70 for customer access but are more destinational for locals (or non-locals).

For example, gas stations and many fast food restaurants generally obtain a major share of their sales from impulse or as needed purchases. In such cases, convenience is likely a major factor in customer's decisions to stop and make purchases. This is especially true for non-local highway users that are unfamiliar with the area and en route to their final destination. Local highway users familiar with the area and/or closer destinations have more options for their purchasing decisions. In addition, highway market dependent businesses typically are non-destinational businesses selling standard goods or services undifferentiated from those available at other similar businesses. Consequently, customers' stopping and purchasing decisions are more impulsive and largely based on convenience rather than other considerations (e.g., selection, price, and service). As a result, highway market dependent businesses typically include businesses that obtain a major share of their sales from non-local customers and everyday goods (food, fuel, and sundries).

However, car dealerships are not identified as highway market dependent as their business performance is not primarily or intrinsically based on highway accessibility. While specific car dealerships may be considered highway reliant businesses that benefit from good highway access and visibility, car purchases are rarely impulse purchases made en route. In addition, the dealership's goods are differentiated from its competitors. Consequently, customers will plan and make their purchasing decisions predominantly based on other factors (e.g., selection, price, and service) rather than the convenience of its location to their journey.

The major highway market dependent businesses on US 70 largely consist of four business sectors. These sectors and their corresponding current IMPLAN sector classification are Sector 400: Retail - Food and beverage stores (grocery stores or mini-marts); Sector 402: Retail - Gasoline stores; Sector 405: Retail - General merchandise stores (e.g., Walmart); and Sector 502: Food services and drinking places (restaurants).

Table 2-3 shows the primary clusters of highway market dependent businesses along US 70. These are clustered at four key intersections: Hill Farm Road/Sussex Street and US 70, NC 11/55 and US 70, US 258 S (South Queen Street) and US 70, and NC 58 and US 70. In addition, other notable highway dependent businesses (e.g., Neuse Sports Shop and Kings BBQ) are located between these intersections.

Table 2-3: Highway dependent businesses along US 70

Hill Farm Road/Sussex Street and US 70	NC 11/55 and US 70
Lowe's	Fuel Warehouse
Wendy's	Auto Pro
Applebee's	Sunoco Gas/Minimart
Chick-fil-A	Bojangles
Murphy Express Gas	Dollar General
Golden Corral	**US 258 S (South Queen Street) and US 70**
Holiday Inn Express	Hardee's
Kinston Premiere Theatre 7	Hampton Inn
McDonalds	Quality Inn
Hwy 55 Burgers, Shakes & Fries	**US 58 and US 70**
Aldi	McDonalds
Walmart	Kangaroo Gas
Hardee's	Lenoir Community College
Arby's	KF Mart Gas
Subway	

2.3.2 Retail Sector

The 2016 EIA developed estimates of local versus non-local sales and potential average purchases per stop. Average per capita spending for relevant categories of retail and service were applied to county retail sales data to derive estimates of local and non-local sales by retail and service sectors. Business inventory data were used to allocate retail sales totals for the corresponding retail and service businesses in the US 70 corridor. Available traffic data and estimates of trip types, volumes, and stopping rates were used with professional judgement to develop a low, medium, and high range of capture rates and spending assumptions to represent the highway-dependent sales in the US 70 corridor.

The capture rate and spending assumptions were developed for use by sales shift analysis and represent average of aggregate effects across categories of retail sectors and trip types. As such, they are subsequently used to project and compare the overall net retail effects among the alternatives. However, they are not intended to serve as specific estimates or direct representation of retail spending behavior. These provide, in effect, a combined weighted average that may be very different from the typical most common trip by highway users. Furthermore, while based on highway-dependent business, the spending estimates likely apply more broadly to include spending effects for other related retailers (e.g., highway reliant businesses due to their predominantly local customer base such as grocery stores) and local customers not necessarily counted as US 70 trips (e.g., interchange or side road trips). In any case, the traffic, capture rate and spending assumptions provide reasonable estimates for comparative analysis among the alternatives of their overall net retail effects

Table 2-4 shows the 2016 EIA mid-value estimates used in the 2018 EIA. Vehicle types considered included trucks, commuters, locals on personal trips, and non-local traffic on personal trips. The trucks and commuters are assumed to be a mix of local and non-local trips.

Table 2-4: Vehicle type, capture rate, and assumed spending per stop

Trip Type	Proportion of ADT	Capture Rate	Spend per Stop	Stops (1,000/year)
Truck	15%	5%	$135	121
Commuter	42.5%	30%	$44	2,058
Non-Work (local)	30%	50%	$40	2,401
Non-Work (non-local)	12.5%	20%	$60	412
Total / Average	100%	31% [a]	$59 [a]	4,992

Sources: AECOM 2017; ECUBBR 2015.

[a] Weighted average value by vehicle type and all values are rounded.

Trucks were assumed to have very low capture rates but have a higher spend per stop. Commuters were projected to be a mix of local and through trips. As a result, they were estimated to have a higher spend per stop than non-work through traffic but lower capture rate than non-work local traffic.

Note that sales per retail stop could occur at more than one business (e.g., the purchase of both gasoline and fast food) and the estimate represents sales for all the vehicle occupants. Consequently, the non-local per-car spending estimates are considered reasonable given that the typical cost for a full tank refill would be $35 to $40 (based on a 13 gallon capacity and $2.70 to $3 per gallon fuel price). In addition to these and other sundry purchases, a portion of highway users might also be expected make larger expenditures (e.g., groceries, sporting goods, and/or auto repairs) that would increase the per stop average.

CHAPTER 3
IMPACT ANALYSIS

3. IMPACT ANALYSIS

As discussed in Chapter 1, the 2018 EIA uses the same methodologies for its impact analysis as the EIA unless specifically noted otherwise.

In accordance with standard economic impact analysis practice, each build alternative's projected net economic impacts are estimated based on its projected benefit minus the benefits that would otherwise be achieved under the No-Build Alternative.

The project's expected future benefits are discussed and/or analyzed by category of impact and are quantified and monetized when possible.

Benefits are calculated for two different groups: the number of vehicles expected for the no-build option (Base) and system capacity benefits from ADT growth from building the upgrade for each alternative (Growth). As some alternatives are slightly longer than the No-Build Alternative (Alternative 1SB and Alternative 51 are 1.1 and 3.0 percent longer, respectively), the related additional VMT and VHT are included with the Base comparison.

It is assumed vehicle trips served by the alternatives would otherwise either not occur or would consist of trips re-routed from other roadways. This analysis applies "the rule of halves" and assumes a 50/50 split between the two options. Consequently, only 50 percent of these trips' total benefit amount (e.g., 50 percent of the total cost of the trip and 50 percent of the improved safety and travel time benefits) are attributed as project-related benefits.

3.1 VEHICLE MILES TRAVELED AND AVERAGE DAILY TRIPS

The 2018 EIA was conducted utilizing traffic data from the *Traffic Capacity Analysis* (AECOM 2017). Values were modeled in 2015 and 2040; vehicle hours are conservatively assumed to not change after 2040. Values between 2015 and 2040 were extrapolated. Future ADT values were calculated using these values and are further explained below.

The updated VMT and ADT values for the 2018 EIA differ from the 2016 EIA due to updated modeling. The daily traffic volumes in the latest traffic forecast are generally slightly less than those from the previous traffic forecast that was prepared for this project within a 10 percent change (Parsons Brinckerhoff 2016). Table 3-1 includes projected VMT per day by alternative in 2025 and 2044.

Table 3-1: Projected Daily VMT

Alternative	VMT/Day			
	2015	2025	2035/Average	2044
No Build	377,300	481,000	585,000	637,000
Alternative 1UE	-	494,000	599,000	652,000
Alternative 1SB	-	494,000	601,000	654,000
Alternative 51	-	508,000	632,000	694,000

Source: AECOM 2017

Note: Values rounded.

As discussed in Section 1.4.1, the traffic studies, LUSA, and CIA analyze 2015 and 2040 conditions. However, the EIA period of analysis is 2025 to 2044, which conservatively assumes a 20-year lifespan for the proposed new bypass facilities. This provides a more comprehensive estimate of the alternatives' total expected economic benefits. This is a conservative estimate of the project's economic benefits since the proposed bypass facilities' useful operational life may be expected to extend past 2045. Nonetheless, the EIA also estimated and reports 2040 benefit values to facilitate cross-comparisons with other studies.

Traffic on the No-Build Alternative is expected to increase from its current level of 377,000 VMT per day to between 585,000 (No-Build Alternative) and 632,000 (Alternative 51) VMT per day in 2035. The increased VMT is due to non-local traffic increases.

Total VMT is expected to increase on the build alternatives partly due to minor increases in the roadway lengths (1.1 and 3.0 percent for Alternative 1SB and Alternative 51, respectively). However, the majority of the build alternatives' VMT growth would result from the projected increases in their future traffic volumes per the 2017 *Traffic Capacity Analysis* (AECOM 2017). In 2044, Alternative 51 is projected to result in the highest total growth (58,800 daily VMT), followed by Alternative 1SB and Alternative 1UE (17,600, and 15,300 additional VMT per day respectively). System growth from additional trips would be between 9,900 additional daily VMT (Alternative 1SB) up to 30,400 additional daily VMT (Alternative 51).

The traffic growth is expected to result predominantly from increased non-local trips as the Lenoir County future population is projected to remain unchanged between 2015 and 2040 as discussed in Chapter 2. However, due to its location, Alternative 51 is also projected to induce a significant number of new trips by local residents traveling out of the county. The traffic analysis estimates that induced local trips accounts for almost 3 percent of total trips and 60 percent of VMT growth from the No-Build Alternative. While these induced local trips are included in the system growth analysis, they are not expected to impact sales shift and so are excluded.

ADT values in Table 3-2 are calculated based on the following assumptions: locals travel 70 percent of the No-Build Alternative VMT in 2015 (264,100 VMT/day for locals) and have an average commute length of 6.9 miles (38,300 ADT). This ADT value is assumed to stay constant through the life of the project. All other trips are assumed to travel the length of the alternative. Alternatives 1UE and 1SB use the same assumptions. Alternative 51 assumes that the additional induced trips by local users travel the length of the alternative to out of region destinations. The induced local trips are discussed further in Section 3.5.2 and are not expected to result in any sales impacts.

Table 3-2: Projected ADT

Alternative	Trip Type	2025	2035/Average	2044
No Build	Local	38,300	38,300	38,300
	Non-Local	11,400	16,900	19,600
	Total	**49,700**	**55,100**	**57,900**
Alternative 1UE	Locals	38,300	38,300	38,300
	Non-Local	12,100	17,600	20,400
	Total	**50,400**	**55,900**	**58,700**
Alternative 1SB	Locals	38,300	38,300	38,300
	Non-Local	12,000	17,500	20,300
	US 70 Route	*28,500*	*29,100*	*29,400*
	Bypass Route	*21,700*	*26,700*	*29,200*
	Total	**50,300**	**55,800**	**58,600**
Alternative 51	Local	38,300	38,300	38,300
	Non-Local [a]	12,400	18,800	22,000
	US 70 Route	*26,600*	*28,700*	*29,700*
	Bypass Route	*24,100*	*28,400*	*30,500*
	Total	**50,700**	**57,100**	**60,200**

Source: AECOM 2017

Note: Values rounded and may not sum exactly.

[a] Includes induced local trips to out of region destinations. For the retail sales shift analysis, this ADT value was reduced to match Alternative 1SB as shown in Table 3-11.

As previously discussed, benefits are calculated for two different groups: (1) the vehicle trips expected under the No-Build Alternative (Base) and (2) additional trip growth served by the build alternatives (Growth). This analysis discounts future benefits back to 2016 dollars (assuming no inflation) applied both a 3 and 7 percent discount rates. The EIA reports the cumulative project benefits on a present value basis using the 3 percent discount rate. This is commonly applied as a more representative governmental opportunity cost of capital than a 7 percent discount rate, which better represents the private sector's opportunity cost of capital.

Alternative 1UE is the same total length as the No-Build Alternative, so it has no additional costs (negative benefits) as shown in Table 3-3, whereas Alternative 1SB and Alternative 51 have an increase in the weighted total length (1.1 and 3 percent, respectively), resulting in an expected slight decrease in their comparative VMT benefits over the 20 year period (−$13 million and −$34 million, respectively, at a 3 percent discount rate).

Table 3-3: Total economic value of VMT benefits (2025–2044) (2016 $; $ millions)

Net VMT Benefits	Alternative 1UE	Alternative 1SB	Alternative 51
VMT Base (= No-Build Conditions)			
2040	$0	($1.2)	($3.2)
Total 2025-2044	$0	($22.0)	($58.9)
3% Discount Rate	$0	($12.7)	($34.1)
7% Discount Rate	$0	($6.5)	($17.6)
VMT Growth (> No-Build Conditions)			
2040	$0.7	$0.5	$1.7
Total 2025-2044	$12.8	$8.6	$25.2
3% Discount Rate	$7.5	$5.0	$14.0
7% Discount Rate	$3.9	$2.6	$6.8
VMT Total			
2040	$0.7	($0.7)	($1.5)
Total 2025-2044	$12.8	($13.4)	($33.7)
3% Discount Rate	$7.5	($7.7)	($20.1)
7% Discount Rate	$3.9	($4.0)	($10.8)

Source: AECOM 2017; US Department of Transportation 2015.

Note: Values rounded and may not sum exactly.

Alternative 51 has the greatest projected VMT growth and therefore results in the largest increase in VMT benefits of $14 million (using a 3 percent discount rate) for the Growth vehicle trips over the 20-year study period.

Alternative 1UE is projected to result in the largest total travel mile savings of $7.5 million (using a 3 percent discount rate) over the 20-year study period.

3.2 TRAVEL TIME SAVINGS

The 2018 EIA uses the updated 2017 traffic modeling analysis performed for the project (AECOM 2017). As previously discussed, higher travel speeds are projected under the build alternatives as a result of their controlled access and absence of signaled intersections. Currently, traffic congestion has limited impact on travel speeds except during peak periods (i.e., from beach traffic during summer weekends). Consequently, the project's vehicle travel time savings are estimated on a daily basis as opposed to focusing solely on the peak travel time periods as the project would also result in travel time savings for highway users during non-peak periods.

The build alternatives are projected to generally operate under free flow conditions with 65 mph average speeds. Future travel conditions along US 70 are conservatively projected to remain relatively unchanged between the No-Build and build alternatives. Values were modeled in 2015 and 2040; vehicle hours are conservatively assumed to not change after 2040. Values between 2015 and 2040 were extrapolated.

Table 3-4 includes projected VHT per day by alternative in 2025 and 2044. Conservatively assuming a 20-year project operating lifespan (2025 to 2044), the average occurs in 2035. Traffic on the No-Build Alternative is expected to increase from its current levels of 7,100 VHT per day to between 9,200 (Alternative 1UE) and 11,000 (No-Build Alternative) VHT per day in 2035. The increased VHT is due to non-local traffic increases as can be seen with the VHT Base and VHT Growth values.

Table 3-4: Projected daily VHT

Alternative	VHT/Day			
	2015	2025	2035/Average	2044
VHT Base (= No-Build Conditions)				
No Build	7,100	9,000	11,000	11,900
Alternative 1UE	-	7,400	9,000	9,800
Alternative 1SB	-	7,900	9,500	10,300
Alternative 51	-	8,300	10,100	11,000
VHT Growth (> No-Build Conditions)				
No Build	0	0	0	0
Alternative 1UE	-	210	230	240
Alternative 1SB	-	130	160	170
Alternative 51	-	200	500	640
VHT Total				
No Build	7,100	9,000	11,000	11,900
Alternative 1UE	-	7,600	9,200	10,000
Alternative 1SB	-	8,000	9,700	10,500
Alternative 51	-	8,500	10,600	11,600

Source: AECOM 2017.

Note: Values rounded and may not sum exactly.

Table 3-5 shows the projected average travel time, travel speeds, and net travel time savings for each project alternative. There are three primary trip types for the alternatives: local vehicles that travel primarily on the US 70 route (for an average of 6.9 miles per trip); through traffic traveling solely on the US 70 route (for an average of 19 miles per trip); and through traffic using the bypass (for an average of 19.2 to 20.2 miles depending on the alternative). Table 3-5 shows the resulting average travel metrics by alternative.[3]

[3] These trip types are applied on an aggregate basis for the purposes of the impact analysis. For example, a non-local user stopping in Kinston and continuing out of the region corresponds to a non-local through trip solely using US 70. Consequently, they do not represent the specific individual vehicle trip patterns.

Table 3-5: Average travel distance, time, and net time savings (2040)

Alternative	Average Distance (Miles)	Average Travel Time (minutes)	Average Net Travel Time Savings (minutes)	Average Speed (mph)
No Build	11.0	12.4	0	53
Alternative 1UE	11.1	10.3	2.2	65
Alternative 1SB	11.2	10.8	1.6	62
Alternative 51	11.5	11.6	0.8	59

Source: AECOM 2017

Under the No-Build Alternative, the average travel speed (53 mph) is less than 65 mph primarily due to roadway's uncontrolled access and stoplights. Alternative 1UE would be entirely controlled access with average travel speeds of 65 mph. However, Alternatives 1SB and 51 would have controlled access along their bypass segments (and US 70's adjoining eastern and western sections). Travel speeds for vehicles on these roadways are expected to average 65 mph. However, the US 70 segment in Kinston would not be upgraded and therefore its users would travel at a lower speed that would be more comparable to the No-Build travel conditions. As a result, the overall average speeds for all vehicles under Alternatives 1SB and 51 would be 62 and 59 mph, respectively.

The estimated total travel time savings for the 2025 to 2044 study period were calculated using the 2025 (conservatively expected project completion date) and 2040 future travel conditions projections from the 2017 traffic modeling analysis.

Future growth in vehicle trips was assumed to occur steadily. The project's travel time benefits were based on the 2040 travel conditions since quantified future traffic condition projections for earlier years were unavailable. This is a conservative assumption since travel time improvements during the early years after the bypass's completion would likely be greater than the 2040 travel conditions, which will have higher roadway use and congestion.

The economic benefits of the project's future travel time savings are based on total VHT (Base versus Growth), occupancy values (ranging from 1 to 1.57 occupants per vehicle), and trip type. No change in total non-work local trips is expected, with growth expected to occur from non-work through traffic, commuter, and truck traffic. The proportion of US 70's future vehicle trips by truck and commuters were assumed to remain unchanged (Table 3-6) since there is a lack of available information to predict future changes in regional economic development and travel patterns with sufficient confidence to increase or decrease the proportions of future US 70 traffic by truck and commuters.

Table 3-6: Trip types by alternative (2040)

Trip Type	No Build (2015)	No Build	Alternative 1UE	Alternative 1SB	Alternative 51
Truck	15%	15%	15%	15%	15%
Commuter	42.5%	42.5%	42.5%	42.5%	42.5%
Non-Work (Local)	30%	17.6%	17.2%	17.2%	16.2%
Non-Work (Non-Local)	12.5%	24.9%	25.3%	25.3%	26.3%
Total	100%	100%	100%	100%	100%

Source: AECOM 2017.

Values are rounded and may not sum exactly.

The project's future travel time savings benefits were estimated for both the Base highway trips (i.e., trips that would use US 70 under the No-Build Alternative) and the projected bypass-related trip growth (i.e., new additional highway trips).

Table 3-7 shows the projected travel time savings for both the future Base and Growth trip groups. Alternative 1UE has the highest travel speeds for all users and therefore results in the greatest future travel time savings. Over the 2025 to 2044 study period, the travel time savings for the Base vehicle trips (i.e., versus No-Build) were estimated to total $182 million (at a 3 percent discount rate). The travel time savings for the Growth trips were also estimated and are shown in Table 3-7. The total travel time savings benefits for each alternative are also shown in Table 3-7.

Table 3-7: Total travel time savings benefits (2025–2044) (2016 $; $ millions)

Net VHT Benefits	Alternative 1UE	Alternative 1SB	Alternative 51
VHT Base (= No-Build Conditions)			
2040	$17.5	$13.1	$8.0
Total (2025-2044)	$315.6	$233.1	$140.3
3% Discount Rate	$182.3	$134.4	$80.8
7% Discount Rate	$93.7	$69.0	$41.3
VHT Growth (> No-Build Conditions)			
2040	$0.6	$0.4	$1.5
Total (2025-2044)	$11.9	$7.9	$22.1
3% Discount Rate	$6.9	$4.6	$12.3
7% Discount Rate	$3.6	$2.4	$6.0
Total VHT			
2040	$18.2	$13.5	$9.5
Total (2025-2044)	$327.5	$241.0	$162.4
3% Discount Rate	$189.2	$139.0	$93.0
7% Discount Rate	$97.3	$71.3	$47.3

Source: AECOM 2017; US Department of Transportation 2015.

Note: Values rounded and may not sum exactly.

Alternative 51 has the highest projected increase in new additional vehicle trips and therefore results in the greatest travel time savings benefits for the Growth vehicle trips. Over the 20-year study period, Alternative 51's future travel time benefits are projected to total $12 million (using a 3 percent discount rate).

Alternative 1UE is projected to result in the largest total travel time savings of $189 million (using a 3 percent discount rate) over the 20-year study period.

3.3 SAFETY BENEFITS

Accident rates for controlled access highways are significantly lower than those on non-controlled access highways. Consequently, the build alternatives would result in travel safety benefits (i.e., fewer accidents) to the degree that they re-route future vehicle trips from non-controlled access roads (primarily the existing US 70) to safer controlled access roadways.

As discussed in Section 2.2, accident rates on US 70 are significantly higher than the statewide averages for similar roadways (4 or more lanes divided with no control of access) (AECOM 2018). Between 2013 and 2015, US 70 crash rates in Lenoir County averaged 0.89 and 1.26 per 100 million VMT for rural and urban areas, respectively. NCDOT provides state and national averages by individual roadway classes. However, in cases where there is insufficient state safety data, NCDOT recommends use of national data. Consequently, the EIA applied national average

accident rates of 0.76 and 0.99 per 100 million VMT (for rural and urban areas, respectively) to estimate the future bypass-related safety benefits (NCDOT 2015b).

The future safety benefits for each alternative were determined by estimating the expected future accident rates based on their traffic volumes along controlled and uncontrolled access. The safety impact analysis also considered the differences between urban and rural highway areas. Each alternative's annual VMT projections were also used to estimate the average net change (i.e., compared to the No-Build) in the incidence and severity of expected future fatal and injury accidents.

The safety analysis also importantly differentiates between the future Base and Growth highway user populations. As discussed previously, both Alternative 51 and Alternative 1SB are slightly longer that the existing and Alternative 1UE routes, and so have more VMT for the same amount of traffic.

It is assumed the future accident rates on non-upgraded segments would remain unchanged at their higher than average rates. The bypasses in Alternatives 1SB and 51 as well as all of Alternative 1UE are expected to improve safety for future bypass users from the controlled access improvements. However, to be conservative, the EIA analysis did not attribute any safety benefits from reduced accident rates for roadway users from the reduced future traffic levels (as a result of vehicles redirected to the bypasses) and improved travel conditions on the existing US 70 route.

Table 3-8 includes the expected accident rates per 100 million VMT for both upgraded and non-upgraded segments. To be conservative, these values are used through the 2025 to 2044 study period and do not include any future safety improvements above current state average rates.

Table 3-8: Projected future accidents rates by alternative (per 100 million VMT)

Alternative	Roadway Segment	Condition	Type	Fatalities	Injuries	Non-Injury Accidents	Total Accidents
No Build	Existing US 70	No Change	Urban	0.99	90	215	306
			Rural	0.76	24	62	87
Alternative 1UE	Bypass	Access Controlled	Urban	0.52	21	62	83
			Rural	0.56	14	54	68
Alternative 1SB	Existing US 70	Bypassed Section Unchanged	Urban	0.99	90	215	306
			Rural	0.76	24	62	87
	Bypass	Access Controlled	Urban	0.52	21	62	83
			Rural	0.56	14	54	68
Alternative 51	Existing US 70	Bypassed Section Unchanged	Urban	0.99	90	215	306
			Rural	0.76	24	62	87
	Bypass	Access Controlled	Urban	0.52	21	62	83
			Rural	0.56	14	54	68

Source: NCDOT 2015b.

The projected annual reductions in future accidents by 2040 compared to the No-Build Alternative are shown in Table 3-9. These values are only for the Base traffic (i.e., traffic volumes that would otherwise be served under No-Build Alternative. The future accident projections for additional Growth traffic are estimated separately.

Table 3-9: Projected annual future accident reduction by alternative (2040)

Accident Type	Alternative 1UE	Alternative 1SB	Alternative 51
Fatalities	0.70	0.55	0.36
Injuries	76	55	45
Non-Injury	147	101	78
Total Accidents	224	157	123

Source: NCDOT 2015b; AECOM 2018.

The Table 3-9 projections in future accident reductions were used to estimate economic values of safety benefits for the Base user population. As discussed in Section 3.1, the Growth user population represents the additional highway users (compared to the No-Build Alternative) that would be accommodated by the project alternatives' increased service capacity. The future safety improvements for the Growth user populations were estimated per data from the Base population benefits under the assumption that the Growth users would otherwise face higher than average accident rates under the No-Build conditions. The future safety benefits for both the Base and Growth populations are shown individually in Table 3-10.

Table 3-10: Total economic value of safety benefits (2025–2044) (2016 $; $ millions)

Net Safety Benefits	Alternative 1UE	Alternative 1SB	Alternative 51
Safety Base (= No-Build Conditions)			
2040	$20.5	$15.2	$11.4
Total 2025-2044	$379.6	$279.1	$207.0
3% Discount Rate	$220.2	$161.7	$119.8
7% Discount Rate	$113.8	$83.4	$61.7
Safety Growth (> No-Build Conditions)			
2040	$0.2	$0.2	$0.5
Total 2025-2044	$4.6	$3.1	$7.5
3% Discount Rate	$2.7	$1.8	$4.2
7% Discount Rate	$1.4	$0.9	$2.0
Safety Total			
2040	$20.8	$15.4	$11.9
Total 2025-2044	$384.1	$282.2	$214.5
3% Discount Rate	$222.9	$163.5	$123.9
7% Discount Rate	$115.2	$84.4	$63.7

Source: NCDOT 2015b, AECOM 2018.

Note: Values may not sum as they are rounded

The benefit value of the accident reduction is based on standard USDOT values of $9.6 million per fatality, $174,000 per injury, and $3,200 for other non-injury accidents (2016 dollars) (USDOT 2017).

Alternative 1UE results in the largest safety improvement for the Base traffic population since it results in the highest controlled access highway use. As shown in Table 3-10, over the 2025 to 2044 study period Alternative 1UE would result in total safety benefits with an estimated economic value of $220 million (using a 3 percent discount rate).

Alternative 51 has the highest projected increase in new additional Growth vehicle trips and therefore would result in the greatest safety benefits. Over the 20-year study period, Alternative 51's future safety benefits are projected to total $4.2 million (using a 3 percent discount rate).

Overall, over the 20-year study period, Alternative 1UE is projected to result in the largest total travel safety benefit of $223 million (using a 3 percent discount rate).

3.4 OTHER HIGHWAY USER BENEFITS

Other potential highway user benefits from the proposed build alternatives future travel condition improvements are discussed below.

3.4.1 Fuel Savings

Vehicles traveling at a constant speed operate more efficiently than those that have to accelerate and decelerate. In addition to improved fuel efficiency (and therefore reduced fuel costs), vehicles traveling at a constant speed incur less brake and engine wear (and therefore reduced maintenance costs). Both of these factors result in net operating cost savings for the vehicle operators/owners.

Total fuel savings can be estimated by total VMT and the typical fuel consumption rate improvement for the roadway users. While the vehicle's average travel speed can be used as one measure of the vehicle's consumption rate, it does not fully represent the fuel cost for accelerating and stopping at stoplights nor does it account for the variable speeds created from increased roadway congestion.

The stoplights presently located along the US 70 corridor ensure that current US 70 users typically must stop multiple times during their trip. Under the No-Build Alternative, US 70 would continue to have non-controlled access and stoplight stoppages. Future traffic growth on US 70 would ensure even more frequent and longer stoplight delays for the 2040 No-Build Alternative. Although it cannot be readily quantified, the No-Build Alternative can nonetheless be expected to result in the highest average per vehicle fuel usage of all alternatives.

Alternative 1UE would be the most direct route through Kinston and consequently would result in the greatest total fuel saving as all vehicle traffic would instead travel on a controlled access freeway without any stoplights. Alternative 1SB would likely result in slightly higher total fuel savings compared to Alternative 51, as it is expected to divert more cars from US 70.

3.4.2 Improved Reliability

Increased travel reliability benefits highway users. Highway users are less accepting of and typically more inconvenienced by unexpected delays. Greater travel time predictability enables highway users to better plan their trips and reduce the amount of "buffer time" necessary to ensure they reach their destination at their planned arrival time. Greater travel reliability will thereby reduces variability in travel time either from late or early arrival at the planned destination.

The future reliability impacts of each alternative cannot be quantified due to the limited traffic modeling data. However, it is expected that all the build alternatives would improve US 70's reliability compared to the No-Build Alternative by greatly improving travel conditions for bypass users and to a lesser extent future use of existing US 70. Controlling future highway access on and off the highway and providing an upgrade through traffic route would increase average travel speeds and reduce accidents.

Both Alternative 1SB and Alternative 51 would be expected to result in slightly greater service reliability than Alternative 1UE. In addition, Alternative 1SB and Alternative 51 would provide future highway users alternate route options in the event of a major accident or other delays occurring along either roadway.

3.5 BUSINESS PROFITABILITY

The project's potential impacts on Lenoir County's businesses' productivity were assessed by separately evaluating the likely impacts on revenue/sales performance and operating costs. These impacts were qualitatively analyzed in the 2016 EIA. As discussed in Chapter 1, no significant changes in the existing conditions or the project alternatives has occurred since the 2016 EIA, and therefore, the nature of the business profitability impacts are also expected to be similarly unchanged. However, as a result of the change in the traffic projections, the magnitude of the 2018 EIA's business profitability impacts might be expected to differ from those expected under the 2016 EIA.

Consequently, the business profitability impacts for the 2018 EIA are briefly discussed below.

3.5.1 General

Revenue impacts typically depend on changes to the businesses' sales quantities as product sale prices are generally related to their production costs.

The extent of the potential direct revenue effects varies among businesses and is most applicable to retail or service businesses. Highway market dependent businesses (such as gas stations or fast food restaurants) that cater mostly to pass-through traffic customers are most likely to be negatively affected by a new bypass development. Routing pass-through traffic away from current business locations may reduce their ability to directly capture sales from these highway users. Instead these vehicles will travel faster on the controlled-access roadway and likely be less inclined to opportunistically divert from their trip. Faced with a smaller market, sales for these businesses would be expected to decrease. The extent of their sales decrease could be directly related to the proportional decrease in traffic volumes, unless they can either attract a greater proportion of highway users to divert to their businesses (e.g., promotion) and/or encourage their remaining customers to spend more (e.g., improved selection of goods).

Nevertheless, there are numerous reasons to suggest that the majority of non-local travelers that are interested in stopping in Kinston for goods and services are expected to continue to stop in Kinston. First, Kinston's location along US 70 will remain a natural break point for many non-local users as it is at the approximate mid-point between Raleigh and the coast and it is a considerable distance to the other primary alternative stopping points of Goldsboro (28 miles west) and New Bern (35 miles). The recently completed US 70 Goldsboro bypass is also routed more than 5 miles from Goldsboro's main business district, which may be expected to discourage some travelers from stopping.

Secondly, unlike Goldsboro there will be only a minor time differential for non-local travelers between Alternatives 1SB and 51 and the US 70 route. Particularly under Alternative 1SB and Alternative 51, vehicles selecting to remain on the existing US 70 roadway would experience improved travel conditions as non-local pass-through travelers would instead use the bypass. Alternative 1UE's interchanges would also be located only 1 to 1.5 miles from Kinston's existing main business clusters. The short diversion time to reach the existing business clusters and an easy ability to "drive through" to reconnect with the highway (i.e., without doubling back) would allow and encourage the more spontaneous stopping decisions. Although Alternative 1UE would route highway users in close proximity to the existing business clusters,

some travelers' unplanned stops may be discouraged if they perceive that they will have to double-back to reach businesses.

Thirdly, a large portion of US 70 non-local users likely travel the roadway repeatedly and therefore are very familiar with their route and businesses options. This suggests that many non-local travelers are well informed of the business locations and route options to minimize the time cost for stopping en route in Kinston.

Finally, Kinston is also fortunate to have several very well-established business destinations (e.g., Neuse Sport Shop, King's BBQ, and Walmart) that will continue to draw many non-local travelers to stop en route in Kinston.

Improved highway access and reduced travel times can benefit businesses in several ways. Better access can expand retail businesses' market areas as they can serve a larger population. Businesses that primarily serve local residents (e.g., dry cleaners or clothing stores) would likely incur limited or no significant adverse impact on sales from the build alternatives diverting pass-through traffic. Moreover, reduced congestion may encourage local consumers to frequent some businesses more often. Local serving businesses may find that some customers living farther away may find it more convenient to shop at their stores after the project has been built (i.e., increasing their market area).

Regionally-serving businesses (e.g., Walmart) may also benefit from improved access that increases their market reach and/or results in less local congestion. Similarly, destination businesses (i.e., businesses that attract tourists or visitors from other regions) may also benefit from the build alternatives. Improved access should increase traffic for these businesses. For instance, the water park in Kinston could expect to see a slight increase in its attendance in the coming years as congestion declines and regional accessibility improves.

In general, the highway improvements could potentially have significant future revenue benefits only for those manufacturing (or other non-retail businesses) that directly serve large customer bases. Although most businesses may have operating cost benefits from the highway improvements, businesses where travel is required by an employee (e.g., a local delivery service or an appliance repair business) should realize efficiency improvements for their operations.

Logistics is typically a major operational requirement and cost component for most businesses. Transportation costs are particularly important for businesses that either import large quantities of raw materials or other important inputs, and/or transport their finished products out to other markets.

Currently, several of Kinston's manufacturers are major truck freight users. It is estimated that 500 trucks travel in and out of the GTP daily. In addition, an average of 70 trucks per day make customer deliveries from the DuPont Plant located north of Kinston on NC 11 (Cambridge Systematics 2014).

Improved logistical efficiency would decrease transportation costs in labor costs for drivers, fuel savings, and other vehicle operating costs. For businesses that make numerous daily trips, shorter trip times would enable them to make additional deliveries in the same amount of time, thereby improving productivity.

Better transportation access would also increase the potential labor pool available to Lenoir County businesses as workers would be willing to commute daily from a wider geographic radius. This would increase the number of potential employees and the availability of skilled workers. Access to a larger labor force can help reduce employers' labor costs as there would be more candidates for jobs (possibly resulting in lower wage costs) and/or employers could locate employees with better skills and experience at the prevailing wage rate. Either (or both) of these factors should result in greater productivity for employers from their labor force.

3.5.2 Retail Sales Shift Impacts

Sales shift analysis is limited to the retail sales by highway dependent businesses estimated under the No-Build Alternative at $277 million per year in 2040. All future retail sales projections are expressed in terms of 2016 dollars. The sales shift analysis also assumes that there are no changes in customer spending profiles or demand. As a result, future average per vehicle spending is assumed to remain unchanged at $40 to $60 per car stop. Trucks are assumed to have a higher average spending per vehicle stop ($135 per truck stop) due to their larger fuel tanks. This value includes not only fuel and fast food, but incorporates other retail and services purchases.

For the purposes of the EIA analysis, the baseline assumes that no new major construction would occur. Due to the lack of population growth projected by the state, the local growth is assumed to remain constant between 2015 and 2044. As a result, the projected future traffic growth is expected to predominantly result from increased pass-through trips by non-local highway users.

The sales activity generated under the three build alternatives is compared to the baseline (No-Build) alternative. It is assumed that all build alternatives would be operational by 2025. No disruption to existing business operations and revenue losses during the project's construction phase between 2020 and 2024 are estimated for several reasons. A primary reason is due to the difficulty and lack of information for (1) identifying the extent and duration of the future construction activity by location to determine the changes in access and travel conditions and (2) projecting the customer and businesses response to those conditions. At this stage of analysis, any quantification of these factors and their combined economic outcomes would be overly speculative given the existing uncertainty and major effort that would be required to develop adequate information for each of the build alternatives. Consequently, the construction-related impacts of the build alternatives were not quantified but are instead evaluated qualitatively.

Generally, the negative impact would be temporary (2 to 3 years overall and less for individual roadway segments). In addition, there would be positive economic effects for Lenoir County from construction-related employment and spending. Nonetheless, the future construction activities may result in short-term disruptions to existing businesses in the construction corridor as local roadway access and travel conditions may be adversely affected. The potential for construction-related adverse impacts to existing businesses can be expected to be greatest under Alternative 1UE as existing US 70 businesses would be directly affected by the construction work. In addition to impacting the largest number of businesses, the average sales of the individual US 70 businesses are typically higher than those for most of the businesses located along Alternative 1SB and Alternative 51. Conversely, due to its more rural route, Alternative 51's construction would be expected to result in the least and only limited business disruption impacts.

Although it cannot be projected at this stage of analysis, it is possible that in some cases severe and/or prolonged disruptions to individual businesses could result in their permanent relocation and/or closure. The occurrence and extent of more severe and permanent construction related impacts would depend on the specific circumstances (both of the affected businesses and construction activity). Any such construction activity-related displacement (i.e., specifically distinct from displacements due to the bypass development footprint) would likely only occur under Alternative 1UE where there is a large number of affected businesses and a constrained construction corridor. However, many bypass development-related business relocations would occur and be publically known, which would be expected to improve future market opportunities for the other remaining businesses. As a result, few if any additional construction-activity displacements may be expected to occur as subsequent market changes may encourage those non-displaced businesses to instead remain.

Each alternative's traffic volumes are assumed to begin in 2025 and subsequently grow steadily up to their projected 2040 levels. Table 3-11 depicts the vehicle type composite for US 70 in 2040 as well as the total ADT. The increase in ADT compared to the 2015 No-Build Alternative (44,200 ADT) is projected to result primarily from additional non-local through traffic. This would result in changes in the vehicle trip type composition with a decrease in non-work local trips and increase in non-work trips by non-locals.

Table 3-11: Vehicle trip type by alternative (2040)

Trip Type	No Build (2015)	No Build	Alternative 1UE	Alternative 1SB	Alternative 51
Truck	15%	15%	15%	15%	15%
Commuter	42.5%	42.5%	42.5%	42.5%	42.5%
Non-Work (Local)	30%	17.6%	17.2%	17.2%	16.2%
Non-Work (Non-Local)	12.5%	24.9%	25.3%	25.3%	26.3%
Total ADT		57,900	58,700	58,600	58,600[1]

Sources: AECOM 2017; USDOT 2015 auto (small and medium)

Note: Values rounded and may not sum exactly.

[1] Alternative 51 includes out of region trips by south county residents who would not make any significant local retail sales. Consequently, the total ADT was reduced to Alternative 1SB levels to avoid overestimating Alternative 51's future retail sales growth in the sales shift analysis.

The future traffic volumes would result in changes in trip type proportions and the weighted average projected capture rates (Table 3-12). Vehicles using the build alternatives are assumed to have a 0 to 10 percent reduction in the percentage of vehicle stops compared to the No-Build Alternative.

Table 3-12: Projected capture rates (2040)

Trip Type	No Build	Alternative 1UE	Alternative 1SB	Alternative 51	Capture Rate Change
Truck	5%	5%	5%	5%	0%
Commuter	30%	27%	28.5%	28.5%	5 to 10%
Non-Work (Local)	50%	47.5%	50%	50%	0 to 5%
Non-Work (Non-Local)	20%	18%	19%	18%	5 to 10%
Average	28.6%	26.1%	27.5%	26.9%	4 to 9%

Source: AECOM 2017

Future highway dependent retail sales are projected based on projected trip type traffic volumes (shown in Table 3-11), adjusted to current highway user trip and retail assumptions (Section 2.3.2). Adjustments in future captures rate for the alternatives were determined based on overall assessment of each route's travel conditions, route and vehicle trip type. As discussed in Section 3.5.1, few users planning to stop in Kinston en route would be expected to be discouraged from doing so based on Kinston's location, user familiarity, the proposed routes, and comparative travel times.[4] The other major effect on highway user spending would be on potential "last minute" or impulse stops that users would otherwise make under the No-Build Alternative.

Under the build alternatives, impulse decisions and stops would continue to be possible along most of US 70 and as such the sales conditions determine the base case for the sales shift analysis. These are more opportunistic purchase decisions and are distinct from intention and planned decisions to stop for goods or services in that the user selection of the retailer and/or merchandise would be more guided by circumstances and convenience rather other factors (e.g., brand, prices, service, and goods selection).

Under the No-Build Alternative, it is expected that most highway users would travel this route regularly and as a result impulse or unplanned purchases likely account for a minor portion of their stops and purchase. For the purpose of the analysis (and ease of calculation) it was assumed that impulse purchases account for an equivalent to 5 percent capture rate based on the combined frequency and type value of the merchandise purchased during impulse stops. For example, while 10 percent of stopping vehicles may have an impulse purchasing decision, if their subsequent total expenditures are half of the typical average spent by other users then the effective capture rate (based on average user spending amounts) would be equivalent to 5 percent of the planned stops. Impulse purchases are conservatively assumed to account for 5 percent of total sales by both commuter and non-work trips (either local or non-local users).

[4] In fact, it is possible that under Alternative 51, improved US 70 travel conditions might make future users more inclined to stop and/or increase their local purchases, which would result in sales shift growth.

Truck drivers would plan their routes and given the minor differences between the current US 70 and bypass routes' travel distances and travel times, the truck user capture rates are expected to remain unchanged under all alternatives.

However, under all build alternatives it was conservatively assumed that users on the controlled access bypass would be unlikely to make the impulse purchases that otherwise would occur under the No-Build Alternative. Consequently, the capture rates for both commuter and non-work non-local trips under the build alternatives were reduced by 5 percent.

In addition, reduced accessibility to businesses under both Alternative 1UE (controlled access) and Alternative 1SB (longer distance) was assumed to further reduce their future capture rate by an additional 5 percent.

Finally, under Alternatives 1SB and 51, the capture rates for non-work trips by locals were assumed to be unchanged from the No-Build Alternative since local users' routes and access to US 70 businesses would remain unchanged (with uncontrolled access). However, due to Alternative 1UE's reduced accessibility to the existing US 70 businesses, the sales capture rate for its non-work trips by local users was reduced by 5 percent.

Table 3-13 summarizes the retail sales projections for the project alternatives. In line with the annual stops, each build alternative is projected to result in lower total sales. The sales shift is determined by comparing each build alternative to the No-Build Alternative.

Table 3-13: Projected retail sales shift by alternative (2040) (2016 $; $ millions)

Sales Shift Analysis	No-Build Alternative	Alternative 1UE	Alternative 1SB	Alternative 51
Stops (1,000/year)	5,764	5,344	5,613	5,491
Sales				
2040 ($M)	$277.4	$258.4	$270.7	$265.5
Total (2025-2044)	$5,309	$4,956	$5,192	$5,098
3% Discount rate	$3,098	$2,892	$3,030	$2,976
7% Discount rate	$1,613	$1,507	$1,578	$1,550
Sales Shift				
2040 ($M)	-	($19.1)	($6.7)	($11.9)
Total (2025-2044)	-	($353.4)	($117.6)	($211.6)
3% Discount rate	-	($205.2)	($67.7)	($122.0)
7% Discount rate	-	($106.2)	($34.6)	($62.6)
Sales shift (%)	-	-6.6%	-2.2%	-3.9%

Source: AECOM 2017

The EIA conservatively projects that the future No-Build Alternative would result in the greatest retail growth, with an estimated future sales growth for US 70 highway market dependent retail businesses of $277 million (in 2016 dollars) in 2040.

Of the bypass alternatives, Alternative 1SB is expected to have the highest capture rate since highway users would have relatively unchanged access to the businesses located along US 70's central segment. In addition, Alternative 1SB users can easily divert to US 70 primary commercial areas due to their relative proximity (less than 1.25 miles) from the expected future bypass interchange locations. Given the similarity in the future traffic volumes for the bypass alternatives, Alternative 1SB has the highest projected sales in 2040 and consequently would result in the lowest annual sales shift impact ($6.7 million and 2.2 percent, respectively, in 2040). Over the 20-year study period, Alternative 1SB sales shift impact is estimated to total up to $68 million (at a 3 percent discount). This may be considered a conservative high estimate of the sales shift impacts since no future sales changes have been attributed for either (1) the No-Build worsening travel conditions or (2) the improved future travel conditions along the existing US 70 roadway under Alternatives 1SB and 51.

3.6 IMPACTS TO EXISTING BUSINESSES

The impacted businesses are identified by the R-2553 Relocation Report (NCDOT 2017).

Numerous factors can contribute to determining each build alternative's expected future economic impacts. While some factors may be externally defined (e.g., the project's geographical/spatial context and constraints), the local community may be able to manage other factors to reduce adverse impacts and/or encourage future economic development.

Project-related highway accessibility and/or land use changes would most directly impact Kinston's existing businesses and economy. Highway accessibility impacts may result in travel distance, travel time, and/or visibility changes, which may adversely or positively affect Lenoir County's existing and future businesses. The nature and extent of the accessibility impacts will depend on not only their magnitude but also the specific location and type of businesses. Similarly land use changes and encroachment impacts may preclude use of some land areas located with the future bypass right-of-way.

The impacts to any displaced businesses (which may be distinct from the land owners who will be financially compensated) would consist of their lost future net earnings potential (i.e., revenues minus business costs). However, except for the one-time relocation cost, the displaced businesses would probably not incur any long-term net earnings losses if other comparable relocation sites were available nearby. Given the availability of underused and developable land sites in Lenoir County (as defined by the LUSA), it would be reasonable to expect that future business relocations should be possible to reduce the future displacement impacts.

The net sales shift impacts to highway market-dependent retail businesses are discussed in Section 3.5. This section focuses on the impact to all businesses (i.e., including agricultural, manufacturing, and local-serving retail businesses) located in the future bypass right-of-way. The impacts to these existing businesses were analyzed by first identifying the existing land uses in each alternative's right-of-way. Generally, a 1,000-foot buffer zone was used to determine the land parcels and structures that would potentially be physically impacted. For each alternative,

the encroachment and access impacts to the parcels in its right-of-way buffer zone were evaluated to determine the expected property acquisition and relocation requirements.

The type and number of impacted businesses was determined for Alternative 1SB and Alternative 51. In addition, the right-of-way acquisitions and relocation costs for Alternatives 1SB and 51 were estimated. The analysis also considered the availability of alternate sites and estimated the economic impact from project-related lost farmland.

3.6.1 No-Build Alternative

No displacement or access impacts to the existing businesses would occur since there would be no change to US 70 under the No-Build Alternative.

The 2018 EIA conservatively assumes that future retail sales growth for highway market-dependent businesses would not be impacted by future increased congestion on US 70. Similarly, the 2018 EIA also assumes no major adverse impacts on Kinston's highway-reliant (e.g., major manufacturers) or local-serving businesses would occur.

Nonetheless, it might be reasonably asserted that future degraded traffic conditions on US 70 may discourage its future use (and thereby US 70 businesses sales) by locals or commuters with other destination and/or route options. In which case, any resulting sales leakage and/or reduced local employment would result in adverse impacts on the regional economy.

3.6.2 Land Use for Build Alternatives

The build alternatives would impact land use in the direct community impact area (DCIA) as shown in Table 3-14. Alternative 51 would impact the largest land area (2,850 acres) as it is the longest alternative. Alternative 1UE would require the smallest land area (2,153 acres), while Alternative 1SB's DCIA would be slightly larger (2,276 acres).

Table 3-14: Land use in the DCIA (acres)

Alternative	Total[a]	Agriculture	Commercial	Industrial	Residential	Other[b]
Alternative 1UE	2,153	1,009	309	104	103	628
Alternative 1SB	2,276	1,273	135	86	112	670
Alternative 51	2,850	2,080	38	13	100	620

Source: AECOM 2017.

[a] Total acreage in the 1,000-foot buffer zone.

[b] Includes vacant or forested properties, utilities, community facilities, and right-of-way.

For all alternatives, the largest share of impacted land consists of farmland. While farmland accounts for roughly 50 percent of impacted land for both Alternative 1UE and 1SB, Alternative 51 has a significantly higher share (73 percent). Alternative 1UE would impact the largest commercial and industrial areas since its future right-of-way would be located in the current US

70 corridor where many of Kinston's businesses are currently located. The acreages of residential and other land uses in Alternative 1SB and Alternative 51's DCIA are fairly similar.

3.6.3 Property Relocations

The R-2553 Relocation Report (NCDOT 2017) identified the property acquisitions and relocations required by each build alternative (shown in Table 3-15). The majority of the impacted properties would occur at the future interchange locations.

Table 3-15: Property relocations

Alternative	Properties for Relocation				Acreage	
	Total	Residential	Business	Other	Total	Farmland
Alternative 1UE	569	128	188	253	1,220	270
Alternative 1SB	467	165	115	187	1,309	464
Alternative 51	310	108	24	178	1,273	743

Source: NCDOT 2017.

The total land acquisition acreages required by the build alternatives are comparable and range between 1,220 acres (Alternative 1UE) and 1,309 acres (Alternative 1SB). However, while approximately 58 percent of Alternative 51's impacted land area is farmland, farmland represents a much smaller proportion of the acquisition land for both Alternative 1SB (35.4 percent) and Alternative 1UE (22.1 percent). Alternative 1SB would require the highest number of residential relocations (165 parcels) followed by Alternative 1UE (128 parcels). According to the R-2553 Relocation Report (NCDOT 2017), approximately 50 percent of the residential displacements would be single family residences and the remaining 50 percent would consist of mobile homes.

According to the R-2553 Relocation Report, most relocations would occur at the future interchange locations. Alternative 1UE would require relocation of 569 properties, which is most of the build alternatives. Of these an estimated 188 have been identified as existing businesses and 128 residential properties. Alternative 51 would require the fewest property acquisitions and relocations with an estimated 310 relocations of which only 24 would be businesses. Furthermore, only four businesses for relocation where identified in Alternative 51's bypass right of way. The other 24 property relocations are common to all the build alternatives as they are located on non-bypass sections of US 70 (e.g., in La Grange).

3.6.4 Relocation Impacts

The businesses expected to require relocation were identified for each build alternative based on the relocation analysis findings (NCDOT 2017). Economic data from InfoUSA were used to classify each business by their business sector and to estimate their annual sales and employment. Additional research and analysis was performed to revise incomplete or inaccurate data identified in the economic dataset.

Table 3-16 shows the estimated average annual sales and employment associated with the businesses that would be relocated under each alternative. The impacted businesses were also separated into two groups – highway market dependent and other businesses. The highway market dependent group consisted of lodging, food and beverage, entertainment, and retail businesses. This includes businesses such as lodging, fuel stations, fast food restaurants, and convenience stores that obtain a major proportion of their sales from non-local highway users, and therefore proximity and easy access from the highway are important for their success.

Table 3-16: Business relocation impacts by alternative (2016 $; $ millions)

	Alternative 1UE	Alternative 1SB	Alternative 51
Total Business Relocations	**137**	**66**	**26**
Highway Market Dependent	69	31	12
Other Businesses	68	35	14
Total Sales ($ Millions/year)	**$150**	**$49**	**$16**
Highway Market Dependent	$82	$25	$11
Other Businesses	$68	$24	$5
Total Jobs	**1,158**	**349**	**178**
Highway Market Dependent	652	188	127
Other Businesses	506	161	51

Source: NCDOT 2017; AECOM 2018.

Note: Business relocations listed in Table 3-16 differ from those shown in Table 3-15 and in the relocation report, as the EIA only considered operational businesses, whereas the relocation report considered commercial or business properties, regardless of whether there was an operational business.

However, this classification is very conservative as it also includes many retail and food businesses primarily serving local customers that will not be highway market dependent if they are largely destinational and/or provide non-impulse goods and services (e.g., groceries, appliance sales, etc.).

The remaining businesses were aggregated as other businesses. While these other businesses may rely on the highway for their customers, employees, and suppliers to access their facility, their sales are not predominantly obtained from in-transit highway users making unplanned stops and/or purchase decisions.

As a result, the values shown in Table 3-16 provide a highly conservative estimate of the businesses that would require relocation to alternate sites with highway access since it does not differentiate those businesses that provide goods and service for non-local customers travelling through Kinston. If there is an insufficient supply of suitable highway-accessible sites then some displaced highway market dependent businesses may leave the area, which can increase the future “sales leakage” out of the local economy. This would represent a negative economic impact for both the permanently displaced businesses and also potentially for the local economy (if the sales leakage cannot be served and captured by other local businesses). The economic impact could also be more long-term if the site availability constraints persist and are not corrected through planning, rezoning, or other means.

Non-highway market dependent businesses will have a greater selection of alternative relocation sites and generally will be far less liable to long-term adverse sales or business impacts from the relocation. The economic impacts for specific business from relocation may also differ depending on the condition of their current property. Businesses and/or land owners of outmoded buildings may benefit from an opportunity to revitalize their businesses.

The relocation decisions by project displaced businesses would depend on numerous factors and circumstances specific to each business). All else being equal, given adequate compensation and availability/affordability of comparable business sites, displaced businesses would be expected to remain locally to take advantage of their existing customer base and market knowledge. Common relocation considerations include internal (e.g., owner's access to capital, interest in growth, and alternate business opportunities) and external factors (i.e., market conditions, alternate site suitability).

As a result, while it is difficult to project individual business decisions, it is the overall net economic outcomes that are most relevant to the EIA. No net loss to the local economy would occur if an existing business's lost sales and jobs are subsequently recaptured by other existing businesses or new ventures. The sales shift analysis in Section 3.5.2 provides an evaluation the potential net economic effect to Lenoir County's future retail and hospitality sector growth on Lenoir County.

Sales shift analysis was not performed for the non-highway market businesses since future changes in US 70 traffic volumes and travel conditions would not be expected to result in direct changes in their business sales. As previously discussed, the project would have more indirect and lesser effects on their business performance or relocation decisions to remain or exit the US 70 corridor or the county. However, it may be expected that more highway reliant businesses either for their customers (e.g., destinational and/or local market serving retail or services businesses) or operations (e.g., involving frequent deliveries of supplies or products) would be more inclined to seek sites that provide better future US 70 access.

3.6.4.1 Alternative 1UE

Table 3-17 shows the total projected business relocations that would be necessary under Alternative 1UE. The table also shows the business relocations that would only occur under Alternative 1UE and those that would also occur under other build alternatives. Overall, 137 businesses would be relocated under Alternative 1UE. Retail and lodging/food businesses account for 42 and 27 of the impacted businesses, respectively. Other non-highway market dependent businesses would account for the other half of the business relocations. The retail and lodging/food businesses that would have to be relocated would include numerous major and well-established local businesses. These would include Neuse Sports Shop, Galaxy of Sports, Kings Restaurant, and the Hampton Inn. Major non-visitor serving businesses that would need to be relocated would include Vision Painting, Wall Lenk, and Hobart Sales.

Table 3-17: Business relocation impacts - Alternative 1UE (2016 $; $ millions)

	Alternative 1UE Only	Common to Alternatives 1UE and 1SB	Common to all Alternatives	Total
Business Relocations	**88**	**25**	**24**	**137**
Highway Market Dependent	47	10	12	69
Other Businesses	41	15	12	68
Annual Sales ($ millions/year)	**$120**	**$16**	**$14**	**$150**
Highway Market Dependent	$61	$10	$11	$82
Other Businesses	$59	$6	$3	$68
Employment	**923**	**67**	**168**	**1,158**
Highway Market Dependent	497	28	127	652
Other Businesses	426	39	41	506

A majority of the relocated businesses (88) are located in the segment that would not be upgraded on either one of the other build alternatives and as a result would only be relocated if Alternative 1UE is built. Approximately half (25) of the other 49 impacted businesses are located along roadway sections that would be upgraded under both Alternative 1UE and Alternative 1SB and would be relocated under both alternatives. The other 24 impacted businesses are located in the eastern and western sections of US 70 (i.e., in La Grange or Dover) and would be relocated under all build alternatives.

As shown in Table 3-17, the annual sales and employment of the total relocated businesses are estimated to be $150 million per year and 1,158 jobs. It was conservatively estimated that up to 69 highway market dependent businesses would be relocated under Alternative 1UE. The highway market dependent businesses account for $82 million (55 percent) of the sales and 652 (56 percent) of the jobs that would be relocated under this alternative.

However, as previously discussed, only a portion of these sales and jobs would actually be from non-local highway users and therefore would be liable to sales leakage losses from changes in highway user routing and site accessibility. Furthermore, only the highway market dependent businesses would require alternative sites with comparable (or better) access to highway customers for their future business success to avoid any long-term adverse economic impacts from their relocation.

The other 68 businesses that would be relocated under Alternative 1UE are estimated to have annual sales of $68 million and provide 506 jobs for the local economy. As previously discussed, both of the other businesses and the non-highway market dependent retail and food businesses can select from a wider selection of alternate sites and consider other factors in their relocation

decisions. It is also expected that there would be less potential and likelihood for any long-term economic impacts from their displacement and relocation.

Land use analysis for the project has identified 58 existing business sites (with 85.5 acres) located in the US 70 corridor. These sites are currently vacant or underutilized and would be suitable for the displaced highway market dependent businesses. In addition, there are more than 7,000 acres of vacant or underutilized land in the 1,000-foot corridor for the Alternative 1UE bypass route. More than half of that land is currently zoned for commercial (1,800 acres) or industrial use (1,600 acres). This indicates that there will be more than adequate land availability for all the businesses that would have to relocate under this alternative.

Alternative 1UE would result in far more business relocations than Alternatives 1SB and 51. As shown in Table 3-17, 88 businesses are located in the alternative's bypass segment and therefore would be relocated only under Alternative 1UE. These businesses have an estimated 923 employees and approximately $120 million in annual total sales. The other 49 impacted businesses would also be relocated under the other build alternatives. In contrast, there would be 17 businesses that would require relocation solely under Alternative 1SB (Table 3-18). These businesses are estimated have annual total sales of less than $19 million and employ 114 workers.

Table 3-18: Business relocation impacts - Alternative 1SB (2016 $; $ millions)

	Alternative 1SB Only	Common To Alternatives I UE and 1SB	Common to all Alternatives	Total
Business Relocations	**17**	**25**	**24**	**66**
Highway Market Dependent	9	10	12	31
Other Businesses	8	15	12	35
Annual Sales ($ millions/year)	**$19**	**$16**	**$14**	**$49**
Highway Market Dependent	$4	$10	$11	$25
Other Businesses	$15	$6	$3	$24
Employment	**114**	**67**	**168**	**349**
Highway Market Dependent	33	28	127	188
Other Businesses	81	39	41	161

Consequently, Alternative 1UE would result in a considerably greater shift in Kinston's economy in terms of the number of impacted businesses, the magnitude of the relocated economic activity, and the types business types affected. In addition, the larger size of its highway market dependent business relocations would have a greater risk and potential for

incurring future sales leakages and long-term adverse economic impacts if those businesses are subsequently unable to relocate and operate profitably at other suitable sites in the local area.

3.6.4.2 Alternative 1SB

Overall, 66 businesses would be relocated under Alternative 1SB. Retail and lodging/food businesses account for 20 and 11, respectively, of the impacted businesses. Other non-highway market dependent businesses would account for the other 35 business relocations. The major local businesses that would be relocated under Alternative 1SB include MMM Inc. (manufacturing) and H&H Farm Supply.

There are 17 businesses located in the bypass segment of the alternative and therefore would only have to be relocated if Alternative 1SB is built. Another 25 businesses are located along roadway sections that would be upgraded under both this alternative and Alternative 1UE and would be relocated under both alternatives. The remaining 24 impacted businesses are located in the eastern and western sections of US 70 (i.e., in La Grange or Dover) and would be relocated under all build alternatives. Table 3-18 includes this breakdown.

As shown in Table 3-18, the annual sales and employment of the total relocated businesses are estimated to be $49 million per year and 349 jobs. It was conservatively estimated that up to 31 highway market dependent businesses would be relocated under Alternative 1SB. The annual sales and employment by these businesses are estimated to be $25 million per year and have 188 employees. The “other” businesses that would be relocated under Alternative 1SB are estimated to have annual sales of $24 million and provide 161 jobs for the local economy.

Land use analysis for the project identified 14 existing business relocation sites (with 16.4 acres) located in the Alternative 1SB corridor that are currently vacant or underutilized that would be suitable for displaced highway market dependent businesses. In addition, there is nearly 6,000 acres of vacant or underutilized land in the 1,000-foot corridor for Alternative 1SB. More than half of that land is currently zoned for commercial (1,600 acres) or industrial use (1,580 acres). This indicates that there will be more than adequate land availability for all the businesses that would have to relocate under this alternative.

Alternative 1SB would result in fewer business relocations than Alternative 1UE. As shown in Table 3-18, 17 businesses would solely be relocated under Alternative 1SB. These affected businesses currently have estimated annual sales of approximately $19 million and 114 employees.

The other 49 impacted businesses that would be relocated under Alternative 1SB would also be relocated under Alternative 1UE. However, only 24 of these businesses would need to be relocated if Alternative 51 was implemented.

Consequently, Alternative 1SB would result in a far lesser shift in Kinston’s economy in terms of the number of impacted businesses, the magnitude of the relocated economic activity, and the types business types affected. In addition, the smaller size of its highway market dependent business relocations would result in a lesser risk and potential for incurring future sales leakages and long-term adverse economic impacts than Alternative 1UE.

3.6.4.3 Alternative 51

Overall, 26 businesses would be relocated under Alternative 51. However, in its bypass segment only two businesses would have to be relocated if Alternative 51 is built. Neither of the businesses are highway market dependent businesses. The other 24 impacted businesses are located in the eastern and western sections of US 70 (i.e., in La Grange or Dover). Under both of the other build alternatives all of these 24 businesses would also have to be relocated. Table 3-19 includes this breakdown. The Sandpiper Seafood House, Bojangles, and Monks Furniture warehouse are the most prominent of the six retail and six food businesses that would be displaced.

Table 3-19: Business relocation impacts - Alternative 51 (2016 $; $ millions)

	Alternative 51 Only	Common to all Alternatives	Total
Business Relocations	**2**	**24**	**26**
Highway Market Dependent	0	12	12
Other Businesses	2	12	14
Annual Sales ($ millions/year)	**$2**	**$14**	**$16**
Highway Market Dependent	$0	$11	$11
Other Businesses	$2	$3	$5
Employment	**10**	**168**	**178**
Highway Market Dependent	0	127	127
Other Businesses	10	41	51

As shown in Table 3-19, the annual sales and employment of the total relocated businesses are estimated to be $16 million per year and 178 jobs. It was conservatively estimated that 12 highway market dependent businesses would be relocated under Alternative 51. The annual sales and employment by these businesses are estimated to be $11 million per year and 127 jobs, respectively.

Land use analysis for the project identified 7 existing business relocation sites (with 9.4 acres) located in the Alternative 51 corridor that are currently vacant or underutilized that would be suitable for displaced highway market dependent businesses or future new highway serving businesses. In addition, there is over 5,300 acres of vacant or underutilized land within the 1,000-foot corridor for Alternative 51. Although much of the corridor is undeveloped, a majority is currently zoned for commercial use (1,630 acres). This indicates that there would be more than adequate land availability for all the businesses that would have to relocate under this alternative.

Alternative 51 would result in the fewest business relocations. As shown in Table 3-19, only two businesses with annual sales of less than $1.6 million and 10 employees would solely be relocated under Alternative 51. The other 24 businesses would also be relocated under both of the other build alternatives. In contrast 88 businesses would be relocated under Alternative 1UE with total annual sales of $120 million and that employ 976 workers (Table 3-17).

Consequently, Alternative 51 would result in the least and relatively minor shift in Kinston's economy in terms of the number of impacted businesses, the magnitude of the relocated economic activity, and the types business types affected. The comparatively small number of highway market dependent business relocations would result in the least risk and potential for incurring future sales leakages and long-term adverse economic impacts.

3.6.5 Impacts to Agricultural Production

Farmland accounts for the largest share of the impacted land area under all the build alternatives. Table 3-17 shows the annual revenue impact to local farmers based on the lost farmland acreage and average crop revenues. All the impacted farmlands would be purchased from land owners to compensate for their property losses.

However, in addition to this financial reimbursement, taking this agricultural land out of production could also result in lost economic activity for the local economy. Strictly speaking there would only be a net loss to the local economy if the displaced farming could not be relocated elsewhere in the county. Given the availability of other comparable farmland in the area, impacted farming businesses should be able to relocate and thereby avoid any future decrease in Lenoir County's farming activity and net earnings.

The EIA nonetheless estimated the annual revenue losses under each alternative as a conservative estimate of the potential economic impact of the lost productivity associated with the displaced farmland. Wheat, corn, soybean, and tobacco are the most commonly grown crops in Lenoir County. Annual revenues for Lenoir County croplands average approximately $1,300 per acre based on a typical local crop mix, yields, and crop values (NASS 2017). The estimated annual total and net revenue impacts for each build alternative are shown in Table 3-20.

Table 3-20: Total and net revenue impacts to agriculture (2016 $)

	Average revenue per acre [a] ($/acre)	Lost Farmland (acres)	Total annual revenues ($/year)	Annual net revenues ($/year)
Alternative 1UE	$1,300	270	$351,000	$88,000
Alternative 1SB	$1,300	464	$603,000	$150,000
Alternative 51	$1,300	743	$966,000	$242,000

Source: NASS 2017.

[a] Estimated weighted average of the four most common crops (wheat, corn, soybeans, and tobacco). Values are rounded.

3.6.5.1 Alternative 1UE

Under this alternative, 270 acres of farmland would be taken out of production and result in lost total revenues of $351,000 per year for the local economy. Conservatively assuming that the net revenues from farming could be up to 25 percent of sales, the net revenue impact to local farmers would total $88,000 per year.

3.6.5.2 Alternative 1SB

Under this alternative, 464 acres of farmland would be taken out of production and result in lost total revenues of $603,000 per year for the local economy. Conservatively assuming that the net revenues from farming could be up to 25 percent of sales, the net revenue impact to local farmers would total $150,000 per year.

3.6.5.3 Alternative 51

Under this alternative, 743 acres of farmland would be taken out of production and result in lost total revenues of $966,000 per year for the local economy. Conservatively assuming that the net revenues from farming could be up to 25 percent of sales, the net revenue impact to local farmers would total $242,000 per year.

Since Alternative 51 has the greatest loss in farmland, it results in the highest annual revenue losses to the local economy and farmers. Nonetheless, the magnitudes of these revenue impacts are near negligible compared to those for other affected land uses.

3.7 NET BUSINESS DEVELOPMENT IMPACTS

The impact analysis considers the impact of the projected traffic volume and highway accessibility changes on the project study area's current and future land use patterns. The purpose of the net business development impact analysis is to project the potential future business growth/losses, sales shifts, and resulting employment impacts to Lenoir County's economy under each of the project alternatives.

It is difficult to quantify the different build alternatives' overall net business activity impact resulting from the combined effects of the highway use and business profitability changes. This is due partly to the varying extent that the proposed transportation improvements would benefit or adversely affect different business sectors and specific businesses' operations. It is also difficult given the important role that other factors would contribute to Lenoir County's future economy. Local planning initiatives, access to investment capital, local labor force conditions, and the general national economic performance could also play a role in determining the extent that Lenoir County might be able to achieve future economic growth.

Transportation system limitations are identified as a key constraint to the greater eastern North Carolina region's future economic development by several recent economic development studies of the region (Center for Regional Economic Competitiveness [CREC] 2012; Eastern Carolina Council 2012). However, these studies also identified numerous other constraints on the region's future economic growth, including the lack of skilled labor, low educational attainment, an aging population structure with out-migration of young adults, and infrastructure limitations. Consequently, US 70's transportation improvements must be a part of a larger strategic plan and effort for future economic development in the region to occur.

3.7.1 General Considerations

Several other considerations should be recognized when evaluating the net project-related impacts on business development.

Bypass-related future traffic and land use changes may have some adverse impacts on specific local businesses. Individual businesses may thrive or decline under their new operating circumstances and market conditions depending on their specific location, operations facilities, and resources. However, the impacts are often short-term as businesses and local economy would generally adapt to traffic changes.

The 2040 No-Build Alternative has been very conservatively defined. Despite the projected increased congestion and delays, no reduction in US 70 businesses retail or other business activity has been projected for the purposes of the 2018 EIA. It is worth noting that even minor reductions in retail activity or other business closures would offset the current net benefit conservatively attributed by the analysis to the future No-Build Alternative.

Both Alternative 1UE and Alternative 1SB may result in some reduced future retail business growth for highway market dependent businesses (compared to the 2040 No-Build Alternative). However, compared to the 2015 retail conditions, these project alternatives are still expected to result in notable retail spending growth of 13 to 19 percent.

Even minor population growth or new business attraction could outweigh the projected retail sales shift losses for Lenoir County. Similarly, successful enhancement of the community's attractiveness as a visitor destination, even if only as primarily an en route travel stop, could offset the projected retail sales shift losses.

3.7.2 Local Market Growth

No significant future population increase is projected for Kinston or Lenoir County. This is consistent with the past historical trends and current North Carolina Office of State Budget and Management (OSBM) demographic projections. In the absence of any increased highway traffic growth by local residents, future retail purchases by local residents are projected to remain unchanged over the future study period. Consequently, no local customer market expansion is expected and any retail sales growth for the region would primarily result from increases in future non-local pass-through travelers.

Manufacturing and most other non-retail/service industries would not be dependent on the local residents for their sales and consequently would not be directly affected by a lack of local market expansion. However, these businesses do depend on the local population to meet their labor needs and an aging local population without an increase in young workers would affect their productivity and discourage their business growth if they cannot easily obtain suitable employees.

Future improvement of US 70 would expand the labor pool available for Lenoir County businesses. Improved highway travel speeds would allow individuals to commute for Kinston jobs from more distant locations than they currently do. By expanding the catchment area of potential employees willing to commute for jobs in Lenoir County, businesses would have a greater selection of potential job candidates. This factor is likely to become increasingly important as worsening future US 70 travel conditions may otherwise discourage workers living outside Lenoir County to commute daily for work in Kinston.

3.7.3 US 70 Traffic Growth

Projected future US 70 traffic growth is expected to be primarily from non-local, pass-through travelers. The potential economic benefits of this traffic growth are expected to be predominantly limited to highway market dependent retail businesses.

Pass-through travelers would have little or no business interactions with local-serving retail and services. Their interactions with manufacturing and other non-retail/service industry sectors would also be negligible. Diversion of their pass-through trips should also improve local traffic conditions, which could be beneficial to local businesses (including local-serving retail and service businesses) that will gain improved access not only for their operational needs (e.g., for supplies, deliveries, and/or labor) but also for their customers (if they are a retail or service business).

3.7.4 New Business Development

The future location of any manufacturing and other non-retail/service businesses would be relatively unaffected by the build alternatives. Any future new business development by these businesses would be expected to continue to occur in western or northern Kinston in the vicinity of the current manufacturing sites particularly those with access to the C.F. Harvey Parkway. Unlike southern Lenoir County, these areas are well served by key utilities and amenities. They also benefit by being closer to Greenville and generally their properties are larger and less flood prone than southern Kinson sites.

Under both the No-Build Alternative and Alternative 1UE, the projected economic effects would continue to focus predominantly on the current US 70 corridor and its existing businesses and business clusters. The No-Build Alternative would allow and may encourage more dispersed business development on the developable properties along the US 70 corridor. If not properly managed, the new development may result in further sprawl along the corridor and there would be little incentive for removal/redevelopment of vacant or outmoded business properties since new businesses may find it cheaper to locate any new facilities on vacant properties.

As discussed in Section 3.6, Alternative 1UE would result in direct property impacts to many existing businesses along US 70. In addition, most current businesses along US 70 would continue to be in close proximity and may continue to have highway visibility. However, the location of the future interchanges would benefit some retail businesses and detract from others depending on their proximity and ease of their on/off highway access. Future business growth would likely be more focused on those properties best served by US 70's future interchanges and consequently it may also be expected that vacant or under-utilized properties in those areas would be more likely to be redeveloped. As discussed in Section 3.6, the relocation analysis identified considerable land availability in the roadway corridors of all the build alternatives. Consequently, Alternative 1UE would be expected to result in more clustered infill development that would cater to highway traffic (e.g., gas stations and restaurants) than would occur under the No-Build Alternative.

Alternative 1SB is expected to divert a substantial portion of the pass-through traffic off the existing US 70 roadway and improve its future traffic conditions. Travelers wishing to stop in Kinston would be able to continue to use the current US 70 route or choose to use the bypass. Kinston's existing US 70 business clusters and businesses would continue to be accessible for

the projected new traffic growth. In addition, clusters of development that would cater to highway traffic (e.g., gas stations and restaurants) would be encouraged near future interchange locations along Alternative 1SB. The proximity between the future interchanges and existing retail clusters would likely allow for easy on-off diversions as relocating non-stopping traffic away from the current US 70 route. While new business development would likely be most attracted to the interchange areas, Alternative 1SB would continue to support more dispersed growth along the developable areas of the current US 70 route and less incentive for redevelopment of outmoded buildings or abandoned sites.

Similar to Alternative 1SB, Alternative 51 would divert most pass-through traffic to the bypass and thereby improve the existing US 70 roadway's future traffic conditions. Travelers planning to stop in Kinston would be able to continue to use the current US 70 route. However, its bypass users would need to travel 5 to 6 miles to reach Kinston's existing US 70 business clusters. Consequently, those businesses can be expected to obtain new less "spontaneous" sales from the alternative's new traffic growth. In addition, the lack of municipal water and sewer services as well as the limited local residential population are expected to be major constraints limiting future development near Alternative 1SB's likely future interchange locations. The area's water and sewage infrastructure constraints can be expected to severely limit both size and type of any new commercial development. Furthermore, any new commercial businesses would be almost entirely dependent on bypass users for its customer base due to the area's rural setting.

CHAPTER 4
INDIRECT AND INDUCED IMPACTS

4. INDIRECT AND INDUCED IMPACTS

This EIA identifies, and where possible, quantifies project alternatives direct economic impacts, including potential retail sales shift impacts for US 70's current highway market dependent retailers and travel time savings for highway users. The retail sales shift impacts can be expected to generate secondary economic impacts. Increased sales would result in additional sales for business suppliers (indirect impacts) and greater local spending by its (and its suppliers') employees (induced impacts). Similar but negative economic impacts would occur from reduced retail businesses sales.

The commercial travel time savings can be expected to result in actual expenditure savings for those businesses since owners would benefit from reduced labor and other delivery expenses. Consequently, these savings would improve these businesses' profitability and can be reinvested into the business. The investments would likely be spent for purposes that should result in positive indirect and induced impacts on Lenoir County's economy. A similar case can be made for commuter travel time savings. Reduced commute time can enable those individuals to work additional hours and thereby increase their annual income.

It is unclear the extent that these economic benefits would correspondingly result in spending changes for the Lenoir County economy since not all individuals would use their gained time to increase their income. In addition, it is also unclear what portion of the highway user benefits would be retained with Lenoir County. These benefits would likely be shared between residents, employees, and businesses located both within and outside Lenoir County. Consequently, it was not possible to determine the extent of the savings that would occur in Lenoir County and that would result in increased local spending and economic activity. Therefore, no direct, indirect, or induced economic impacts were attributed to the project's travel time savings and safety benefits.

Future improvement of US 70 may also be expected to play an important role in improving Lenoir County's business competitiveness and enhancing its attractiveness as a business location, both of which might in turn encourage increased business growth and attract new local development opportunities. These effects represent potential indirect development benefits that may be partly attributable to the future improvement of US 70. However, since the project-related business profitability improvement benefits cannot be quantified, no related indirect impacts were quantified.

4.1 IMPLAN MODELLING

IMPLAN modeling was used in the 2016 EIA to estimate the indirect and induced economic impacts expected to result from project-related future retail sales shift impacts. IMPLAN is an economic modeling tool that is commonly used to measure the economic impact of economic changes that might occur from major infrastructure project such as the proposed Kinston Bypass. IMPLAN is an input-output model and as such it considers the output or service of one industry as an input of another. These types of input-output relationships provide the financial measurement of any changes in economic activity as it flows from one entity (industry, government, or household) to another.

The results of input-output analyses are typically measured and interpreted using multipliers. These multipliers are indices that provide a measure of relative economic activity in the particular model. For example, an employment multiplier of 2.0, means that for every job in the firm, one additional job in the region is created through that firm's economic relationship to the remainder of the economy. Conversely, if the multiplier is 1.25, only one quarter of a new position is created in the area for that initial job.

It is important to note that the multipliers generated by IMPLAN vary by region. This means that the impact of an economic event will be different between counties. The variance is largely due to the difference in the industries that drive the local economy. For example, events in more urbanized communities would typically generate a larger impact than an identical event occurring in a more rural community. This result is due to the fact that more goods and services demanded by the organization and its employees are likely to be available in a larger, more developed and diversified region.

IMPLAN provides three different types of transactional effects: direct, indirect, and induced. Direct effects measure the changes that occur in the industry due to the activity of the project (i.e., the employment or value of services provided by the industry in question). Indirect effects, or supplier effects, are the changes that result as industries conduct business with one another (i.e., the companies providing contract services to the retailer or the companies from which the retailer buys its supplies). Induced effects measure household spending as a result of wages earned from the direct and indirect effects (i.e., the local spending patterns based on the income earned by the employees of the firm and its suppliers). The total effect multiplier represents the combined economic impacts of all three of these transactional effects into a single multiplier.

IMPLAN provides four categories of effects: employment, labor income, value added, and output. Employment is the number of workers, while Labor Income is the compensation (wages, salary, and benefits) they receive. Value added includes wages, property income, and indirect business taxes created by the industry. The final IMPLAN measurement is for total industry output, which is a measurement of the total value of production or sales. This number relates to the total regional (or county) product, which is the regional (or local) equivalent of the nation's gross domestic product.

Given the negligible changes in Lenoir County's economy since 2015, the 2018 EIA used the same IMPLAN multipliers to estimate the indirect and induced economic impacts of the updated sales shift projections.

4.2 RESULTS

Table 4-1 shows the highway market dependent businesses analyzed by the 2018 EIA's sales shift analysis and their respective IMPLAN multipliers. Highway market dependent retail businesses consist of those businesses that have a substantial market dependence on US 70 for their customers. These businesses include food services and drinking places (restaurants), food and beverage stores (grocery stores or mini-marts), gasoline stations, and general merchandise stores (e.g., Walmart).

Using food services and drinking places as an example, the employment multiplier of 1.148 (Table 4-1) indicates that, for every job created (or lost) in this industry, another 0.148 jobs would be created (or lost) elsewhere in Lenoir County. Similarly, the labor income multiplier

indicates that, for every 100 dollars of labor income created (or lost), an estimated $34 of additional indirect and/or induced labor income gained (or lost) elsewhere in Lenoir County.

Table 4-1: Lenoir County total effect multipliers (2014)

Impact Type	Employment	Labor Income	Value Added	Output
Generated by Sales				
Food services and drinking places	1.148	1.339	1.381	1.320
Retail – food and beverage	1.180	1.274	1.340	1.363
Retail – gasoline stations	1.264	1.244	1.313	1.363
Retail – general merchandise	1.169	1.253	1.282	1.329

Sources: ECUBBR 2015; MIG Inc. 2014

Each industry sector has different multipliers determined by its economic productivity, specific economic characteristics (such as average employee salaries), and interrelationships to other local industries (e.g., suppliers).

As previously discussed, future sales shift impacts are conservative estimates of the build alternatives' potential direct adverse economic impacts and likely overstate the magnitude of the reduced future retail growth compared to the No-Build Alternative.

Future economic and employment growth compared to current baseline conditions is projected under all the 2040 alternatives. However, given the impact analysis's conservative economic assumptions that future economic growth would not be notably impaired under the No-Build Alternative, the greatest economic growth is projected under the 2040 No-Build Alternative. Consequently, future economic growth under all the build alternatives is projected to be more limited than that which could potentially occur under the 2040 No-Build Alternative. In other words, while future economic growth would still be expected to occur under the build alternatives, that growth but would be expected not to be as high as it could be under the No-Build Alternative (given the economic assumptions).

As shown in Section 3.5, the direct impact of the projected net reduction in future retail sales growth for Lenoir County's 2040 economy is estimated to vary from $6.7 to $19 million dollars (in 2016 $) between the three build alternatives. In addition, the projected reductions in future sales growth would have additional adverse indirect and induced economic impacts on Lenoir County from the related decreased business activity for the retailers' suppliers and other related businesses as well as less income (and hence consumer spending) for the affected retailers' employees. Table 4-2 shows the estimated direct, indirect, induced, and total economic impact to Lenoir County using the IMPLAN multipliers.

Overall, Alternative 51 is projected to result in the least change to future job growth due to the largest increase in ADT.

Table 4-2: Projected total net economic impacts for sales shift (2040) (2016 $; $ millions)[a]

Impact Type	Employment	Labor Income	Value Added	Output
Alternative 1UE				
Direct Effect	−110.3	($2.3)	($3.3)	($6.0)
Indirect Effect	−7.9	($0.3)	($0.5)	($0.9)
Induced Effect	−10.0	($0.3)	($0.6)	($1.0)
Total Effect	−128.3	($3.0)	($4.5)	($8.0)
Alternative 1SB				
Direct Effect	−38.7	($0.8)	($1.2)	($2.1)
Indirect Effect	−2.8	($0.1)	($0.2)	($0.3)
Induced Effect	−3.5	($0.1)	($0.2)	($0.4)
Total Effect	−45.0	($1.0)	($1.6)	($2.8)
Alternative 51				
Direct Effect	−68.8	($1.4)	($2.1)	($3.7)
Indirect Effect	−5.0	($0.2)	($0.3)	($0.6)
Induced Effect	−6.3	($0.2)	($0.4)	($0.7)
Total Effect	−80.1	($1.8)	($2.8)	($5.0)

Source: AECOM 2017.

[a] Net impacts based on comparison with projected 2040 No-Build Alternative conditions.

The unrealized job growth (i.e., that would be expected to occur under the future No-Build Alternative [2040]) would otherwise mostly occur in the retail and food service industries where jobs are generally lower paying. These jobs are also often part-time positions that typically provide few employment benefits. Therefore, any employment gains in other business sectors might be expected to generate greater per capita economic benefits than those from highway market dependent retail businesses.

In all cases, the highway market dependent retail sectors' indirect and induced impacts are minor. This indicates that Lenoir County's economy is highly dependent on imports for most of its economic activity and that the businesses directly impacted by the build alternatives would account for only a limited portion of the county's overall economy.

CHAPTER 5
SUMMARY OF FINDINGS

5. SUMMARY OF FINDINGS

Table 5-1 provides a summary of the traffic projections and EIA findings for the major impact categories.

Many of the build alternatives' potential economic benefits cannot be quantified. The current traffic modeling does not provide information to determine the future improvements in travel time reliability. Another important consideration is that there is currently insufficient data to estimate the comparably higher economic costs for Alternative 1UE (both from business interruption during construction and business displacement/relocation).

Future construction of the alternatives would have short-term economic benefits in local employment and spending. However, these benefits are not included in the EIA as an additional net benefit of the project compared to the No-Build Alternative primarily as a conservative assumption so as not to overly favor future roadway development based on the project's ability to secure construction spending that would result in only temporary economic gains for Lenoir County. In addition, due to the similarity of the alternatives' construction cost estimates, potential cost savings is not considered an important consideration for weighting the EIA results. As a result, the alternatives' construction costs are not included in the EIA estimates of the alternatives' economic benefits.

In cases where the project's impacts are less direct (e.g., profitability benefits from larger market and labor catchments areas), it is also difficult to determine the specific contribution that can be attributed to project-related effects. Similarly, the project's potential future economic development benefits would also be dependent on other contributing factors (e.g., city planning, capital availability).

Consequently, it is difficult to precisely and fully determine each project alternative's total net benefits. Nonetheless, the 2018 EIA findings indicate that the project's potential retail sales shifts are minor and could readily be offset with other new business growth by successful marketing, planning, and other development efforts. In addition, the build alternatives may be expected to facilitate such business growth and/or business retention.

Furthermore, the 2018 EIA conservatively assumes that under the 2040 No-Build baseline conditions, future retail business growth would not be negatively impacted despite its projected worsening future travel conditions.

Table 5-1: Summary of impacts by project alternative (2016 $; $ millions)

Impacts	Existing US 70 Alternatives		Bypass Alternatives	
	No-Build (Baseline)	Alternative 1UE	Alternative 1SB	Alternative 51
Average Daily Traffic (2040)				
US 70	57,900	58,700	29,400	29,700
Bypass	-	-	29,200	30,500 [a]
Total	57,900	58,700	58,600	60,200

Impacts	Existing US 70 Alternatives		Bypass Alternatives	
	No-Build (Baseline)	Alternative 1UE	Alternative 1SB	Alternative 51
Net Annual Traffic Growth (2015 to 2040)				
Local	0	0	0	0
Non-Local	4,980,000	5,270,000	5,240,000	5,850,000
Total	4,980,000	5,270,000	5,240,000	5,850,000
Sales Shift Impacts Relative to No-Build (2040) [b]				
Annual (2040)	-	($19.1)	($6.7)	($11.9)
Cumulative (2025 to 2044) (NPV at 3%)	-	($353.4)	($117.6)	($211.6)
Total Effect: Employment	-	−128.3	−45	−80.1
Total Effect: Labor Income	-	($3.0)	($1.0)	($1.8)
Total Effect: Value Added	-	($4.5)	($1.6)	($2.8)
Total Effect: Output	-	($8.0)	($2.8)	($5.0)
Travel Time Savings Relative to No-Build				
Annual (2040)	-	$17.5	$13.1	$8.0
Cumulative (2025 to 2044) (NPV at 3%)	-	$182.3	$134.4	$80.8
Other Highway User Benefits Relative to No-Build				
Fuel savings	-	Highest	Medium	< Medium (Slightly)
	-	Most direct route; no stoplights on US 70	Minor route increase; stoplights on US 70	Greatest route increase; stoplights on US 70
VMT Cost				
Annual (2040)	-	$0	($1.2)	($3.2)
Cumulative (2025 to 2044) (NPV at 3%)	-	$0	($12.7)	($34.1)
Safety Improvement				

Impacts	Existing US 70 Alternatives		Bypass Alternatives	
	No-Build (Baseline)	Alternative 1UE	Alternative 1SB	Alternative 51
Annual (2040)	-	$20.5	$15.2	$11.4
Cumulative (2025 to 2044) (NPV at3%)	-	$220.2	$161.7	$119.8
System Capacity Benefits from Average Daily Trip Growth				
Annual (2040)	-	$1.7	$1.2	$4.2
Cumulative (2025 to 2044) (NPV at 3%)	-	$19.1	$12.7	$34.0
Improved reliability	-	Medium; Highest increased average speeds; reduced accidents	Highest; Increased average speeds; reduced accidents; alternate route for delays	
Annual Total Net Benefits (Quantified 2040)	-	$20.6	$21.5	$8.0
Cumulative Total Net Benefits (Quantified 2025 to 2044) (NPV at 3%)	-	$66.2	$177.2	($14.7)
Business Performance				
Business profitability	Reduced financial performance	Improved financial performance and competitiveness		
Revenue impacts	Reduced market area	Increased market area		
Cost impacts	Higher delivery costs	Lower transportation costs		
	Reduced labor pool	Increased labor force catchment area		

Impacts	Existing US 70 Alternatives		Bypass Alternatives	
	No-Build (Baseline)	Alternative 1UE	Alternative 1SB	Alternative 51
Existing businesses land use and access	Conservatively assumed no adverse sales impacts from degraded US 70 travel conditions	270 acres of farmland impacts are possible ($88,000 net revenue loss); US 70 access limited to interchanges; potential encroachment and reduced site access	464 acres of farmland impacts are possible ($150,000 net revenue loss); no site access changes; US 70 travel conditions improved	743 acres of farmland impacts are possible ($242,000 net revenue loss); no site access changes; US 70 travel conditions improved
Business Development				
Local market growth	None projected			
US 70 traffic growth	Increased future pass-through traffic results in limited retail sales/business growth			
New business development	Retail growth limited and focused on US 70	Retail growth limited and focused on future US 70 interchange locations	Retail growth limited. US 70 growth/relocation also possible. Infill business growth likely at bypass interchanges	Minimal net retail growth. Very limited infill business growth due to poor amenities and negligible nearby market. US 70 growth also possible
	Non-retail growth potentially constrained by worsened US 70 travel conditions	Non-retail growth encouraged by improved US 70 travel conditions and enhanced businesses' competitiveness		

[a] Includes induced trips by local southern Lenoir County residents to out of region destinations.

[b] The sales shift impacts represent the projected net retail and service sales that may be lost or transferred to businesses outside the market area under the build alternatives (compared to the No-Build Alternative).

As Table 5-1 shows, the build alternatives would result in a variety of economic benefits for both the Lenoir County and North Carolina economy. The project's primary purpose is to improve regional mobility, connectivity, and capacity for US 70 between La Grange and Dover in a manner that meets the intent of the North Carolina Strategic Transportation Corridors policy

(NCDOT 2015a). The following sections briefly summarize the project's major benefits, adverse impacts, and net economic benefits.

5.1 PROJECT BENEFITS

As part of US 70's system-wide improvement, the Kinston Bypass project is expected to benefit both the eastern North Carolina region and the entire state by improving its east-west connectivity. System-wide US 70 improvements would reduce the future travel time between Kinston to Raleigh from 126 minutes (2040 No-Build conditions) to only 70 minutes. Similarly, Kinston's access to I-95 would be reduced on average from 65 to 50 minutes (23 percent decrease) (Cambridge Systematics 2014).

However, this EIA is focused on evaluating the economic impacts on Lenoir County from the proposed US 70 Kinston Bypass (STIP R-2553). Three major types of impacts have been evaluated: highway user, business performance, and business development impacts.

Highway user benefits include travel time savings with an estimated annual value of between $8.0 million and $17.5 million per year in 2040 for highway users. Future reduced accident costs are estimated to result in potential net highway safety benefits of between $11.4 million and $20.5 million per year. While an increase in projected VMT from longer distances is estimated to result in potential net costs of between $0 and $3.2 million per year, future benefits from growth are estimated to result in potential net benefits of between $1.1 and $3.8 million per year.

Several other highway user benefits have been qualitatively assessed. Better travel conditions would reduce vehicle fuel use, resulting in direct travel cost savings and environmental benefits from reduced greenhouse gas emissions and improved air quality conditions. The project would also result in greater travel time reliability and trip predictability, enabling highway users to reduce unneeded buffer time for their trips.

Business performance benefits are expected from the reduced travel times, fuel, and accident expenses. The transportation cost savings for businesses would improve their profitability. Improved travel times may also extend businesses' market area reach and increase its potential labor force catchment area. Both factors could positively affect local businesses' sales opportunities and production costs.

Since the project-related improvements are not quantified and without similarly projecting the corresponding traffic changes for its competitors, it is difficult to determine the net effects on Lenoir County's business competitiveness and business development potential. However, at a minimum the build alternatives may be expected to improve Lenoir County's business competitiveness and business development potential compared to existing conditions and the No-Build Alternative. Improved highway accessibility would both enhance GTP's ability to attract new business growth and may help support continued efforts for downtown Kinston's revitalization. While Lenoir County's future population is projected to remain relatively unchanged, future US 70 traffic growth can be expected to result in minor future retail growth of up to $50 million in annual retail sales for highway market dependent retail businesses along US 70 and/or at future US 70 interchanges. The expected sales shift is estimated to result in potential net sales reductions of between $6.7 million and $19.1 million per year.

5.2 ADVERSE PROJECT IMPACTS

The primary adverse impact to Lenoir County would be a potential reduction in future retail business growth among its highway market dependent retail businesses (e.g., gas stations, convenience stores, and food restaurants).

Lenoir County's future population is projected to remain relatively unchanged and consequently no local retail growth is projected to occur. However, depending on the alternative, future non-local traffic growth of between 5.2 and 5.9 million vehicles is projected to occur. The traffic growth is projected to result in up to $50 million in net retail growth (compared to 2015 sales) for Kinston's highway market dependent retailers. The magnitude and location of the future retail growth would vary among alternatives due to their location and extent that they divert future pass-through traffic away from the existing US 70 businesses.

For the purposes of the EIA, conservative retail sales assumptions have been adopted for the No-Build Alternative. Despite degraded future travel conditions and increased peak period congestion, future sales under the No-Build Alternative are assumed to increase proportionally based on the projected new non-local traffic growth.

Given future unimpeded growth in Kinston's baseline retail sales conditions, the build alternatives are projected to result in net sales shift reductions for highway market dependent retail businesses. It is important to recognize that if the No-Build Alternative resulted in even a minor reduction in highway users' stopping rates or per vehicle spending its future retail sales projections would decrease. For example, a 5 percent reduction in travelers willing to stop due to peak congestion delays would instead result in a projected net sales growth for Alternative 1UE. Similarly, the net sales shifts projected for Alternatives 1SB and 51 would also be reduced.

Alternative 1UE would continue to focus future retail development along the existing US 70 corridor. However, the new controlled access highway would reduce access to businesses not located at the future interchange locations. Some existing businesses may be displaced or face encroachment as a result of Alternative 1UE's expanded right-of-way access and new frontage roads.

Alternative 1SB would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately three quarters of a mile south of the existing US 70 in Kinston. As this route is only one minute faster, any travelers interested in stopping would be expected to divert before the bypass and travel along the existing US 70 route. In addition, it is likely that new infill commercial development may be attracted to the interchanges as a secondary focus for future retail development.

Alternative 51 would divert more than 50 percent of the pass-through traffic to the bypass, which would be located approximately 4 or 5 miles south of the existing US 70 in Kinston. However, as this route is less than two minutes faster, any travelers interested in stopping would be expected to divert before the bypass and travel along the existing US 70 route. The lack of any nearby existing (or likely future) residential or commercial development would also limit the local market support for any new businesses located at its interchanges. Furthermore, the lack of any supporting utilities in the area would also be a major constraint on new business development at the bypass's interchange locations. Furthermore, if only limited future business development at Alternative 51's interchanges occurs, then travelers may instead be more inclined stop and make

their purchases at other businesses in adjoining Wayne or Craven counties. In which case, any such increase in sales leakage would further increase the sales shift losses for Lenoir County's economy.

In any case it should be recognized that the projected sales shift impacts are reductions in projected future retail growth. As such, they do not represent any actual net loss compared to Lenoir County's current retail economy.

5.3 NET BENEFITS

Since many of the potential economic benefits associated with the build alternatives cannot be quantified, it is difficult to comprehensively determine each alternative's overall net benefits. The EIA findings indicate that the alternatives' potential retail sales shifts are minor and could be readily offset by other new business growth in Lenoir County resulting from successful marketing, planning, and other development efforts. The projected future sales shift impacts are based on a comparison with a very conservative No-Build Alternative as the future baseline conditions. The EIA conservatively did not attribute any decrease in future retail sales or other business activity despite projected major declines in US 70's future travel conditions. If even a very minor proportion of US 70 users or local residents are discouraged from stopping at Kinston's retail businesses in the future as a result of the increased congestion, then the build alternatives' actual sales shift impacts would be reduced and might actually result in retail sales growth compared to the No-Build Alternative.

As discussed in Chapter 3, the build alternatives should encourage/facilitate future business growth and/or business retention. Again, even minor increased future new business and/or population growth could offset the minor projected sales shift impacts conservatively attributed to the build alternatives.

Alternative 51 would provide the least overall net economic benefit for Lenoir County since there would be no notable connectivity between its interchanges and US 70 existing retail clusters. In addition, future business development along the bypass route is difficult and unlikely and has the least safety and VHT benefits of the build alternatives. The annual and cumulative benefits in 2040 and 2025 to 2044 based on sales shift, ADT growth, and VHT, VMT, and safety benefits are projected to increase by $8.0 million and decrease $14.7 million compared to the No-Build Alternative, respectively. Alternative 51 would have the smallest number of business relocations (26), of which 12 would be highway market dependent.

Alternative 1SB is projected to result in the largest net economic benefit to Lenoir County of all the project alternatives. Alternative 1SB is projected to result in a net positive impact on Lenoir County compared to the No-Build Alternative. The annual and cumulative benefits in 2040 and 2025 to 2044 based on sales shift, ADT growth, and VHT, VMT, and safety benefits are projected to increase by $21.5 million and $177.2 million compared to the No-Build Alternative, respectively. Alternative 1SB would have the second smallest number of business relocations (66), of which 61 would be highway market dependent.

Alternative 1UE is projected to result in future overall net economic benefit for Lenoir County more than those conservatively attributed to the No-Build Alternative. The annual and cumulative benefits in 2040 and 2025 to 2044 based on sales shift, ADT growth, and VHT,

VMT, and safety benefits are projected to increase by $20.6 million and $66.2 million compared to the No-Build Alternative, respectively.

It should be recognized that the EIA could not identify or estimate any site-specific impacts for Alternative 1UE. It is expected that US 70's current major retail clusters would remain accessible to highway users. Although Alternative 1UE's route would be unchanged, direct access to most businesses would be prohibited as highway users would only be able to enter/exit at the interchange locations. Finally, the EIA does not include the short-term adverse economic impacts on the US 70 businesses from construction-related disruption and congestion that would not occur under Alternatives 1SB and 51.

While the magnitude and value of the various potential site-specific impacts could not be determined at this stage of planning, altogether the short-term and long-term site-specific impacts could potentially exceed Alternative 1UE's projected net benefits. The potential for the site-specific impacts to offset Alternative 1UE's projected benefits would be greater if Lenoir County continues to experience low to no economic growth in the future.

US 70's current major retail clusters would be expected to still remain readily accessible to highway users and the existing businesses and their access would be unaffected. Alternative 1SB may be expected to encourage some future new infill development at its development and interchanges and would not substantially affect any of the existing US 70 business properties.

From both the narrow economic perspective that only considers sales shift, ADT growth, and VHT, VMT, and safety benefits, and a wider analysis that also considers the qualitative benefits and unquantified costs, Alternative 1SB is considered and recommended as the most beneficial project alternative for Lenoir County over the long term. Numerous key factors differentiate the Alternative 1SB from Alternative 1UE.

- Alternative 1SB would not result in any significant physical impacts on US 70's existing businesses from encroachment or redesign of the local street system.
- Significantly greater (although temporary) business interruption impacts can be expected from Alternative 1UE.
- Alternative 1UE would require major reconfiguration of the local roadway system (including new frontage roads and property access points). Given its greater development and site constraints, the requirements and costs for the supporting infrastructure may be expected to be higher than for the other build alternatives. As a result, this would likely result not only additional project costs but also property and access changes to existing US 70 businesses that would be avoided under Alternative 1SB and Alternative 51.
- Alternative 1SB would have more limited physical impacts on the businesses within its footprint and offers greater economic development growth potential for both the existing US 70 business corridor and those sites with good access to its future interchanges. These findings are consistent with the general consensus from the public outreach efforts, which overall reported a preference for Alternative 1SB.

CHAPTER 6
REFERENCES

6. REFERENCES

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APPENDICES

APPENDIX A – UPDATED EXISTING CONDITIONS

EXISTING CONDITIONS

The project study area's current socioeconomic, market, and traffic conditions were identified and assessed. For the socioeconomic analysis, indicators such as population growth, age, employment, educational attainment, and wage levels were evaluated. Based on these analysis findings, the strengths and weaknesses of the City of Kinston and Lenoir County's economies were assessed. Furthermore, their socioeconomic conditions were compared with neighboring regions to understand which socioeconomic factors are specific to Kinston/Lenoir County and those that are typical of the greater eastern North Carolina region. This analysis helped identify common regional challenges and local successes that can be emulated. Current traffic volume data and travel conditions information were also used to estimate the local economic activity generated by US 70.

PROJECT STUDY AREA

The EIA project study area consists predominantly of Lenoir County. Short sections of the build alternatives extend into portions of Craven and Jones counties, which are sparsely populated or unpopulated areas. All of the economic activity that could be directly affected by the representative project alternatives is in Lenoir County and more specifically in the City of Kinston. Consequently, the EIA focuses on analyzing the economic impacts to Lenoir County and the City of Kinston.

Kinston is one of the oldest cities in the State of North Carolina and the region's economy has historically been based primarily on agriculture and manufacturing. During the late nineteenth century, the City of Kinston experienced rapid growth with the expansion of the cotton and tobacco industry, and the region became a prominent trading center for these commodities. By the early part of the 20th century investments started pouring into processing and manufacturing facilities. This period marked the introduction of manufacturing as a significant industry sector in Kinston. Further growth occurred in the 1950s with the arrival of DuPont, which helped increase the city's population by more than 5,000 residents.

This period of strong economic growth ended soon after textile production shifted overseas beginning in the 1970s (Conway et al. 2003). Since then, the region's economy has been fairly stagnant. In recent years, efforts have been made to reinvigorate the local economy and include promoting the region for historical tourism and as a regional medical center. Most notably, there has been a major push to make the region's North Carolina Global TransPark (GTP), a logistical hub based on the city's central location on the east coast with easy access to major markets. In 1992, the North Carolina General Assembly designated the Kinston Regional Jetport as the site for GTP, the state-funded development project based on its access to air, rail, and highways. When founded, the GTP was anticipated to become a major economic driver for eastern North Carolina; however, growth has been slower than expected. While the GTP has not yet induced the level of development originally anticipated, it is expected to increase business, commercial, and residential development in the area over time and provides the city leaders with hopes that Kinston once again will play an important role in the manufacturing sector and will help attract

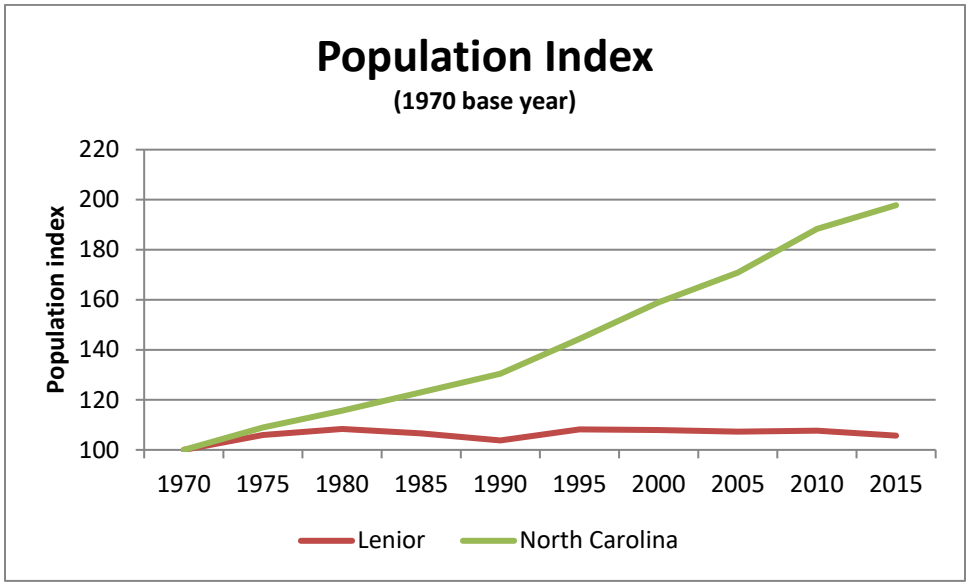
aerospace, emergency services, defense contracting, and other supporting industries to revitalize Kinston's economy. To date, the biggest tenant to locate to GTP is Spirit Aerosystems, which opened in 2008 and employs close to 500 employees.

POPULATION

Lenoir County's 2016 population is 57,587 of which 20,672 are Kinston residents. Figure A-1 shows the growth of the state of North Carolina in comparison to Lenoir County indexed to the population in 1970. If Lenoir County had increased at the average statewide population growth rate it would currently have approximately 53,700 more residents and its population would be larger than neighboring Craven County. However, Lenoir County is nearly unchanged from its 1970 levels. Between 2000 and 2016, Lenoir County's population decreased by 3.3 percent (OSBM 2017.A). Over the same period Jones County, its neighbor to the southeast, increased by 2 percent while Craven County grew by 0.2 percent (OSBM 2017.A).

In Figure A-1, the populations and growth rates have been normalized, where 100 is the base total (or index value) for the comparison of growth rates between Lenoir County and North Carolina.

Figure A-1: Lenoir County population growth index (1970–2015)



Source: Office of State Budget and Management (OSBM) 2016.

Table A-1 provides population forecasts for the state and the three counties (Craven, Jones, and Lenoir) between 2016 and 2037. Over this future time period, Lenoir County's population is projected to slightly decrease at a rate of −0.2 percent per year. Jones and Craven County's population estimate is projected to remain constant. Population projections for the State of North Carolina, in comparison, forecast a 1.1 percent annual increase resulting in a 23.6 percent increase in the state's population by 2037. A large portion of this future growth is expected to result from future in-migration.

Table A-1: Population growth forecasts

Area	Population		Growth		
	2016	2037	Difference	Percent Change	Annualized Growth Rate
Lenoir County	57,587	55,275	-2,312	-4.0%	-0.2%
Craven County	103,737	104,109	372	0.4%	0.0%
Jones County	10,354	10,355	1	0.0%	0.0%
North Carolina	10,155,942	12,553,271	2,397,329	23.6%	1.1%

Sources: OSBM 2017.B, OSBM 2017.C

While the OSBM projects that Lenoir County population will decrease slowly over the next two decades, this could change if the GTP and/or Lenoir County are able to attract major new business development to the area. When it was first developed, the GTP was expected to stimulate economic development and population growth in Lenoir County due to an increase in local employment opportunities. Projections made in 2000 estimated that the population of Lenoir County would increase substantially by 2012. However, GTP's slower growth and restructuring of manufacturing sector have also contributed to Lenoir County's stagnant population levels. This analysis assumes no growth over the next 20 years.

Currently 23 percent of Lenoir County's population is under the age of 18, which is equal to the statewide percentage (Table A-2). However, 20 percent of the county's population is over 65 years old, which is slightly higher than the statewide proportion of 15 percent. Lenoir County's smaller proportion of working age adults is likely a reflection of the county's limited employment base, and high propensity of its working age population to migrate to other regions which offer better and more diverse employment opportunities.

Table A-2: Age characteristics (2016)

Area	Under 18 Years	19 to 64 Years	65 Years and Older
Lenoir County	23%	58%	19%
Craven County	22%	60%	18%
Jones County	19%	60%	21%
North Carolina	23%	62%	15%

Source: American Community Survey 2017

Lenoir County also lags behind in terms of high school graduates with only 55 percent of its population being a high school graduate or higher, compared with the 86 percent for the state (Table A-3).

Table A-3: Educational attainment (2015)

Area	High School Graduate or Higher	Bachelor's Degree or Higher
Lenoir County	80%	13%
Craven County	87%	22%
Jones County	82%	13%
North Carolina	86%	28%

Source: American Community Survey 2017 B.

Lenoir County's low educational attainment rates limit its residents' earning potential and results in lower median income as its employment is more highly concentrated in lower skill jobs.

Earnings and Income

Table A-4 compares the per capita earnings and poverty rates for Lenoir County, the neighboring counties, and the state. The current median income in Lenoir County is $20,773. In comparison, the median income for North Carolina is significantly higher at $26,779. Similar differences in income, the poverty rate and other wealth indicators all reflect the same trend that Lenoir County is economically lagging behind its neighboring counties and the state. Lenoir County has a 21 percent poverty rate, which is higher than North Carolina's 15 percent poverty rate.

Table A-4: Median earnings and poverty in 2016 (2016 $)

Area	Median Earnings (per worker)	Population under Poverty Level
Lenoir County	$20,773	21%
Craven County	$25,230	15%
Jones County	$20,348	22%
North Carolina	$26,779	15%
United States	$29,829	13%

Source: American Community Survey 2017 C.

Household income includes both earnings from employment as well as government payments or money received from investments. Between 2011 and 2015, the median household income, of Lenoir County residents was $34,717 which was approximately 26 percent less than North Carolina's $46,868 statewide average.

Employment

Table A-5 compares the labor force data and unemployment rate for Lenoir County, the neighboring counties, and the state. Approximately 49 percent of Lenoir County's population is in the labor force with an unemployment rate of 4.6percent (U.S. Bureau of Statistics 2017) and comparable to the North Carolina rates.

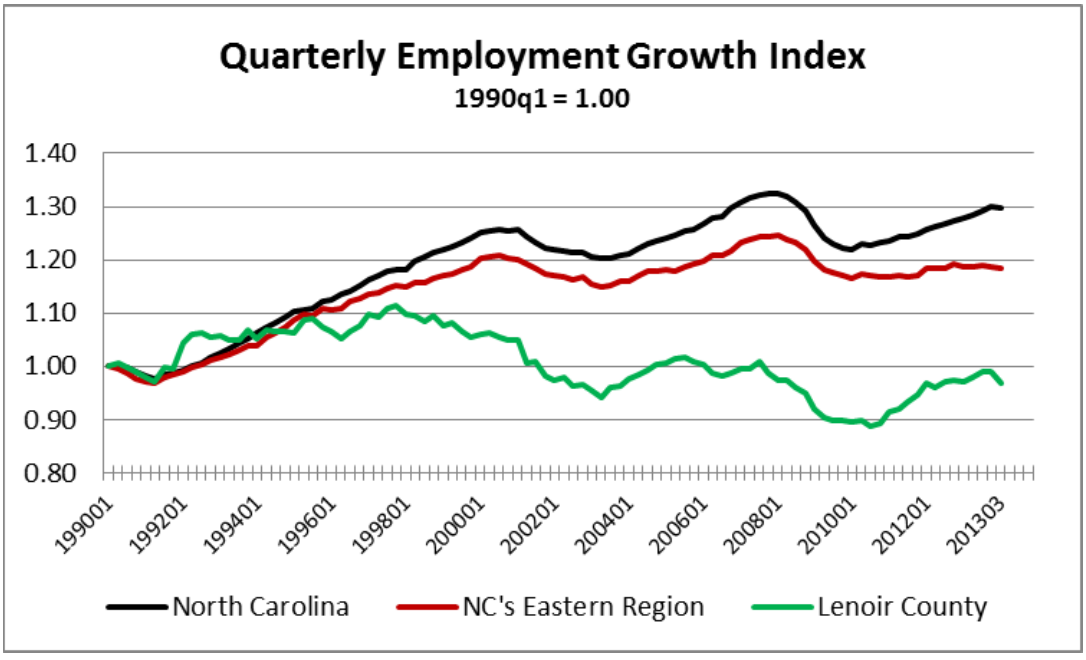
Table A-5: Unemployment rates in 2015

	2000	2005	2010	2015	2017
Craven County	4.1	4.7	10.7	6.1	4.7
Jones County	4.5	4.9	11.2	5.8	4.5
Lenoir County	5.2	5.8	11.9	6.3	4.6
North Carolina	3.7%	5.2%	10.8%	5.7%	4.6%

Source: NC Bureau of Labor Statistics.

Figure A-2 shows the 1990 indexed quarterly employment growth of Lenoir County, North Carolina, and the eastern region of North Carolina. It shows that the state has had the highest growth with the eastern region slightly lagging behind it, while Lenoir County has had almost no change in employment since 1990; this mirrors the finding of the population growth over time with Lenoir County having little growth over the same period of time. Table A-6 shows the current employment by industry for Kinston. Educational, health and social assistance services, manufacturing, and retail trade are the largest employers in the city with over half the city's workers engaged in these industry sectors. Other important industry sectors are construction, and arts and entertainment. Educational services and healthcare (25 percent), manufacturing (17 percent), and retail trade (14 percent) are Kinston's three largest employment sectors.

Figure A-2: Employment growth index (1990–2013)



Source: ECUBBR 2015

Table A-6: Employment by industry sector in Lenoir County (2015)

Industry	Employment Share
Agriculture, forestry, fishing and hunting, and mining	4.4%
Construction	7.3%
Manufacturing	17.4%
Wholesale trade	2.2%
Retail trade	13.9%
Transportation and warehousing, and utilities	3.1%
Information	0.9%
Finance and insurance, and real estate and rental and leasing	2.7%
Educational services, and health care and social assistance	24.5%
Professional, scientific, and management, and administrative	6.2%
Arts, entertainment, recreation, accommodation and food services	7.4%
Other services, except public administration	4.7%
Public administration	5.2%

Source: American Community Survey 2015 E.

Major Employers

Table A-7 lists the 25 largest employers in Lenoir County. Ten of the businesses are listed as manufacturing, showing that Lenoir County is still heavily dependent upon its manufacturing industries.

Table A-7: Largest employers in Lenoir County (2016)

Business Name	Industry
Employers with 1,000 Jobs or more	
Sanderson Farms Inc.	Manufacturing
State of NC Dept. of Health & Human Services	Public Administration
Lenoir County Public Schools	Education & Health Services
Employers with 500 to 999 Jobs	
Smithfield Foods Inc.	Manufacturing
Lenoir Memorial Hospital, Inc.	Education & Health Services
Spirit Aerosystems	Manufacturing
Aristofraft/Decora/Schrock	Manufacturing
County Administration	Public Administration
Electrolux Home Products Inc.	Manufacturing
Employers with 250 to 499 Jobs	

Business Name	Industry
City of Kinston	Public Administration
Lenoir Community College	Education & Health Services
West Pharmaceutical Services Inc.	Manufacturing
Crown Equipment Corporation	Manufacturing
Rha Health Services LLC	Education & Health Services
Pactiv LLC	Trade, Transportation, & Utilities
Wal-Mart Associates Inc.	Trade, Transportation, & Utilities
Personnel Outsource Solutions Inc.	Professional & Business Services
Advance Security	Professional & Business Services
Lenox Corporation	Manufacturing
Employers with 100 to 249 Jobs	
T & D Solutions LLC	Construction
Food Lion	Trade, Transportation, & Utilities
Principle Long Term Care Inc.	Education & Health Services
Associated Materials Inc.	Manufacturing
Exela Pharma Sciences LLC (Prior) G	Manufacturing
Bojangles Famous Chicken & Biscuits	Leisure & Hospitality

Nearly all of Lenoir County's major employers are located within 2 miles of US 70. It has been reported that 2,000 of Kinston's jobs are located within ¼ mile of the US 70 centerline (Cambridge Systematics 2014).

Commuting

According to the 2011-2015 American Community Survey, 90 percent of Kinston's population commutes to work by motor vehicle, similar to North Carolina's 91 percent. Alternative modes of commute like public transportation, cycling, and walking account for only 10 percent of commuter trips.

Kinston residents' average commute time is 16.8 minutes, which is lower than the 23.9 minutes statewide average. In Kinston, 10 percent of residents do not own a vehicle, which is substantially higher than the statewide average (less than 3 percent). Table A-8 shows average commute times in the region.

Table A-8: Average commute time (2015)

Area	Average Commute Time (in minutes)
Kinston	16.8
Lenoir County	21.5
Craven County	20.8
Jones County	25.5
North Carolina	23.9

Source: American Community Survey 2015 F.

Sales

Table A-9 summarizes the average wholesale, retail, and accommodation and food sector sales experienced in Lenoir County and surrounding areas. In Lenoir County, retail sales and accommodation and food service sales are some of the largest employing industries, employing 13.9 percent and 7.4 percent of the city's population respectively (see Table A-6). In comparison, wholesale trade employs only 2.2 percent of the County's population.

Lenoir County's retail sales account for 0.6 percent of total statewide retail sales while Craven County generated 1.0 percent of the statewide sales. Lenoir County has 0.62 percent of the state's population and 1.09 percent live in Craven County. This indicates that there is currently greater retail sales "leakage" from Craven County than Lenoir County. When its lower average income levels are factored in, Lenoir County's retail sector is attracting sales from non-residents. However, Lenoir County's 0.42 percent share of total statewide food and lodging sales indicates a relative weakness in its sector's performance.

Table A-9: Sales Information (2012) ($ 2016)

	Wholesale Trade ($ millions)	Retail ($ millions)	Food and Lodging ($ millions)
Lenoir County	$500.0	$762.0	$81.9
Craven County	n/a (a)	$1,268.6	$164.5 (b)
Jones County	n/a (a)	$35.2	n/a (a)
North Carolina	$110,049.8	$126,164.3	$19,466.8

Note: (a) Unreported to avoid disclosure of confidential information.
(a) 2012 data unreported and 2007 data shown for comparison purposes.
Source: US Census, Economic Census (2012)

US 70 CORRIDOR BUSINESSES

Table A-10 provides a summary of the estimated economic activity within the US 70 study corridor by number of establishments, employment and sales volume.

Table A-10: Businesses located within the US 70 Corridor (2014) ($2016)

Industry	Businesses	Employment	Annual Sales ($ millions)
Agriculture and Natural Resources	7	21	$7.1
Construction	17	565	$202.4
Manufacturing	17	2,985	$907.2
Wholesale Trade	16	105	$210.0
Retail Trade	101	1,296	$448.6
Transportation and Warehousing	7	21	$7.1
Finance and Other Professional Services (a)	41	207	$53.7
Educational and Health Care Services	11	201	$4.1
Food, Lodging and Entertainment.	57	964	$58.9
Other Services	55	278	$15.9
Public Administration	10	103	-
Total	**343**	**6,993**	**$1,946.0**

Note: (a) Sector also includes Insurance and Real Estate Services
Source: ECU BBR 2015.

Manufacturing is the largest employer with nearly 3,000 jobs. This is followed by retail, and accommodation and food services which combined employ 2,260 workers. Correspondingly, manufacturing has the highest annual sales value at nearly $868 million. This is followed by retail trade with over $429 million in annual sales.

BUSINESS SURVEY

Thirty-three businesses and property owners responded to the written surveys, with the respondents including retail businesses, medical offices, daycares, churches, and non-profits. Most of the businesses are small businesses, with a majority employing fewer than 10 employees. Four businesses among the 33 employed over 50 employees, with the largest among them employing over 300 employees. These businesses depend on sales to a diverse group of customers – ranging from drive-by/impulse shoppers, to local Kinston residents and customers residing outside of Lenoir County. Most of the customers and employees use US 70, primarily during the morning and evening rush hours. The businesses' freight movement is also dependent on US 70. This freight movement takes place primarily during business hours, although there was more diversity in peak travel time for truck deliveries between businesses. There was a split among the respondents identifying general economic conditions (that influence customer demand) and roadway access as the most important economic drivers for their businesses.

It was noted on the surveys and in the small group meetings that most businesses that serve drive-by/impulse and need based shoppers also serve customers that reside outside of Lenoir County. Roadway access is the most important determinant for their business. This implies that changes in traffic patterns – diversion of traffic away from the existing highway - would negatively affect these businesses that are dependent on out-of-county customers. On the other hand, A large number of businesses are destination businesses with a loyal customer base and/or serve local Kinston residents. These businesses are less likely to be negatively affected by the

traffic diversion from the project and more likely to benefit from improved traffic conditions. The benefits would result from the reduced commute times for employees and the decreased transportation costs for truck deliveries.

Five major employers responded to the major employers' survey. Each of these businesses has annual sales exceeding $5 million and together they employ approximately 1,800 people. The five respondents include a healthcare center, a distribution center, a utility company, a manufacturer, and a textile firm. The healthcare center primarily serves Kinston residents, and US 70 is not frequently used by either its customers or employees. On the other hand, the textile company has a more regional customer base. Its customers, mostly residing outside of Lenoir County, use US 70 for truck deliveries, making it a destination business. The distribution center, manufacturer, and electric utility company are businesses that do not depend on customers travelling to their businesses, and consequently their sales are not dependent on highway access. However, they do depend on US 70 for their business operations, such as truck deliveries and employee commuting. Improved highway conditions would be beneficial for all five major employers and they are not negatively affected by the anticipated traffic diversion, as is found with some of the smaller businesses located along the existing highway.

APPENDIX B – SMALL GROUP MEETINGS WITH KINSTON BUSINESSES

PURPOSE

The purpose of the small group meeting with local businesses was to enhance our understanding of the business climate along the US 70 corridor and to determine their dependence on US 70. We aimed to get insights on the way that the US 70 contributes to the success of the business, what the effects of traffic congestion are, and what respondents think would potential impacts of the proposed alternatives.

METHODS

We held five group meetings with each group consisting of approximately five business owners during November 2017. Each meeting lasted for 30 minutes. We structured the meeting along the five categories with the following questions:

1. Impact of the U.S. 70 on personal business
    a. How does US-70 contribute to your business's success?
    b. Do you rely on US 70 for the majority of your business customers, deliveries, or shipping?
    c. What percentage of your customer base is local?
    d. How important is visibility from US-70 for attracting new customers?
2. Impact of the U.S. 70's current traffic conditions

    How does the US 70's current traffic conditions affect businesses along the corridor and elsewhere in Kinston?
3. Impact of the Upgrade Existing U.S. 70 Alternative

    If the Upgrade Existing US 70 Alternative is selected, how would your business be impacted? Consider potential changes in traffic patterns, visibility, removal of parking/property frontage, changes in or limiting access, and potential for future growth, etc.
4. Impact of the all alternatives

    Of all the Project Alternatives, which do you prefer for: (1) your business; (2) Kinston's general economy? Consider loss off traffic on US 70, potential relocation (residential and business), closure of nearby businesses, new development or competing business along the bypass route, redevelopment along existing US 70, etc.
5. Long term impacts

    Over the long term, what changes to your business operations and/or future development plans (target customers, marketing strategies, operations, location) would you expect if a specific alternative were selected?

RESULTS

From the meetings the team gained valuable insights on the business climate along the US 70 corridor and learned about the variety of opinions represented among the five groups. We summarized overarching responses in Table B-1.

Table B-1: Detailed response summary of small group meetings

Group A	Group B	Group C	Group D	Group E	Summary Findings
Q.1: How does US-70 contribute to your business's success? (Do you rely on US 70 for the majority of your business customers, deliveries, or shipping? What percentage of your customer base is local? How important is visibility from US-70 for attracting new customers?)					
▪ Neuse Sport Shop 90% out of town customers ▪ Majority: out of town business (70%) ▪ Alternatives would see great losses in out of town stops during the summers.	▪ The success of many businesses depend significantly on the U.S. 70.	▪ The success of fruit stands depends 95 % on the U.S. 70 ▪ Lenoir Community College depends 50% on the U.S. 70 ▪ Golds Gym depends 50% on the U.S. 70	▪ Increases access to surrounding counties ▪ Makes Kinston as a business location more appealing. ▪ 50% out of town customers from La Grange ▪ BoJangles 30% out of town customers ▪ Gas stations capture a lot of beach traffic.	▪ The success of many businesses depend significantly on the U.S. 70. ▪ Truckers are the largest clientele. ▪ Delivery services depend on U.S. 70.	▪ The success of many businesses depend significantly on the U.S. 70. ▪ Visibility and access is a determining factor for the success of most businesses. ▪ Beach traffic contributes significantly to the sales of businesses along the U.S. 70.

Group A	Group B	Group C	Group D	Group E	Summary Findings
How does the US 70's current traffic conditions affect businesses along the corridor and elsewhere in Kinston?					
▪ The success of many businesses depend significantly on the U.S. 70. ▪ Current conditions are good and more traffic is better for their businesses.	▪ Current traffic is the lifeblood of all business align the U.S. 70 ▪ U.S. 70 is mostly not congested with the exception of summer weekends.	▪ Current traffic has a positive effect on businesses and the U.S. 70 provides good visibility. ▪ U.S. 70 is mostly not congested with the exception of summer weekends.	▪ The high speed traffic coming off Goldsboro Bypass will be dangerous. ▪ Kinston accounts for 30% of fuel after Goldsboro Bypass. ▪ Respondents see no congestion on U.S. 70, but rather heading east to Walmart Area.	▪ Respondent argues that U.S. 70 needs to be repaved. ▪ U.S. 70 is mostly not congested with the exception of summer weekends. ▪ U.S. 70 needs more turn lanes.	▪ Current conditions along the U.S. 70 with easy access to all businesses contribute to their success. ▪ U.S. 70 is mostly not congested with the exception of summer weekends.
If the No-Build ("do nothing") Alternative is selected, what effects on your business and to the Kinston's overall economy would expect? (Consider potential changes in traffic patterns, visibility, parking/property frontage, changes in or limiting access, and potential for future growth, etc.)					
▪ No impact.	▪ U.S. 70 has a positive impact no diverting traffic will make current business grow more.	▪ Prefers even more traffic in Kinston as existing businesses are already suffering under lack of traffic. ▪ U.S. 70 has a positive impact no diverting traffic will make current business grow more.	▪ Southern coast will develop more than Kinston. ▪ "We are in the way not in the way." ▪ Access stays the same.	▪ No changes would be positive for existing businesses, but would increase congestion for locals and increase accidents and mortality rates.	▪ U.S. 70 has a positive impact no diverting traffic will make current business grow more. ▪ Some respondents note, however, that Kinston will lose out to the more southern route to the beach.

Group A	Group B	Group C	Group D	Group E	Summary Findings
If the Upgrade Existing US 70 Alternative is selected, how would your business be impacted? Consider potential changes in traffic patterns, visibility, removal of parking/property frontage, changes in or limiting access, and potential for future growth, etc.					
▪ Reduced sales ▪ Reduces parking in front of the businesses. ▪ Diminishes access to businesses.	▪ Wrong access points can have severely negative effects on businesses. ▪ Upgrade is the most expensive option and will disturb businesses.	▪ Fruit Stand would be eliminated. ▪ Gym would remain unchanged. ▪ College would lose one building. But students would still come to study and the Building exceeded its' lifespan already.	▪ Depending on design, the access under the upgrade could improve. ▪ Argues that an access in paramount is necessary.	▪ The construction period would cause current businesses and result in loss of land.	▪ Most important are future access points and access to business from alternatives. ▪ The construction period would cause current businesses and result in loss of land.
Of all the Project Alternatives, which do you prefer for: (1) your business; (2) Kinston's general economy? Consider loss off traffic on US 70, potential relocation (residential and business), closure of nearby businesses, new development or competing business along the bypass route, redevelopment along existing US 70, etc.					
Business ▪ Shallow Bypass Kinston Shallow Bypass	Business ▪ Shallow Bypass Kinston ▪ Shallow Bypass	Business ▪ No Build Kinston ▪ No Build	Business ▪ Shallow Bypass Kinston ▪ Shallow Bypass	Business ▪ Shallow Bypass Kinston ▪ Shallow Bypass	Business ▪ Shallow Bypass Kinston ▪ Shallow Bypass
Over the long term, what changes to your business operations and/or future development plans (target customers, marketing strategies, operations, location) would you expect if a specific alternative were selected?					
-	▪ Depends on access points, design, signage, online marketing and visibility.	▪ Would prefer the Shallow alternative over the southern alternative.	▪ Argues for 'buy out money' for businesses to relocate. ▪ Changes will depend on the access points of the new bypass.	▪ Depends on access points, design, signage, online marketing and visibility. ▪ The alternatives would increase the labor pool.	▪ Depends on access points, design, signage, online marketing and visibility. ▪ Subsidies for businesses that need to relocate.

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