



## 5. Selection of the Preferred Alternative

Alternative 9 has been selected as the Preferred Alternative for STIP Project U-2826B. Following the third citizens workshop, a preferred alternative has been selected by NCDOT based on input from regional leaders, stakeholders, interested citizens, the consultant's recommendation, and the recommendation of a 15-member Study Advisory Committee. The Study Advisory Committee was comprised of representatives from FHWA, NCDOT, and local planning staff. Their recommendation was based on consensus that Alternative 9 best met the Purpose and Need, as described in **Section 5.2**. Below are a description of the Preferred Alternative and a summary of impacts.

### 5.1 Description of the Preferred Alternative

Alternative 9, the Preferred Alternative, is shown on **Figure 2.2**, and includes the following elements in addition to the "committed" improvements included in the STIP and LRTP:

- Close US 52 ramps and loop at Stadium Drive (NCDOT may choose to complete this improvement following the construction of the Salem Creek Connector between Vargrave Street and Martin Luther King, Jr. Drive, which is part of STIP Project U-2925)
- Convert shoulders (north and south bound) to travel lanes full time from Business 40/US 421 at US 52 interchange to the Martin Luther King, Jr. Drive at US 52 interchange
- Close US 52 ramps at 3rd and 5th Streets
- Build Akron Drive interchange modifications
  - Southbound on-ramp – remove two-way traffic from Leo Street, allowing one-way movement into Northside Shopping Center
  - Southbound off-ramp – delete two-way movements and remove Leo Street tie-in (north side of Leo Street)
  - Leo Street – wrap Leo Street around and tie into Sheridan Street
- ITS Improvements
  - Provide enhanced 511 service (ITS)
  - Expand use of dynamic message signs and closed-circuit cameras (ITS)
  - Implement adaptive signal control and detection on parallel arterials (ITS)
  - Install truck rollover warnings (ITS)

The following improvements are included as approved mitigation and enhancements for the Preferred Alternative as of this document:



- Mitigation for closing 3rd and 5th Street ramps. Mitigation of the loss of access to downtown Winston-Salem and the Research Park is included in the form of operational and intersection improvements along the Martin Luther King, Jr. Drive corridor and reversion of 5th and 4th Streets from one-way to two-way traffic. Traffic signals are removed on 4th Street due to reduce traffic volumes.
  - Martin Luther King Jr. Drive at Business 40/US 421 Interchange – revise loops to tie at intersections of First and Lowery Streets, remove slip ramp/access to Lowery from loop, and change access to Lowery Street from the on-ramp to right in / right out only
  - Martin Luther King, Jr. Drive at Excelsior Street/Lowery Street – lengthen southbound left turn lane to approximately 530 feet
  - Martin Luther King Jr. Drive at C.E. Gray Drive– change eastbound to right in / right out only
  - Martin Luther King, Jr. Drive at First Street – add new southbound left turn lane, rebuild westbound off-ramp from Business 40/US 421 at Martin Luther King, Jr. Drive interchange to tie directly to First Street (resulting in the closure of First Street from Martin Luther King, Jr. Drive to Dunleith Avenue), deadend/cul-de-sac of Wheeler Street prior to First Street, and tying/wrapping the eastern section of First Street into Dunleith Avenue
  - Martin Luther King Jr. Drive at Lawrence Street – change eastbound to right in / right out only
  - Martin Luther King Jr. Drive at Second Street – change eastbound and westbound to right in / right out only
  - Martin Luther King, Jr. Drive at 3rd Street – on 3rd Street add new eastbound shared through-left lane, change eastbound through-right lane to right turn lane, on Martin Luther King, Jr. Drive lengthen northbound left turn lane to approximately 300 feet and lengthen southbound left turn lane, provide approximately 100 feet of storage
  - Reversion of 5th and 4th Streets from one-way to two-way traffic
  - Martin Luther King, Jr. Drive at 4th Street – change eastbound (west side) through-right lane to right in / right out only and change eastbound (east side) to a right in / right out only, remove traffic signal
  - Martin Luther King, Jr. Drive at 5th Street – add new northbound left turn lane, provide approximately 325 feet of storage, lengthen southbound left turn lane, provide approximately 150 feet of storage
  - Martin Luther King, Jr. Drive at New Walkertown Road – lengthen southbound left turn lane, provide approximately 440 feet of storage
  - Martin Luther King, Jr. Drive at US 52 northbound off-ramp – restripe ramp approach to include a shared left-right turn lane, install traffic signal



## ENVIRONMENTAL ASSESSMENT

### US 52 OPERATIONAL IMPROVEMENTS

- Martin Luther King, Jr. Drive at US 52 southbound off-ramp – add westbound right turn lane, restripe ramp approach to include a left turn, through and right turn lanes, install traffic signal
- Martin Luther King, Jr. Drive at US 52 interchange – add new southbound on-ramp
- Martin Luther King, Jr. Drive at Patterson Avenue – add northbound right turn lane on Patterson Avenue and restripe northbound Patterson Avenue to include a left turn, through and right turn lanes
- 4th Street – remove traffic signals at 4th Street/Maple Street and 4th Street/Metropolitan Drive
- Mitigation and enhancement for converting shoulders on northbound and southbound US 52 to travel lanes. Since shoulder areas will be converted to travel lanes, mitigation is required to provide a safe alternative for drivers who need to stop suddenly in these areas.
  - Replace existing curbs with rollover type curbs.
- Mitigation and enhancement for Akron Drive interchange modifications. Mitigation is required to guide drivers to the shopping center via an indirect route
  - Enhance signage from Akron Drive to “shopping center” using route via Sheraton Street and Patterson Avenue.
- Emergency services mitigation. Mitigation may be required for emergency medical service vehicles due to the loss of access as a result of closing 3rd and 5th Street ramps. If EMS response time is negatively affected by the proposed changes, this mitigation will be considered.
  - Traffic signal pre-emption for emergency medical service (EMS) vehicles will be considered after the project is in place to mitigate for any potential problems for EMS access.
- Landscaping enhancement.
  - NCDOT will work with the City to develop a landscaping plan for the areas impacted by this project.
- Signage modifications.
  - NCDOT will work with the City and regional staff to modify signage for the Preferred Alternative after the project is in place. They will determine which signage needs to be modified on a case-by-case basis during the development of the final plans. NCDOT will clarify the signage for US 52 ramps at the 25th Street/Akron Drive interchange for drivers traveling to the airport.

The following improvements are under consideration as mitigation and enhancements for the Preferred Alternative as of this document:

- Enhancement for closing US 52 ramps and loop at Stadium Drive



- Enhance streetscape on Stadium Drive
- Enhance access to Salem Creek Greenway
- Mitigation and enhancement for converting shoulders on northbound and southbound US 52 to travel lanes. Additional mitigation may be required following the conversion of shoulders to travel lanes to provide adequate safety measures for drivers.
  - Modify ramp merge and diverge areas to provide comparable or more area to merge and diverge
  - Widen to provide and replace auxiliary lanes between successive on- and off-ramps.
  - Increase number and service time of the Incident Management Assistance Patrol (IMAP) trucks.
  - Invest in one or more trucks with plows to “push” disabled vehicles out of the travelway.
  - Build retaining walls as needed to create areas for disabled vehicles to move off the highway.
- Enhancement for Akron Drive interchange modifications.
  - Enhance access, safety, and security on existing pedestrian bridge over US 52 near Happy Hills.

The following improvement was previously proposed as mitigation, and is now included as part of the ITS portion of the Preferred Alternative:

- Enhance ITS measures to detect vehicle breakdowns more quickly where converting shoulders on northbound and southbound US 52 to travel lanes.

## 5.2 Meeting the Purpose and Need

The Preferred Alternative meets all three points of the Purpose and Need.

- **Reduce the number of crashes on US 52 from I-40 to 4th Street and at Akron Drive.**

The Preferred Alternative is anticipated to reduce crashes by removing the Stadium Drive ramps and loop, removing the 3rd/5th Street ramps, and converting the shoulders to travel lanes between Business 40/US 421 and Martin Luther King, Jr. Drive.

From 2003 to 2006, there were a total of 62 crashes at the interchange of Stadium Drive and US 52, 66 percent of which were rear-end crashes. It is estimated that these crashes resulted in 7 additional, secondary crashes either upstream or downstream of the primary crashes. It is anticipated that removing the ramps and loop at this interchange will reduce the number of crashes at this location as well



as at adjacent interchanges.

From 2003 to 2006, there were a total of 86 crashes at the interchange of 3rd/5th Streets and US 52, 79 percent of which were rear-end crashes. It is estimated that these crashes resulted in 12 additional, secondary crashes either upstream or downstream of the primary crashes. It is anticipated that removing the ramps at this interchange will reduce the number of crashes at this location as well as at adjacent interchanges.

The current weaving distance between Business 40/US 421 and 3rd/5th Streets is 750 feet, and the weaving distance between 3rd/5th Streets and Martin Luther King, Jr. Drive is 1,525 feet. Converting the northbound and southbound shoulders to travel lanes from Business 40/US 421 to Martin Luther King, Jr. Drive will provide a dedicated weave lane in each direction, which is anticipated to improve safety along that corridor.

Currently, there are five interchanges in the 1.4-mile section from Diggs Boulevard to Martin Luther King, Jr. Drive, with a total of 34 conflict points. By removing the ramps at 3rd/5th Streets, removing the ramps and loop at Stadium Drive, and adding a new southbound on-ramp at Martin Luther King, Jr. Drive, this section of US 52 will be reduced to 19 conflict points (see **Figure 5-1**). It is anticipated that reducing conflict points will improve safety along this corridor.

With a recommended interchange spacing of one mile by FHWA, the recommended weaving distance between two traditional diamond interchanges is approximately 2,500 feet. The current weaving distance between Stadium Drive and Business 40/US 421 is 450 feet northbound and 650 feet southbound. The current weaving distance between Business 40/US 421 and 3rd/5th Streets is 600 feet northbound and 750 feet southbound. Removing the ramps and loop at the interchanges of US 52 with 3rd/5th Streets and Stadium Drive removes the weaves between those two interchanges and the Business 40/US 421 interchange. It also reduces the opportunity for secondary crashes resulting from crashes at those two interchanges. Therefore, the number of crashes at Business 40/US 421 may also decrease.

ITS devices such as DMS units and CCTV cameras will reduce the response time of emergency vehicles following a crash, and will alert travelers of incidents and alternate routes. This is anticipated to reduce queuing and unexpected stopping, which may reduce the number of secondary crashes along the corridor.

- **Improve mobility for traffic traveling on US 52 through the Winston-Salem area.**

The Preferred Alternative is anticipated to improve mobility by improving geometry along the US 52 corridor, including the use of existing shoulders as travel lanes, interchange enhancements, elimination of interchange ramps, and ITS measures.



Converting the northbound and southbound shoulders to travel lanes from Business 40/US 421 to Martin Luther King, Jr. Drive will provide an additional weave lane in each direction. Removing the Stadium Drive ramps and removing the 3rd/5th Street ramps will remove weave issues and will reduce conflict points along the corridor. These modifications will improve mobility on US 52 from I-40 to Martin Luther King, Jr. Drive.

The two-way movements on the ramps at Akron Drive will be modified to be one-way movements only. This is anticipated to reduce driver confusion and improve mobility at that interchange by streamlining the traffic from US 52 to the mall and other destinations.

- **Comply with goals and objectives in existing land use and transportation plans for US 52 in the Winston-Salem area.**

This project is consistent with the *2005 Winston-Salem Urban Area Thoroughfare Plan*, the *US 52 Corridor Land Use and Transportation Plan*, the *Winston-Salem/Forsyth County Urban Area 2030 Multi-Modal Long Range Transportation Plan*, the *NCDOT Draft 2008-2015 State Transportation Improvement Program (STIP)*, and the *Legacy Development Guide*.

US 52 is designated as a freeway/expressway throughout the project area on the *2005 Winston-Salem Urban Area Thoroughfare Plan*.

In the *US 52 Corridor Land Use and Transportation Plan*, Project U-2826B is acknowledged as an interim project consistent with the long-term goal of widening US 52 to a continuous 6-lane freeway along the project corridor.

Project U-2826B is included in the *Winston-Salem/Forsyth County Urban Area 2030 Multi-Modal Long Range Transportation Plan* for the 2005-2014 time period.

The *NCDOT Draft 2008-2015 STIP* includes Project U-2826B, with right-of-way scheduled to begin in FY 2009 and construction scheduled to begin in FY 2010.

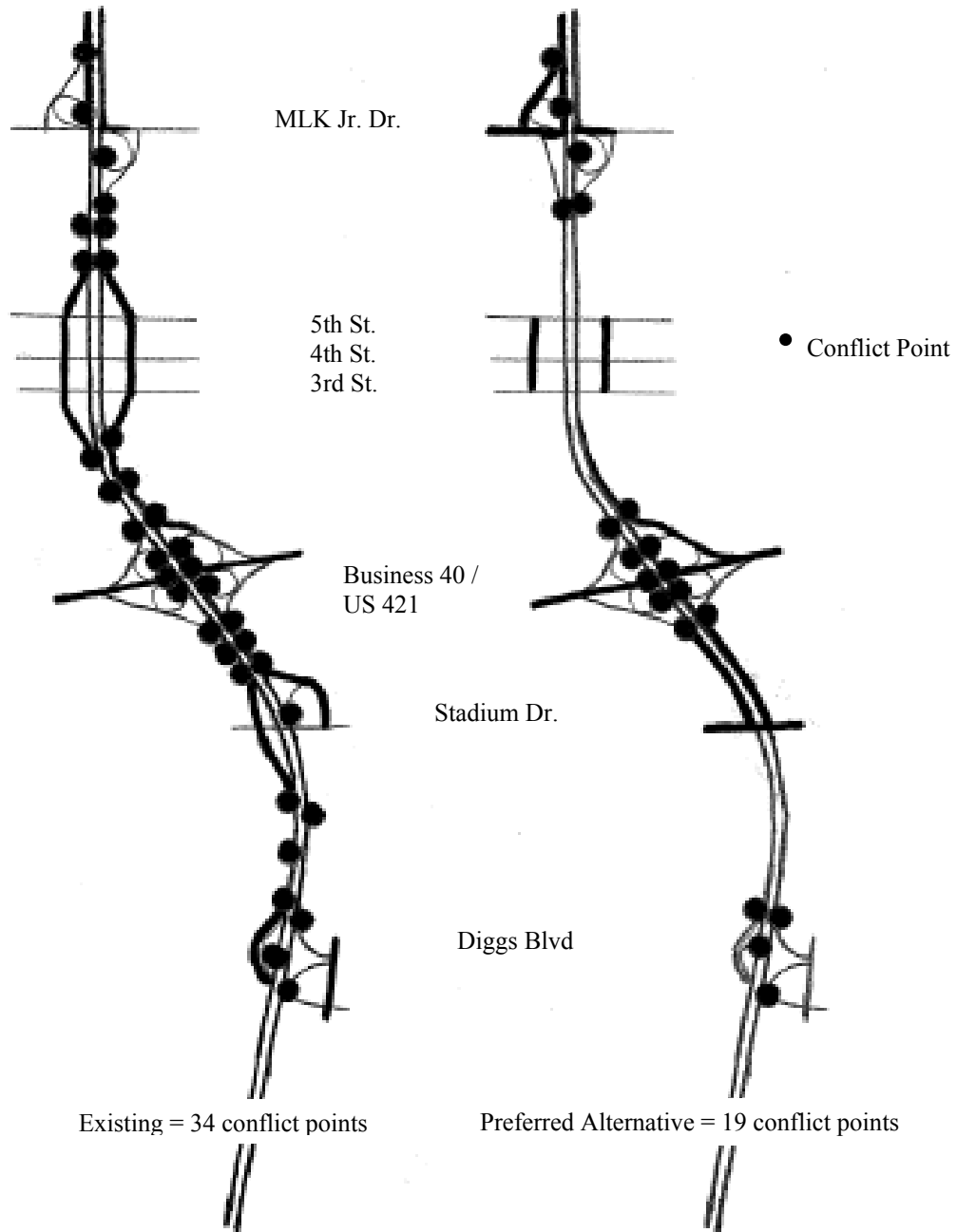
Although the *Legacy Development Guide* does not specifically mention the US 52 widening project, it suggests that improvements to the US 52 corridor near downtown Winston-Salem could encourage traffic to remain on the freeway and leave downtown streets to serve local needs. Therefore, the proposed improvements in this project would support the visionary goals stated in the *Guide*.

- **A secondary purpose for this project is to reduce the barrier effect between the communities located on the east and west sides of the US 52 corridor.**

It is anticipated that the Preferred Alternative will enhance connectivity within the community by improving Martin Luther King, Jr. Drive, which crosses the US 52 corridor.



**Figure 5.1. Conflict Points**





### 5.3 Impacts of the Preferred Alternative

Impacts for the Preferred Alternative (Alternative 9) are summarized in **Table 5-1**. More detail on impacts is in **Section 4**. Impacts are given as “no impact,” “low impact,” “medium impact,” or “high impact.”

**Table 5-1. Summary of Impacts for Preferred Alternative**

Topic	Potential Impact	Conclusion
Land Use and Zoning	No Impact	Non-significant
Socioeconomics	Medium Impact	Non-significant
Economics	Medium Impact	Non-significant
Employment	Medium Impact	Non-significant
Access	Medium Impact	Non-significant
Relocation	Medium Impact	Non-significant
Community Cohesion	Medium Impact	Non-significant
Infrastructure and Utilities	No Impact	Non-significant
Cultural Resources	No Adverse Effect*	Non-significant
Visual Environment	Low Impact	Non-significant
Air Quality	Low Impact	Non-significant
Noise	Medium Impact	Non-significant
Hazardous Materials	No Impact	Non-significant
Geology, Soils, and Mineral Resources	No Impact	Non-significant
Water Resources	No Impact	Non-significant
Biotic Communities	No Impact**	Non-significant
Protected Species	No Impact	Non-significant
Construction Impacts	Medium Impact	Non-significant

\* No Adverse Effect to the East Winston Historic District

\*\* Impact to maintained-disturbed area only, which is not considered a biotic community

#### 5.3.1 Impacts to Land Use and Zoning

The Preferred Alternative is consistent with local land use plans, zoning ordinances, and transportation plans.

While the Preferred Alternative will result in substantive changes to the local transportation infrastructure, it is anticipated that direct impacts to existing land use patterns will be minor. Development throughout the corridor is well established and is not likely to undergo substantial changes in land values (positive or negative). The Preferred Alternative will alter existing traffic patterns, by closing the Stadium Drive interchange, closing the ramps at 3rd and 5th Streets, modifying the Akron Drive interchange, and modifying the US 52/Martin Luther King, Jr. Drive interchange ramps.

The Preferred Alternative improvements are proposed to positively impact 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.





### 5.3.2 Socioeconomic Impacts

Thirteen populated Census Blocks would be impacted by the Preferred Alternative. The largest impacts by the Preferred Alternative are in Blocks 1001, 1002, and 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 the Preferred Alternative 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 the Preferred Alternative, 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.

### 5.3.3 Environmental Justice Impacts

The closing of the Stadium Drive, 3rd Street, and 5th Street ramps with US 52 will change travel patterns, but not eliminate access to minority, Hispanic, and low-income communities. These improvements will 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 for the Preferred Alternative are not expected to be disproportionate based on race or ethnicity, given the demographics of the study area.

### 5.3.4 Economic Impacts

**Income Levels.** The majority of the impacted areas for the Preferred Alternative are 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.



**Tax Base Changes.** The Preferred Alternatives will 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.

**Employment Impacts.** While the Preferred Alternatives 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.

### 5.3.5 Community Impacts

**Community Facility Impacts.** There are no direct impacts on community facilities and services from the Preferred Alternative. However, Emergency Medical Services (EMS) has expressed concern over the proposed closing of the 3rd Street and 5th Street ramps.

**Access Impacts.** The Preferred Alternative will change access at the Stadium Drive interchange, 3rd Street, 5th Street, Martin Luther King, Jr. Drive, and the Akron Drive interchange. The following summarize concerns about potential impacts resulting from these changes in access.

- **Stadium Drive ramps** — 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.
- **3rd and 5th Street ramps** — A large church and several 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. Improvements to Martin Luther King, Jr. Drive and conversion to two-way traffic flow along 4th and 5th Streets will minimize access impacts for these facilities. 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** – The modifications to the off-ramp from westbound Business 40/US 421 to Martin Luther King, Jr. Drive would affect the access for the Zion Memorial Baptist Church. 1st Street would be closed at the intersection of 1st Street and Dunleith Avenue, where the church is located, 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.
- **Martin Luther King, Jr. Drive/US 52 ramps** – The ramps at the interchange of US 52 with Martin Luther King, Jr. Drive would be modified to improve access.
- **Martin Luther King, Jr. Drive between 1st and 3rd Streets** – 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** — Access from Leo Street and the US 52 ramps would be altered with the proposed improvement at this location.

### 5.3.6 Relocation Impacts

The Preferred Alternative will require relocation of one residence and one business. The residence is located on Martin Luther King, Drive, and is a tenant-occupied minority residence. The business that will be relocated 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. This relocation is consistent with the *Piedmont Triad Research Park (PTRP) Master Plan*. It is not expected that this relocation would necessitate job loss because the business activity would likely be relocated rather than be closed.

All relocations will be done in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), the North Carolina Relocation Assistance Act (GS-133-5 through 133-18), and the NCDOT Relocation Assistance Program. The NCDOT Relocation Reports indicated that suitable replacement business sites and residences were available based upon discussions with area realtors, newspaper listings, and visual survey. Adequate housing will be available if the project is split into phases, although rental housing may present a problem for low income tenants. 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.



### 5.3.7 Impacts to Community Cohesion

Most of the Preferred Alternative improvements will 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. 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.

### 5.3.8 Infrastructure and Utility Impacts

The Preferred Alternative will not impact power, natural gas, or other utilities.

### 5.3.9 Cultural Resources Impacts

**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.

**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. The Preferred Alternative would have No Effect on the three properties listed on the National Register (Lloyd Presbyterian Church, Mars Hill Baptist Church, and Union Station) and the two properties determined eligible for listing on the National Register (Vargrave Street Bridge over Salem Creek and Fairview Moravian Church). It would have No Adverse Effect on the district that is determined eligible for the National Register (East Winston Historic District).

### 5.3.10 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 the Preferred Alternative.

There are “minimal” impacts to the East Winston Historic District property by the Preferred Alternative. 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.

The Preferred Alternative will not directly impact any of the Section 6(f) Properties located in the study area.

### 5.3.11 Impacts to the Visual Environment

The Preferred Alternative will not result in substantial visual impacts. 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.

### 5.3.12 Air Quality Impacts

The Preferred Alternative is not predicted to cause exceedances of the National Ambient Air Quality Standard for carbon monoxide in 2005, 2010, or 2025.

**Methodology.** The worst case operating signalized intersection along Martin Luther King, Jr. Drive was evaluated in the PM peak hour for the following conditions: 2005 Existing at 1st Street, 2005 Build at 5th Street, 2010 Build at 5th Street, 2025 Existing at 3rd Street, and 2025 Build at 5th Street.

To conduct the air quality assessment, the line source computer model CAL3QHC was used to predict the local CO concentration components. CAL3QHC uses emission factors generated by EPA's approved model Mobile 6.

**Analysis Results for Carbon Monoxide (CO) Emissions:** 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.

### 5.3.13 Noise Impacts

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.

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.

#### 5.3.14 Impacts on Hazardous Materials

The Preferred Alternative will not impact any potentially hazardous material sites.

#### 5.3.15 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 Preferred Alternative.

#### 5.3.16 Water Resources Impacts

No impacts to streams, wetlands, floodplains, or floodways are anticipated to occur under the Preferred Alternative.

#### 5.3.17 Biotic Community Impacts

The Preferred Alternative will have a net impact of 3.86 acres of maintained-disturbed area. 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, and there are no biotic community impacts for the Preferred Alternative.

**Rare and Protected Species.** There are no federally listed endangered or threatened species that are likely to be affected by the Preferred Alternative.

**Federally Protected Species.** 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.

**Federal Species of Concern.** 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.

### 5.3.18 Construction Impacts

The Preferred Alternative will have temporary construction impacts, as described below.

**Water Quality and Drainage.** The primary sources of water-quality degradation in urban areas are nonpoint source discharges and stormwater runoff. 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.

**Air Quality.** Temporary negative air quality impacts would occur as a result of fugitive dust/fine particulate matter during construction operations. Dust control measures may include minimizing exposed earth surface, seeding and mulching, watering working and haul areas, and covering stockpiles and 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.

**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. Such noise would be limited to daylight hours as much as possible.

**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.

**Utility Service.** The Preferred Alternative 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.

**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. Signs would be used as appropriate to provide notice of road closures and other pertinent information to the traveling public. Advance notice through the local media will be made to alert the public of traffic restrictions and construction related activities.



### 5.4 Cost Estimate

The estimated cost for the Preferred Alternative includes construction, right of way, and utilities costs on US 52, as well as ITS costs for the proposed ITS network. It also includes costs for the mitigation and enhancement activities on Martin Luther King, Jr. Drive. **Table 5-2** shows the breakdown of costs for each portion of the project.

**Table 5-2. Opinion of Planning Level Cost for Preferred Alternative (2007)**

Section	Probable Cost			
	Construction	Right of Way	Utilities Relocation	Total Cost
US 52	6,000,000	2,324,000	53,291	8,377,291
Martin Luther King, Jr. Drive	3,600,000	265,000	146,011	4,011,011
ITS	4,058,000	N/A	N/A	4,058,000
Total	13,658,000	2,589,000	199,302	16,446,302

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