



4. Environmental Consequences

This section summarizes the impacts of the alternatives carried forward for further study. Impacts, both positive and negative, are discussed with respect to the affected environment, as described in **Chapter 3**. Quantitative impacts are shown in tables and figures where applicable.

The No-Build Alternative means no actions would be implemented under this project (STIP Project U-2826B). The No-Build Alternative would not incur right-of-way or construction costs. There would be no short-term disruptions along the existing roadways during construction. There would be no impacts to streams, wetlands, or other natural and cultural resources, nor would there be any residential or business relocations. However, the No-Build Alternative would not meet any of the purposes identified for this project, nor would it solve or alleviate any of the needs, as described in **Chapter 1**. Impacts for the build alternatives (Alternatives 9, 10, and 12) are described in the remainder of this chapter.

4.1 Impacts to Land Use and Zoning

As discussed in the **Section 3.2**, the proposed US 52 improvements are consistent with local land use plans, zoning ordinances, and transportation plans.

While the improvement scenarios represent substantive changes to the local transportation infrastructure, it is unlikely that there will be major or direct impacts to existing land use patterns. While direct impacts to land use (except limited number of relocations or building removals) would not result from the proposed scenarios, secondary impacts would occur. When considering the scenarios that include changes to highway access, it is evident that traffic patterns would be altered as a result of the changes.

The development throughout the corridor is well established and is not likely to undergo substantial changes in land values (positive or negative) given the proposed scenarios. Even the most notable changes are offset by proposed enhancements and the presence of existing reasonable transportation alternatives. The lack of direct impacts is attributed to the type of land uses developed along the interchanges where the greatest impacts typically occur (full or partial interchange closure). At these locations very few highway oriented land uses are developed. Rather, the stable neighborhoods with ample transportation choices that exist in some of these locations are likely to benefit from the reduction in through trips associated with the existing freeway access.

The resulting decreased frequency of interchange access along the corridor combined with an interconnected surface street network creates an environment where



transportation access to and from the corridor is ample and sufficient to accommodate reasonable access throughout the corridor.

Careful evaluation of the alternatives for US 52 reveals many positive impacts to corridor safety and operations. Most of these transportation benefits are related to the limited addition of capacity, reduction of conflicting movements, and use of technology. For those features of the alternatives that do not include changes to highway interchange access, there is no impact to existing land use.

The greatest community impacts would result from those remaining alternatives that modify existing highway access and surface street network; specifically alternatives that include the following:

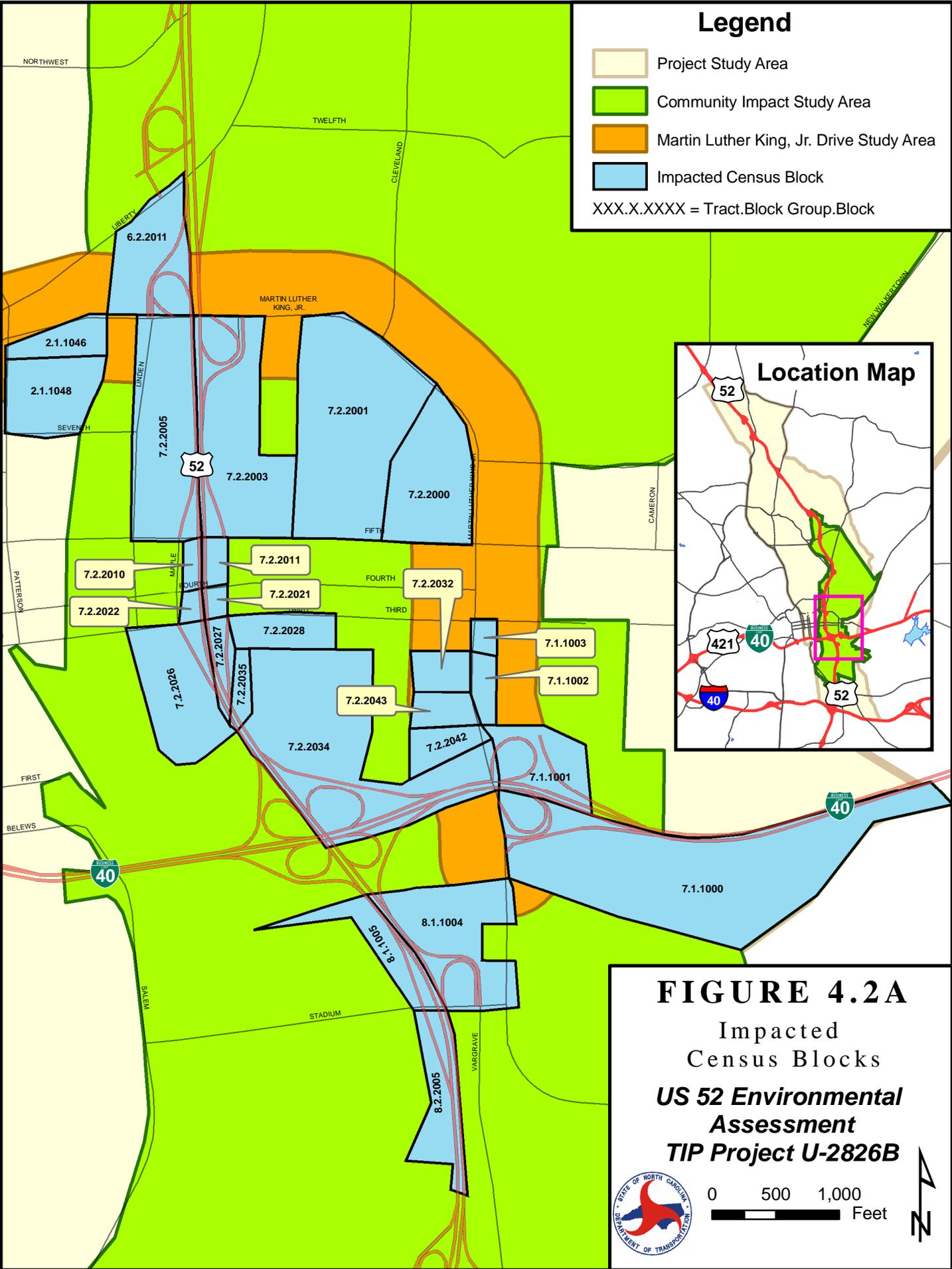
- Closure of Stadium Drive Interchange (Alternatives 9, 10, and 12)
- Closure of ramps at 3rd and 5th Streets (Alternatives 9 and 10)
- Modifications of Akron Drive Interchange (Alternatives 9, 10, and 12)

The improvements on Martin Luther King, Jr. Drive would mitigate for closing the 3rd and 5th Street ramps.

4.2 Socioeconomic Impacts

Socioeconomic impacts were calculated using approximated construction limits for each alternative. Impact areas include areas that are currently unpaved which would be graded or paved as part of this project. Areas that are currently paved and would be converted into grassed areas are given negative values. The net impact is the difference between the two areas. The impacted areas are shown in **Figure 4-1(A-E)**. **Table 4-1** summarizes impacts as well as Census data for race, ethnicity, and age for impacted blocks. Impact areas refer to all construction impacts, including construction impact within existing US 52 right of way, and do not necessarily indicate right-of-way acquisition.

Impacted Census blocks and groups are shown on **Figure 4.2 (A-B)**.



Legend

- Project Study Area
 - Community Impact Study Area
 - Martin Luther King, Jr. Drive Study Area
 - Impacted Census Block
- XXX.X.XXXX = Tract.Block Group.Block

Location Map

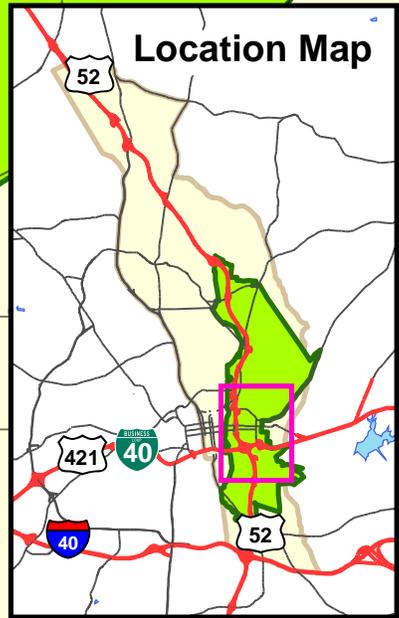


FIGURE 4.2A

Impacted
Census Blocks

**US 52 Environmental
Assessment
TIP Project U-2826B**



0 500 1,000
Feet



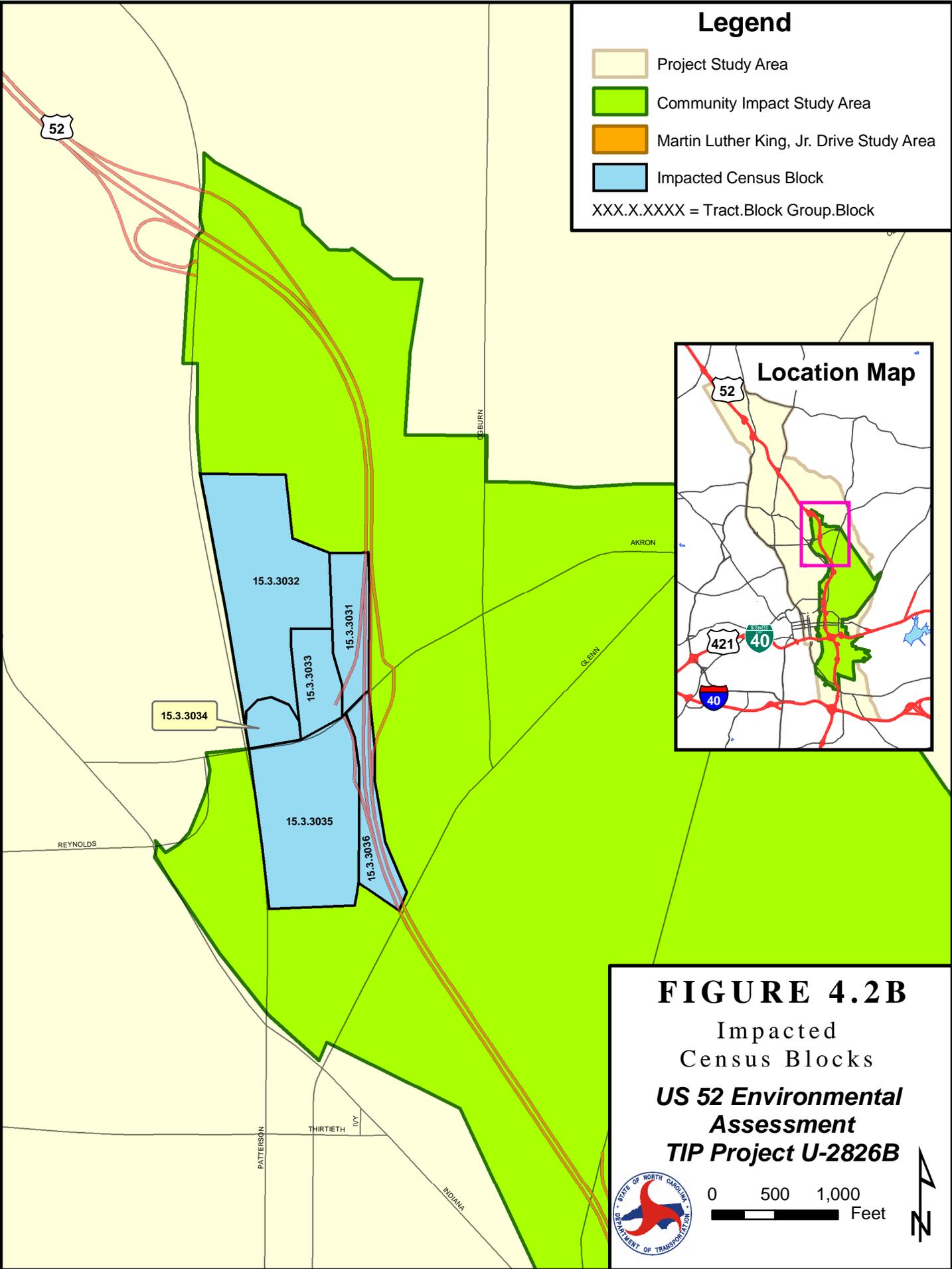




Table 4-1. 2000 Socioeconomic Data for Impacted Census Blocks

Census Tract, Block Group, and Block	Population	Net Impact Area by Alternative*			Percent Hispanic	Percent Minority	Percent over 65
		9	10	12			
15.3.3032	54	-0.01	-0.01	-0.01	0%	41%	7%
15.3.3031	31	-0.18	-0.18	-0.18	19%	97%	3%
15.3.3033	16	0.04	0.04	0.04	31%	94%	0%
15.3.3036	1	-0.09	-0.09	-0.09	0%	100%	0%
8.1.1004	25	0.75	0.75	0	0%	100%	2%
7.2.2043	22	-0.15	-0.15	0	18%	73%	5%
7.2.2042	16	-0.07	-0.07	0	0%	100%	13%
7.2.2034	341	-0.04	-0.04	0	2%	98%	6%
7.2.2032	29	-0.11	-0.11	0	0%	100%	10%
7.2.2028	148	0.00	0.00	0	7%	99%	3%
7.1.1001	16	-0.41	-0.41	0	19%	100%	3%
7.1.1002	15	-0.24	-0.24	0	0%	100%	13%
7.1.1003	1	-0.13	-0.13	0	0%	100%	100%
Total Populated	715	-0.63	-0.63	-0.24			
Non Populated	0	-3.23	-1.82	1.45			
Total	715	-3.86	-2.45	1.21			

Source: US Census Bureau, 2000

Negative values refer to areas that are currently paved which would be converted to grassed areas.

* "Net impact" refers to all construction impacts, including construction within existing US 52 right of way, and does not necessarily indicate right-of-way acquisition.

Table 4-2. Potential Socioeconomic Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10		✓		
12		✓		

Thirteen populated Census Blocks would be impacted by Alternatives 9 and 10, and seven populated Census Blocks would be impacted by Alternative 12. The largest impacts by Alternatives 9 and 10 are in Blocks 1001, 1002, and 3031. The largest impacts by Alternative 12 are in Block 3031. In Block 1004, more pavement would be converted to grassed area than the reverse, which results in an overall benefit for that block, in terms of physical impact.

Two of the Census Blocks with the greatest impacts, Blocks 1001 and 3031, have 19 percent Hispanic. Block 1002 has no Hispanic population. Block 2034, the most populated Block impacted by the project, has two percent Hispanic. The affected Block with the largest percent Hispanic (31 percent) would be benefited by all three alternatives since there would more pavement converted to grassed area than the reverse in that Block.



All of the three Census Blocks with the greatest impacts are at least 97 percent minority. Block 1004, which would be benefited by this project, is 100 percent minority.

Block 1003, which would be impacted by Alternatives 9 and 10, has one resident, who is over 65 years old. One of the Census Blocks (Block 1002) with the greatest impacts has 13 percent residents over 65 years old. The other two Census Blocks with the greatest impacts have 3 percent residents over 65 years old.

4.2.1 Environmental Justice Impacts

US 52 was designed and implemented in the late 1960's as a result of transportation studies that identified a need to improve access to industrial land uses, to downtown, and to local neighborhoods while connecting directly to the I-40 corridor immediately south of downtown. While the project certainly addressed the goal and improved north/south mobility, it also split many of the established minority neighborhoods that had recently been undergoing revitalization. Currently, the US 52 corridor is the primary north/south route for both local and through traffic in the Winston-Salem area. However, it (US 52) still exists as a major barrier for the neighborhoods that abut the freeway and as such, facility cross connectivity continues to be an issue of focus to the community.

To garner important viewpoints and issues of citizens in the study area, community leaders were interviewed and ordinary citizens engaged through other correspondence (e-mail, letters, and a project hotline). Three Citizen Informational Workshops and several small group meetings were available to minority and low income citizens, as well as to all concerned citizens. Based on the feedback received, a number of common issues were identified, with the most important being the need for the community to be involved in the decision-making process. As improvements to the corridor are made, the community has a clear goal of being involved in the process and included in decisions that are made for the corridor. **Section 6** describes the public involvement process in more detail.

The objective of the US 52 improvements is to improve safety and mobility. As noted in **Table 3-4 and 3-5** and **Figure 3.4 and 3-5**, the community impact study area/Martin Luther King, Jr. Drive study area has significantly higher percentages of minority, Hispanic, and low-income households in comparison with Forsyth County.

The potential closing of the Stadium Drive, 3rd Street, and 5th Street ramps with US 52 would change travel patterns, but not eliminate access to minority, Hispanic, and low-income communities. These improvements would alleviate traffic congestion and improve traffic safety for a major freeway that serves regional traffic and Winston-Salem, including minority, Hispanic, and low-income communities. The change in access to these environmental justice communities is an unavoidable effect resulting from the implementation of the project. A secondary and positive impact will be an increase in traffic on Martin Luther King, Jr. Drive which will improve visibility of the local



businesses. Based on the analysis above, impacts are not expected to be disproportionate based on race or ethnicity, given the demographics of the study area.

4.2.2 Economic Impacts

4.2.2.1 Income Levels

Poverty status is determined by the Census Bureau based on income versus a poverty threshold, which varies according to family size and ages of members. The same thresholds are used throughout the United States, and are updated annually for inflation (*U.S. Census Bureau*). **Table 4-3** summarizes impacts as well as Census data for poverty status for impacted block groups (the lowest level available from the Census data). Impact areas refer to all construction impacts, including construction impact within existing US 52 right of way, and do not necessarily indicate right-of-way acquisition.

Table 4-3. 2000 Economic Data for Impacted Census Block Groups

Census Tract and Block Group	Population	Net Impact Area by Alternative, acres - Total impact (Impact to parcels)*			Percent Below Poverty (Households)**
		9	10	12	
15.3	1,082	-0.29	-0.29	-0.29	26%
801.2	1,100	-0.09	-0.09	-0.09	57%
801.1	33	0.88	0.88	0.88	21%
7.2	1,042	-3.08	-1.67	-0.20	43%
7.1	785	-0.97	-0.97	0	20%
6.2	667	-0.19	-0.19	0	25%
2.1	1,290	-0.13	-0.13	0	52%
Total	5,999	-3.86	-2.45	0.29	

Source: US Census Bureau, 2000

Negative values refer to areas that are currently paved which would be converted to grassed areas.

* "Net impact" refers to all construction impacts, including construction within existing US 52 right of way, and does not necessarily indicate right-of-way acquisition.

** Poverty level is based on 1999 data in the 2000 Census

The majority of the impacted area is within Census Block Group 7.2, which has 43 percent of households below poverty. The Block Groups with the largest percent of households below poverty (Block Groups 2.1 and 801.2) have the smallest negative impacts in all three alternatives. There is a positive impact within Block Group 801.1, which has 21 percent of households below poverty.

4.2.2.2 Tax Base Changes

Alternatives 9 and 10 would require the displacement of a RJ Reynolds Trucking Facility warehouse building. However, the building and other associated buildings are located within the *Piedmont Triad Research Park (PTRP) Master Plan* and will ultimately be displaced due to the completion of the research park. Otherwise, the proposed improvements would have little impact on adjacent property values. It is not anticipated that the proposed improvements and ramp closures would cause businesses to move to



the study area, relocate to other locations within the study area, or move outside of the study area.

Table 4-4. Potential Economic Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12		✓		

4.2.3 Employment Impacts

A report by the US Department of Transportation Federal Highway Administration estimates that “per \$1 billion of investment in 1996, the Federal-aid highway program supports approximately 42,100 fulltime job-equivalents” and these jobs include 7,900 direct or on-site construction jobs, 19,700 indirect or supply industry jobs, and 14,500 induced jobs or jobs supported by the general economy (*Summary: Economic Impacts of Federal-Aid Highway Investment*, December 1999). Based on these findings, the implementation of the US 52 recommendations may generate approximately 633 jobs consisting of 119 direct highway on-site construction jobs, 296 indirect or supply-related jobs, and 218 induced jobs supported within the general economy.

While Alternatives 9 and 10 would displace a RJ Reynolds Trucking Facility warehouse building that currently employs 42 people, it is likely that the business activity that occurs at this site would be relocated to another existing RJ Reynolds facility in the area. The proposed improvements are consistent with the *Piedmont Triad Research Park (PTRP)*, which is anticipated to be a major employer.

The improvement in regional mobility is expected to result in a positive impact on regional and downtown growth, and thus provide a slight positive indirect impact to the tax base and employment.

Table 4-5. Potential Employment Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12	✓			

4.3 Community Impacts

4.3.1 Community Facility Impacts

There are no direct impacts on community facilities and services from the ramp changes, shoulder use, or Intelligent Transportation Systems under study. However, Emergency Medical Services (EMS) has expressed concern over the proposed closing of the 3rd Street and 5th Street ramps, as noted in **Section 4.3.2**.



4.3.2 Access Impacts

Great concern and care are always taken when proposed improvements have the potential to adversely impact a business, institution, or residence, either directly or indirectly. The proposed improvement alternatives for the US 52 corridor are being planned to provide a safer, better functioning facility for the local community as well as regional traffic. Therefore, it is important that the community be well informed about the alternatives and have ample opportunity to provide feedback to decision makers. Several public workshops and community outreach activities have been conducted to inform and solicit feedback from the community. While there appears to be local support for the improvements, not all of the feedback has been positive. Each interchange has a constituency, as described below:

Stadium Drive ramps (affected by Alternatives 9, 10, and 12) — While Winston-Salem State University is supportive of the ramp closures as a means of efficiently expanding the geographic limits of its campus, Salem Academy and College is opposed to this measure and is concerned about circulation and access impacts for students, faculty, staff, and visitors to each of their campuses. Without internal streets connecting the east and west campus areas, Salem Academy and College relies on access both from Main Street as well as from US 52. Salem Academy and College considers routing traffic to Main Street an adverse impact.

Salem Academy and College also believe that conditions would worsen if Business 40 were closed for reconstruction, as planned by NCDOT after 2010. An alternative solution would be the construction of the Salem Creek connector roadway (STIP Project U-2925); however, Salem Academy and College wishes to have that planned new roadway turn north toward downtown rather than terminate at Salem Avenue.

3rd and 5th Street ramps (affected by Alternatives 9 and 10) — A large church with a regional congregation as well as several black-owned businesses rely in part on highway access. Ramp closures would impact the ease of accessibility to the church and businesses by non-local traffic. Ramp closures would also affect accessibility for EMS vehicles, including fire trucks and ambulances. The nearest EMS facility is located in the northeast quadrant of the interchange of US 52 and 5th Street, with direct access to northbound US 52 from Metropolitan Drive and access to southbound US 52 from Maple Street. Closing 3rd and 5th Street ramps would result in an estimated increased travel time of approximately one minute for EMS vehicles from that facility.

Reduction in access would be mitigated by the proposed improvements to the Martin Luther King, Jr. Drive corridor. Conversion to two-way traffic flow along 4th and 5th Streets is one of the improvements proposed to enhance accessibility within the Downtown and East Winston communities and in this neighborhood. Traffic signal preemption for EMS vehicles will be considered after the project is in place if additional mitigation is required.



Martin Luther King, Jr. Drive/Business 40/US 421 ramps (affected by Alternatives 9 and 10) – The Zion Memorial Baptist Church is located at the intersection of 1st Street and Dunleith Avenue. The modifications proposed under Alternatives 9 and 10 is to the off-ramp from westbound Business 40/US 421 to Martin Luther King, Jr. Drive would affect the access for this church. 1st Street would be closed at that intersection to allow for the off-ramp to tie directly into Martin Luther King, Jr. Drive. Traffic accessing the church from Martin Luther King, Jr. Drive or US 52 would have to take a more indirect route along 3rd Street. A concrete median is also proposed along 1st Street from the end of the Business 40/US 421 westbound on-ramp to the intersection of Martin Luther King, Jr. Drive with 1st Street, which would prevent vehicles from turning left from Wheeler Street onto the on-ramp.

Martin Luther King, Jr. Drive/US 52 ramps (affected by Alternatives 9 and 10) – The ramps at the interchange of US 52 with Martin Luther King, Jr. Drive would be modified to improve access. A new southbound on-ramp would be added as part of the Martin Luther King, Jr. Drive improvements. The southbound off-ramp would be modified to add a traffic signal, add a westbound right turn lane, and restriped to include a left turn, through, and right turn lane. The northbound off-ramp would be restriped to include a shared left-right turn lane, and a new traffic signal would be installed.

Martin Luther King, Jr. Drive between 1st and 3rd Streets (affected by Alternatives 9 and 10) – To maintain the visual integrity of the East Winston Historic District, it has been proposed to add a concrete median along Martin Luther King, Jr. Drive from 1st Street to 3rd Street, with breaks at existing driveways. This will not affect the access for any current residents or businesses.

Akron Drive (affected by Alternatives 9, 10, and 12) — To improve safety and reduce driver confusion, it has been proposed to separate ramps physically from local streets (Leo Street). However, a long-time business owner running the tow truck operation along US 52 responsible for responding to reported crashes indicated there have been very few crashes at the southbound off-ramp intersection with Leo Street. This business owner also expressed concern that the separation of the ramps from Leo Street would increase his response time. Another concern associated with the proposed improvements at Akron Drive is access to the other businesses and the Northside Shopping Center. Currently, access is convenient from Leo Street and the US 52 ramps and this would be altered with the proposed improvement at this location.

These concerns all involve potential impacts that would create a redistribution of traffic and changes in access.



Table 4-6. Potential Access Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12		✓		

4.3.3 Relocation Impacts

A relocation report was completed by NCDOT on April 23, 2007 (see **Appendix D**). Based on this report, one residence and one business would be relocated by Alternatives 9 and 10. Alternative 12 would not require any relocations.

The residence that would be relocated by Alternatives 9 and 10 is located on Martin Luther King, Drive, and is a tenant-occupied minority residence.

The only business that will be impacted by Alternatives 9 and 10 is the RJ Reynolds Trucking Facility warehouse located in the southwest quadrant of the US 52/ Martin Luther King, Jr. Drive interchange. This business relocation would be required to accommodate the proposed US 52 southbound entrance ramp. It is estimated that it will cost \$1,530,000 to relocate the RJ Reynolds warehouse. This relocation will take place as part of the *Piedmont Triad Research Park (PTRP) Master Plan*, and is expected to occur prior to this project's construction. RJ Reynolds has made arrangements to relocate this facility, and it is not expected that this relocation would necessitate job loss because the business activity would likely be relocated rather than be closed.

It is the policy of NCDOT to ensure that comparable replacement housing is available for relocatees prior to construction of state and/or federally assisted projects. Furthermore, NCDOT has three programs to minimize the inconvenience of relocation: relocation assistance, relocation moving payments, and relocation replacement housing payments or rent supplements.

With the Relocation Assistance Program, experienced NCDOT staff would be available to assist displacees with information such as: availability and prices of homes, apartments, or businesses for sale or rent, and financing or other housing programs. The Relocation Moving Payment Program, in general, provides for payment of actual moving expenses encountered in relocation. Where displacement would force an owner or tenant to purchase or rent property at higher cost or to lose a favorable financing arrangement (in case of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program would compensate up to \$22,500 to owners who are eligible and qualify, and up to \$5,250 to tenants who are eligible and qualify.

The relocation program for the proposed action would be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646) and the North Carolina Relocation Assistance Act (GS-133-5 through 133-18). This program is designed to provide assistance to displaced persons in



relocating to a replacement site in which to live or do business. At least one relocation officer is assigned to each highway project for this purpose. The relocation officer would determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations without regard to race, color, religion, sex, or national origin. NCDOT would schedule its work to allow ample time, prior to displacement, for negotiation and possession of replacement housing that meets decent, safe, and sanitary standards. The relocatees are given a 90-day written notice after NCDOT purchases the property.

Relocation of displaced persons would be offered in areas not generally less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement housing would be within the financial budget of the families and individuals displaced and would be reasonably accessible to their places of employment. The relocation officer also would assist owners of displaced businesses, non-profit organizations, and farm operations in searching for and moving to replacement property. All tenant and owner residential occupants who may be displaced would receive an explanation regarding all available options, including: 1) purchases of replacement housing; 2) rental of replacement housing, either private or public; and 3) moving existing owner-occupied housing to another site (if practicable). The relocation officer also would supply information concerning other state or federal programs offering assistance to displaced persons and would provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

Last Resort Housing is a program used when comparable replacement housing is not available, or is unavailable within the displacee's financial means, and the replacement payment exceeds the federal and state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. Since opportunities for replacement housing appear adequate within the study area, it is not likely that the Last Resort Housing Program would be necessary for the proposed project. However, this program would still be considered, as mandated by State law.

Table 4-7. Potential Relocation Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12	✓			

4.3.4 Impacts to Community Cohesion

Most of the proposed US 52 improvements would occur within the existing right of way and would not physically intrude into the surrounding neighborhoods. The roadway would not be physically widened with the exception of the proposed ramp improvements at Martin Luther King, Jr. Drive/US 52 and Akron Drive. Bridge access across US 52 along Stadium Drive, 3rd, and 5th Streets between downtown Winston-Salem and East Winston will be maintained even though some of the US 52 ramp access will be closed



depending upon which alternative is selected. The proposed ramp closures would result in traffic pattern changes to local facilities such as Salem Academy and College, Winston-Salem State University, numerous churches, multiple parks and greenways, and several schools as well as to the local businesses and residences. It is important to note that access would be changed, but not eliminated. Ramp closures would improve safety and may improve level of service, which may benefit local businesses as well as other local development. Although some residents and businesses are concerned that closing ramps would further isolate some communities from the city, future traffic volumes are anticipated to increase along US 52 and Martin Luther King, Jr. Drive due to the proposed modifications.

Table 4-8. Potential Community Cohesion Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12		✓		

4.4 Infrastructure and Utility Impacts

There are no anticipated impacts to power, natural gas, or other utilities by any of the alternatives.

Table 4-9. Potential Infrastructure and Utility Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9	✓			
10	✓			
12	✓			

4.5 Cultural Resources Impacts

4.5.1 Archaeological Resources

None of the alternatives would affect any sites eligible or listed on the National Register of Historic Places, and an archaeological investigation is not warranted.

4.5.2 Historic Architectural Resources

Three properties within the APE are listed in the National Register. Two properties and one district are determined eligible for listing on the National Register. Based on concurrence forms dated April 3, 2007 and July 27, 2007 (**Appendix E**), all of the alternatives would have No Effect on the three properties listed on the National Register and the two properties determined eligible for listing on the National Register. Alternatives 9 and 10 (with improvements to Martin Luther King, Jr. Drive) would have No Adverse Effect on the district that is determined eligible for the National Register. These resources include:



- Vargrave Street Bridge over Salem Creek (Eligible) – No Effect (Alternatives 9, 10, and 12) under Project U-2826B (surveyed as part of Project U-2925)
- Fairview Moravian Church (Eligible) – No Effect (Alternatives 9, 10, and 12) because construction will take place at a considerable distance from the property
- Union Station (Listed) – No Effect (Alternatives 9, 10, and 12) because construction will be limited to the opposite side of the road
- Lloyd Presbyterian Church (Listed) – No Effect (Alternatives 9, 10, and 12) because construction will take place at a considerable distance from the property
- Mars Hill Baptist Church (Listed) – No Effect (Alternatives 9, 10, and 12) because no changes will occur to or on the church’s property and access to church parking will not be significantly effected by the median in Martin Luther King, Jr. Drive for Alternatives 9 and 10
- East Winston Historic District (Eligible) – No Effect (Alternative 12) because construction will take place at a considerable distance from the property. No Adverse Effect (Alternatives 9 and 10) because construction will take place in the backyards of properties within the district; right of way will be taken from these backyards, but the reduction in backyard area will not have an adverse effect on the district’s integrity; concrete sidewalks will be replaced and fences will be replaced with owners’ consent/cooperation; closing Wheeler, Dunleith, and a section of First Street will not adversely effect the district’s integrity; and SHPO and NCDOT will insure that the uneconomic remnant at 143 Martin Luther King, Jr. Drive is disposed of in a way that does not adversely affect the East Winston Historic District

Table 4-10. Potential Cultural Resource Impacts

Alternative	No Effect	No Adverse Effect	Adverse Effect
9	✓	✓*	
10	✓	✓*	
12	✓		

* No Adverse Effect to the East Winston Historic District

4.6 Impacts to Section 4(f) and 6(f) Properties

There are no Section 4(f) impacts to the Vargrave Street Bridge over Salem Creek (Eligible), Fairview Moravian Church (Eligible), Union Station (Listed), Lloyd Presbyterian Church (Listed), or Mars Hill Baptist Church (Listed) by any of the alternatives.

There are “minimal” impacts to the East Winston Historic District property by Alternatives 9 and 10. There are no Section 4(f) impacts to the East Winston Historic District property by Alternative 12. Based on the July 27, 2007 concurrence regarding Section 106 issues, as noted above, FHWA has issued a *DeMinimus* impact finding on the Section 4(f) property (see **Appendix E**). This is based on the No Adverse Effect determination on the East Winston Historic District.



None of the alternatives will directly impact any of the 6(f) properties located in the study area.

4.7 Impacts to the Visual Environment

No substantial visual impacts are anticipated from the ramp changes, shoulder use, or intelligent transportation systems under study. US 52 and Martin Luther King, Jr. Drive will still present the same basic appearance from the surrounding neighborhoods. Ramp closures would present an opportunity for adding landscaping to screen the highway.

Table 4-11. Potential Visual Environment Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9		✓		
10		✓		
12		✓		

4.8 Air Quality Impacts

4.8.1 Air Quality Microscale Analysis

An microscale air quality analysis was performed for Alternative 9 (the alternative with the greatest amount of improvements) in June 2007. Based on this analysis, Alternative 9 is not predicted to cause exceedances of the National Ambient Air Quality Standard for carbon monoxide in 2005, 2010, or 2025 and thus neither would Alternatives 10 or 12. The microscale air quality analysis is documented in *Air Quality Analysis Report, US 52 Corridor, Project U-2826B Technical Memorandum* (June 2007), appended by reference. A summary of the methodology, results, and conclusions is provided below.

Analysis of Alternative 9 used recent (2000-2002) background concentrations and persistence factors available from the NC Division of Air Quality at their website (www.daq.state.nc.us/permits/mets/alerts.shtml). The background concentration for the Winston-Salem/Forsyth County region is 2.7 (ppm) and the persistence factor is 0.80.

Methodology. The worst case intersections for each scenario (i.e., Existing, Build, Background, etc), in terms of highest overall traffic volume was selected for the detailed air quality analysis. The impacts associated with the roadway improvements were analyzed within a 500-foot radius at the worst case intersection. This worst case determination was referenced against the intersection performing at the worst level of service during each scenario.

Based on the traffic capacity analysis, the worst case operating signalized intersection along the study area corridor was evaluated for the following years and conditions: 2005 Existing, 2005 Build, 2010 Build, 2025 Existing, and 2025 Build. AM and PM Peak conditions was evaluated for each scenario in order to find the worst performing



intersection overall for each scenario. Based on the traffic and capacity analysis for the project, the following signalized intersections for each scenario were selected for the air quality analysis.

- 2005 Existing: Martin Luther King, Jr. Drive at First Street (PM peak hour) 31
- 2005 Build: Martin Luther King, Jr. Drive at 5th Street (PM peak hour) 28
- 2010 Build: Martin Luther King, Jr. Drive at 5th Street (PM peak hour)
- 2025 Background: Martin Luther King, Jr. Drive at 3rd Street (PM peak hour) 28
- 2025 Build: Martin Luther King, Jr. Drive at 5th Street (PM peak hour)

To conduct the air quality assessment, the line source computer model CAL3QHC was used to predict the local CO concentration components. The CAL3QHC model is a dispersion computer model developed for the EPA. Based on the assumption that vehicles at an intersection are either in motion or an idling state, the program is designed to predict air pollution levels by combining emissions from both moving and idling vehicles. The background component is assumed to be 2.7 ppm as directed by the Human Environment Unit – Air Quality Section, NCDOT.

CAL3QHC uses emission factors generated by EPA's approved model Mobile 6. To evaluate the maximum impact of the proposed project on ambient CO concentrations, worst case inputs were used in the modeling including receptor locations at minimum right-of-way distances, adverse meteorology, peak traffic conditions, and worst case CO vehicle emission factors. The worst case assumptions for these parameters are not expected to occur simultaneously; however, the objective is to develop a worst case scenario to predict the highest CO concentrations that could reasonably occur as a result of the project.

A total of 31 receptors were selected at the First Street intersection, 28 receptors were selected at the 3rd Street intersection, and 28 receptors were selected at the 5th Street intersection. Most of the receptors were located near the right-of-way line in each quadrant of the intersection. Some receptors were located at building entryways.

Analysis Results.

Mobile Source Air Toxics (MSATs): As discussed in **Section 3.9**, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, when a highway is improved (not necessarily widened) as is the case with the US 52 improvements, resulting in traffic moving closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative. This could be offset due to increases in speeds and reductions in congestion associated with lower MSAT emissions.



Carbon Monoxide (CO) Emissions: The modeling results shown in **Table 4-12** indicate the maximum predicted one-hour CO concentration (receptor 1) at the existing intersection for the year 2005 Existing Scenario is predicted to be 6.80 parts per million (ppm) at a wind angle of 333 degrees. Applying a 0.80 persistence factor, the eight-hour CO concentration is 5.44 ppm.

The maximum predicted one-hour CO concentration (receptor 18) at the proposed intersection for the year 2005 Build Scenario is predicted to be 5.90 parts per million (ppm) at a wind angle of 210 degrees. Applying a 0.80 persistence factor, the eight-hour CO concentration is 4.72 ppm.

The maximum predicted one-hour CO concentration (receptor 18) at the proposed intersection for the year 2010 Build Scenario is predicted to be 5.20 parts per million (ppm) at a wind angle of 280 degrees. Applying a 0.80 persistence factor, the eight-hour CO concentration is 4.16 ppm.

The maximum predicted one-hour CO concentration (receptor 6) at the proposed intersection for the year 2025 Background Scenario is predicted to be 4.30 parts per million (ppm) at a wind angle of 346 degrees. Applying a 0.80 persistence factor, the eight-hour CO concentration is 3.44 ppm.

The maximum predicted one-hour CO concentration (receptor 24) at the proposed intersection for the year 2025 Build Scenario is predicted to be 4.80 parts per million (ppm) at a wind angle of 166 degrees. Applying a 0.80 persistence factor, the eight-hour CO concentration is 3.84 ppm.

Comparing these results to the one-hour standard of 35 ppm and eight-hour standard of 9 ppm indicates that the maximum predicted CO concentration for the existing and design years of 2005, 2010, and 2025 will be less than the standard for each case. Therefore, the CO emissions attributable the proposed US 52 and Martin Luther King, Jr. Drive improvements will not cause a violation of the state or national ambient air quality standards (NAAQS) for CO.

Table 4-12. Comparison of Model Results to Ambient Air Quality Standards for CO for Alternative 9

Average Period	NAAQS (ppm)	Model Results (ppm)				
		2005 Existing	2005 Build	2010 Build	2025 Background	2025 Build
1-hour (peak)	35	6.80	5.90	5.20	4.30	4.80
8-hour	9	5.44	4.72	4.16	3.44	3.84

ppm: parts per million



Table 4-13. Potential Air Quality Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9		✓		
10		✓		
12		✓		

4.8.2 State Implementation Plan (SIP) Consistency

Both the Clean Air Act and TEA-21 (Transportation Equity Act for the 21st Century) require conformity between a proposed transportation system and the State Implementation Plan (SIP). The transportation conformity regulations are intended to ensure that a state does not undertake federally funded or approved transportation projects, programs, or plans that are inconsistent with the state’s obligation to meet and maintain the NAAQS. Metropolitan Planning Organizations (MPOs) must show that expected emissions from their transportation system are within the mobile source emission budgets in the applicable SIP. Transportation projects must come from conforming transportation plans/programs, and transportation plans/programs must conform to the SIPs.

The project is located in Forsyth County, which is within the Greensboro-Winston-Salem-High Point maintenance area for one hour ozone (O₃) and the Winston-Salem nonattainment area for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated these areas as moderate non-attainment area for O₃ and CO. However, due to improved monitoring data, these areas were redesignated as maintenance for O₃ on November 8, 1993 and for CO on November 7, 1994. Section 176(c) of the CAAA requires that transportation plans, programs, and projects conform to the intent of the state air quality implementation plan (SIP). The current SIP does not contain any transportation control measures for Forsyth County. The *Winston-Salem Urban Area 2030 Long Range Transportation Plan (LRTP)*, the *High Point MPO 2030 LRTP* and the *2007-2013 Metropolitan Transportation Improvement Programs (MTIPs)* conform to the intent of the SIP. The USDOT made a conformity determination on the *Winston-Salem/Forsyth County MPO LRTP* on October 1, 2005, the *High Point MPO LRTP* on October 1, 2004, the *Winston Salem/Forsyth MPO TIP* on June 29, 2007, and the *High Point MPO TIP* on June 29, 2007. The current conformity determination is consistent with the final conformity rule found in 40 CFR Parts 51 and 93. There are no significant changes in the project’s design concept or scope, as used in the conformity analyses.

Forsyth County was designated as a moderate nonattainment for O₃ under the eight-hour ozone standard on April 15, 2004. Effective on November 22, 2004, EPA reclassified Forsyth County from a moderate nonattainment area to a marginal nonattainment area. Forsyth County is under an Early Action Compact and the effective date of the nonattainment designation has been deferred until April 15, 2008. 40 CFR Parts 51 and 93 is not applicable until April 15, 2009 (one year after the nonattainment designation becomes effective).



4.9 Noise Impacts

This project is classified as a Type I category project – a federal-aid highway project that involves reconstruction or physically altering an existing highway, which requires a mandatory noise analysis study be conducted. The noise analysis results show that 91 receivers would exceed the noise abatement criteria (NAC) in the 2025 No-Build condition and 105 receivers would exceed the NAC in the 2025 Future Build condition (the *US 52 Noise Analysis Technical Memorandum*, September 2007, is appended by reference).

Along the US 52 corridor, all receivers exceed the NAC in the 2025 No-Build and 2025 Future Build Conditions. Despite the exceedance, on average the noise levels would decrease between the existing condition and the 2025 Future Build condition. Potential noise barrier walls were considered at the proposed 3rd Street off-ramp closure and just south of the existing US 52 northbound Martin Luther King, Jr. Drive off-ramp. It is not expected that a noise barrier wall would be reasonable at either location due to the substantial elevation difference between the existing US 52 roadway and the sensitive noise receivers. The potential noise barrier walls would need to be constructed higher than NCDOT’s standard 25-foot maximum wall height in order to provide adequate attenuation. Therefore, noise barrier walls are not expected to be reasonable along the US 52 corridor.

Along the Martin Luther King, Jr. Drive corridor, 67 receivers exceed the NAC in the 2025 No-Build condition, and 80 receivers exceed the NAC in the 2025 Future Build condition. However, the majority of these receivers are expected to be only slightly higher than the 66 dBA Leq noise level threshold. Construction of noise barrier walls are not practicable along the Martin Luther King, Jr. Drive corridor because of vehicular sight distance requirements and site access constraints. Noise barrier walls are generally ineffective on roadways where driveway access is to be maintained. A final noise study will be performed by NCDOT during final design.

Table 4-14. Potential Noise Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12		✓		

4.10 Impacts on Hazardous Materials

There are no anticipated impacts to hazardous material sites from any of the alternatives.



Table 4-15. Potential Hazardous Material Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9	✓			
10	✓			
12	✓			

4.11 Geology, Soils, and Mineral Resources Impacts

The construction of the proposed road improvements and interchanges would require the removal of soils and the placement of fill. No adverse long-term impacts to soils and topography are expected from the proposed project.

Table 4-16. Potential Geology, Soils, and Mineral Resource Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9	✓			
10	✓			
12	✓			

4.12 Water Resources Impacts

No impacts to streams, wetlands, floodplains, or floodways are anticipated to occur under any of the alternatives.

Table 4-17. Potential Water Resource Impacts

Alternative	No Impact	Low Impact	Medium Impact	High Impact
9	✓			
10	✓			
12	✓			

4.13 Biotic Community Impacts

There are no biotic community impacts for any of the alternatives since all impacts occur in maintained-disturbed areas. Maintained-disturbed areas do not correspond to any Schafale and Weakley (1990) community classification because the native vegetation has been removed or altered. Therefore, maintained-disturbed area impacts are not considered impacts to biotic communities. Maintained-disturbed areas include the maintained road shoulders, utility corridors, and clearcut areas. Total impacts are summarized in **Table 4-18**. Some pavement will be converted to grassed area, which will be classified as maintained-disturbed. “Net impacted area” is calculated by subtracting the new grassed area from the new pavement area.



Table 4-18. Total Impacted Area

Alternative	Net Impacted Area (acres)	Biotic Community
9	3.86	Maintained-disturbed
10	2.45	Maintained-disturbed
12	-0.29	Maintained-disturbed

4.13.1 Rare and Protected Species

There are no federally listed endangered or threatened species that are likely to be affected by the project.

Critical habitat, as defined by the United States Fish and Wildlife Service (USFWS), is not designated for any species listed in Forsyth County. In addition, according to North Carolina's Natural Heritage Program (NCNHP) database, no federally listed threatened, endangered, or species of concern listed by the USFWS have been documented within a one-mile radius of the proposed project corridor.

Within Forsyth County, there are two federally listed endangered species (the red-cockaded woodpecker and small-anthered bittercress) and one federally listed threatened species (bog turtle, threatened by similarity of appearance) listed by the USFWS. No suitable habitat was found for any of these species within the study area, and field reconnaissance did not reveal any species within the study area.

4.13.2 Federally Protected Species

According to the September 17, 2007 USFWS Internet listing, two federally listed endangered species, the red-cockaded woodpecker (*Picoides borealis*) and small-anthered bittercress (*Cardamine micranthera*), and one federally listed threatened species, the bog turtle (*Clemmys muhlenbergii*), are listed for Forsyth County. The bog turtle is listed due to similarity of appearance to the northern populations of the species. Species listed as threatened due to similarity are not biologically endangered or threatened and are not subject to Section 7 consultation. Therefore, no surveys or Biological Conclusions are required for this species.

Biological Conclusions of “No Effect” were found for the red-cockaded woodpecker and the small-anthered bittercress.

4.13.3 Federal Species of Concern

Federal species of concern are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered. Federally listed species of concern are defined as species under consideration for listing when there is insufficient information to support listing as Threatened or Endangered. This species list is provided for information



purposes as the status of these species may be upgraded in the future. Therefore, consideration should be given to potential occurrences within the study area.

There is only one federally listed species of concern (FSC), the brook floater (*Alasmidonta varicosa*) in Forsyth County. Current state and federal laws do not require protection of FSC. One FSC was designated within the study area in case the status is upgraded in the future.

Table 4-19. Potential Protected Species Impacts

Alternate	No Impact	Low Impact	Medium Impact	High Impact
9	✓			
10	✓			
12	✓			

4.14 Construction Impacts

4.14.1 Water Quality and Drainage

The primary sources of water-quality degradation in urban areas are nonpoint source discharges and stormwater runoff. Potential impacts associated with construction of the proposed project include the following: increased sedimentation resulting from the clearing of streams and in-stream construction activities; soil compaction; loss of shading due to vegetation removal; and fertilizers and pesticides used in re-vegetation. Measures to minimize these potential impacts include formulation of an erosion and sedimentation control plan, provisions for waste material and storage, stormwater management measures, and appropriate road-maintenance measures.

Aquatic communities are sensitive to even small changes in their environment. The placement of box culverts in a channel, other stream channelization, scouring, siltation, sedimentation, and erosion from construction-related work can affect water quality and biological constituents. Impacts usually associated with in-stream construction include alterations to the substrate and impacts to adjacent streamside vegetation. Such disturbances within the substrate can lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish and amphibian species. Siltation may also cover benthic macro invertebrates with excessive amounts of sediment and inhibit their ability to obtain oxygen.

4.14.2 Air Quality

Temporary negative air quality impacts would occur as a result of fugitive dust/fine particulate matter during construction operations. However, any associated temporary emissions from construction equipment would be less than the conformity *de minimis* levels established for carbon monoxide and ozone. The contractor would be responsible for controlling dust at the project site and at areas affected by the construction. Dust control measures may include the following activities:



- Minimizing exposed earth surface
- Temporary and permanent seeding and mulching
- Watering working and haul areas during dry periods
- Covering, shielding, or stabilizing material stockpiles
- Using covered haul trucks

Emissions from construction equipment are regulated by federal standards. No burning would be performed at the project site or within the project boundaries.

4.14.3 Noise

Although the equipment noise levels are expected to be the main contributor to the construction activity noise emissions, noise impacts during the project construction consistently maintain a short duration. Peak noise levels from highway construction equipment, as measured at a distance of 50 feet, may vary from 70 dBA and 100 dBA. General construction noise impacts that can be expected are temporary speech interference for passerby and those individuals working near the project. Such noise would be limited to daylight hours as much as possible.

4.14.4 Construction Waste

All construction waste materials generated during clearing, grubbing, and other construction phases would be removed from the project site and burned or disposed of by the contractor in accordance with state and local regulations. Litter and other general trash will be collected and disposed of at local landfill locations.

4.14.5 Utility Service

The proposed project may require some adjustment, relocation, or modification to existing utilities during construction. Any disruption to utility service during construction would be minimized by phased adjustments to the utility line. All modifications, adjustments, or relocations would be coordinated with the affected utility company.

4.14.6 Detours and Accessibility

Maintenance of traffic and sequencing of construction will be planned and scheduled so as to minimize traffic delays within the project corridor. Plans for the maintenance and protection of traffic in conjunction with construction activities associated with this project will be prepared in accordance with the latest edition of the *Manual of Uniform Traffic Control Devices* and roadway standards of NCDOT. Signs would be used as appropriate to provide notice of road closures and other pertinent information to the



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traveling public. Advance notice through the local media will be made to alert the public of traffic restrictions and construction related activities.

Table 4-20. Potential Construction Impacts*

Alternate	No Impact	Low Impact	Medium Impact	High Impact
9			✓	
10			✓	
12			✓	

* All construction impacts are temporary

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