1. Purpose and Need for Action

1.1 Introduction

1.1.1 Background

The section of US 52 currently under study for improvement is approximately 12 miles long and extends from I-40 Bypass on the south to the future Northern Beltway interchange on the north near NC 65 (Bethania-Rural Hall Road). This section of US 52 is a busy four-lane urban freeway with closely spaced interchanges, a high crash rate, and frequent traffic congestion. The improvements proposed as part of this project are included in the North Carolina Department of Transportation (NCDOT Draft 2008-2015 State Transportation Improvement Program (STIP)) as STIP Project U-2826B. The NCDOT Draft 2008-2015 STIP includes $18.29 million for construction and right-of-way costs for Project U-2826B. Construction improvements considered for this proposed project include the limited use of existing shoulders as additional travel lanes, Intelligent Transportation Systems (ITS), ramp closures and modifications, and traffic management improvements. Right-of-way acquisition is scheduled to begin in fiscal year (FY) 2009 and construction is scheduled to begin in FY 2010.

The project described in this study (Project U-2826B) is intended to be an interim solution to address issues related to safety and mobility on US 52. In 2003, the City of Winston-Salem completed a long-range (20-year) improvement plan for the US 52 corridor (US 52 Corridor Land Use and Transportation Plan, 2003), which evaluated facility improvements required to meet interstate design standards. The recommendations for this project have been developed in coordination with the long-range plan in an effort to eliminate the cost and effort that would result if interim improvements had to be modified or reconstructed to accommodate planned long-term improvements.

1.1.2 Project History

STIP Project U-2826 was initially developed to provide improvements for the safety and capacity of US 52 through Winston-Salem. Currently two of the original four components are listed in the Draft 2008-2015 STIP. U-2826A includes a bridge replacement over the Norfolk Southern Railroad, interchange improvements, and other roadway improvements and is currently scheduled for right of way in 2008 and construction in 2009. U-2826B includes the interim improvements in the corridor and also is scheduled for right of way and construction in 2009. U-2826C includes the long range improvements that would upgrade US 52 to an Interstate facility. The C portion is currently not scheduled in the Draft 2008-2015 STIP. STIP Project U-2925 includes the construction of the Salem Creek Connector and was U-2826D in previous STIPs, but has been renamed. It is divided into two components, U-2925A and U-2925B. The A
portion includes constructing the Parkway on the west side of US 52 to Salem Avenue, while the B portion includes constructing the eastern portion to Martin Luther King, Jr. Drive. Right of way is scheduled for 2011 and construction is scheduled to begin in 2013.

The U-2826B project was originally intended to improve US 52 by widening from four-lanes to six-lanes using shoulders on US 52 from I-40 to the future Northern Beltway interchange on the north near NC 65 (Bethania-Rural Hall Road). Through the study process, it was determined that safety improvements were primarily needed between Stadium Drive and Akron Drive. In addition, the project alternatives under consideration were opened to include non-widening options. Construction options were considered from Stadium Drive to Akron Drive, while ITS options were considered for the entire study area from I-40 to NC 65.

### 1.2 Project Setting

#### 1.2.1 Study Area

The study corridor for the project is located within the city limits of Winston-Salem in Forsyth County, North Carolina and runs adjacent to downtown Winston-Salem (Error! Reference source not found.).

The northern boundary of the study corridor is located at the proposed interchange with the Northern Beltway near the interchange of NC 65 and US 52. The southern boundary of the study area is the I-40/US 52 interchange. The eastern and western boundaries of the study area, as shown in Error! Reference source not found., generally are identified as:

**Eastern**

- Old Hollow Road from University Parkway to Germanton Road
- Germanton Road from Old Hollow Road to Oak Summit Road
- Oak Summit Road from Germanton Road to Old Rural Hall Road
- Old Rural Hall Road from Oak Summit Road to Old Walkertown Road
- Brushy Fork Creek from Old Walkertown Road across Business 40/US 421 to Longview Drive
- Longview Drive from Morrison Street to Waughtown Street
- Clemmonsville Road from Waughtown Road to Sprague Street
- East of Carlyle Street from Sprague Street to I-40
Western

- East of US 52 from NC 66 interchange across Ziglar Road to Hanes Mill Road
- Hanes Mill Road from Hanes Mill Road to University Parkway
- University Parkway from Hanes Mill Road to Northwest Avenue
- Marshall Street from Northwest Avenue to Brookstown Avenue
- Brookstown Avenue from Marshall Street to Old Salem Road
- Old Salem Road from Brookstown Avenue to South Main Street
- South Main Street from Old Salem Road to I-40

1.2.2 Geometric Features of the Existing Facility

The study area contains 11.5 miles of the US 52 corridor with 18 interchanges. Two of the interchanges, I-40 and Business 40/US 421, are full cloverleaf interchanges. Six of the interchanges are partial cloverleaf interchanges. The remaining interchanges are diamond interchanges, partial diamond interchanges, and variations on typical interchange designs. The majority of the corridor is comprised of four 12-foot travel lanes with a 16-foot median. The right of way varies along the corridor, ranging from 100 feet near downtown Winston-Salem to 300 feet towards the north end of the study area.

1.2.3 History of US 52 in Winston-Salem

Early transportation studies in the 1950s identified the need to improve north/south mobility through Winston-Salem in the Patterson Avenue/Liberty Street corridor. Engineers, planners, and City leaders recognized the need to improve access to industrial land uses, downtown, and local neighborhoods while connecting directly to the I-40 corridor (currently Business 40/US 421) immediately south of downtown. The multi-lane freeway project (US 52) was designed and implemented in the early 1960s. While the project certainly improved north/south mobility, it also split many of the established neighborhoods of Winston-Salem.

Since its construction, US 52 has been maintained as a freeway and now extends from I-85 in Lexington on the south through Winston-Salem to I-74 in Mount Airy on the north. While the US 52 corridor is the primary north/south route for local and through traffic in the Winston-Salem area, it still exists as a major barrier for the neighborhoods that are adjacent to the freeway. Due to the effects on abutting neighborhoods, projects such as Martin Luther King, Jr. Drive have been implemented to improve connectivity across US 52, but cross connectivity and access continue to be important issues.
The US 52 facility contains two 12-foot travel lanes in each direction with varying shoulder widths and intermittent breakdown areas. A 16-foot paved median with a raised concrete (Jersey type) barrier separates the traffic flow from Business 40/US 421 to Patterson Avenue. North of Patterson Avenue to NC 65 (Bethania-Rural Hall Road), a grass median varies from 12 to 30 feet in width. In the early 1970s, safety improvements, which included drainage, guardrails, and fencing, were added to US 52 between Diggs Boulevard and Peden Street. In 1996, three bridge rehabilitation and bridge rail retrofitting projects were implemented on US 52 starting south of Martin Luther King, Jr. Drive.

1.3 Summary of Need for Proposed Action

Currently, US 52 is a four-lane divided freeway carrying between 50,000 and 69,000 vehicles per day (vpd). This project is focused on three major objectives for the US 52 corridor.

- **Reduce the number of crashes on US 52 from I-40 to 4th Street and at Akron Drive.**
  The crash rate on US 52 from I-40 to 4th Street is 38 percent higher than the rate for comparable highways in North Carolina, and the injury rate is 23 percent higher. From 2003 to 2006, there were 411 crashes along this segment, including 125 crashes that resulted in an injury and 3 that resulted in a fatality. Three of the top five worst interchanges on US 52 in the study area are 3rd/5th Streets (85 crashes), Stadium Drive (61 crashes), and Akron Drive (56 crashes).

- **Improve traffic mobility along US 52.**
  Prior to the completed construction of the eastern section of the Northern Beltway (STIP Projects U-2579 and U-2579A, scheduled to open after 2015), several freeway segments and weaving sections along the US 52 corridor are expected to perform at a very poor level of service, with high levels of congestion during daily peak travel periods.

- **Conform to adopted land use and transportation plans.**
  Improvements to the corridor are intended to be in agreement with the needs and objectives identified in the regional land use and transportation plans and support the future goals of the Winston-Salem Urban Area.

1.4 Safety

Crash data from 2003 to 2006 was analyzed to compare crash rates on US 52 with statewide average crash rates for urban US routes. Along US 52 from I-40 to Akron Drive, a total of 686 crashes, including four crashes involving fatalities and 209 non-fatality injury crashes, were reported. Figure 1.2 shows the crash frequency (number of crashes) at each location along the study corridor (at 1/10-mile intervals). The relative size of the point indicates the number of crashes occurring in that interval for the three year period.
The segment of US 52 within the study area with the highest crash rate is from I-40 to 4th Street. The rest of the study corridor is within or below the statewide average crash rate. There were a total of 411 crashes on this segment, including 125 injury accidents and 3 fatalities. Table 1-1 includes the crashes on this segment and compares the actual US 52 crash rate with the statewide average crash rates and the critical crash rate. The critical crash rate was calculated for the total number of crashes based on NCDOT guidelines. The critical crash rate, described following Table 1-1, is an average crash rate that takes into account factors such as rural or urban roads and the length of the segment. The crash rate for this segment of US 52 is approximately 38 percent higher than the critical crash rate, and the injury rate is approximately 23 percent higher than the critical crash rate.

Table 1-1. US 52 Crash Analysis from I-40 to 4th Street

<table>
<thead>
<tr>
<th>US 52 Number of Crashes</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>411</td>
</tr>
<tr>
<td>Fatal</td>
<td>3</td>
</tr>
<tr>
<td>Injury</td>
<td>125</td>
</tr>
</tbody>
</table>


<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>142.59</td>
</tr>
<tr>
<td>Fatal</td>
<td>0.84</td>
</tr>
<tr>
<td>Injury</td>
<td>42.39</td>
</tr>
</tbody>
</table>

Critical Crash Ratea

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>172.85</td>
</tr>
<tr>
<td>Fatal</td>
<td>3.43</td>
</tr>
<tr>
<td>Injury</td>
<td>59.02</td>
</tr>
</tbody>
</table>

US 52 Crash Ratea

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>238.98</td>
</tr>
<tr>
<td>Fatal</td>
<td>1.74</td>
</tr>
<tr>
<td>Injury</td>
<td>72.68</td>
</tr>
</tbody>
</table>

Safety Ratioe

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>1.38</td>
</tr>
<tr>
<td>Fatal</td>
<td>0.51</td>
</tr>
<tr>
<td>Injury</td>
<td>1.23</td>
</tr>
</tbody>
</table>

NCDOT’s Guidelines for Utilizing NC Statewide Crash Rates states:

A simple comparison of the roadway crash rate vs. the average crash rate would identify nearly one-half of all locations as having a potential highway safety concern. A more appropriate method is the critical crash rate method. This statistical tool can be used to screen for high accident locations, by utilizing a confidence interval that can be adjusted up or down to accommodate the needs of your safety program. If a segment has an actual crash rate higher than the critical rate, the location may have a potential highway safety deficiency and may deem additional analysis.
The additional analyses may include but are not limited to the following: crash pattern studies, severity studies, B/C ratio studies, etc.

To compute the critical crash rate for a site, use the following equation:

\[ F_c = F_a + k(F_a / M) \frac{1}{2} + \frac{1}{2}M \]

where:
- \( F_c \) = the critical crash rate
- \( F_a \) = statewide crash rate of roadway class or average crash rate
- \( K \) = a probability constant. Some values are:
  - \( K = 1.645 \) for a 95% confidence level, commonly used for rural areas
  - \( K = 3.291 \) for a 99.95% confidence level, commonly used for urban areas
- \( M \) = vehicle exposure, the exposure should be calculated in 100mvmt if NC Statewide Rates is used

Another advantage of using the critical crash rate method is because it accounts for exposure. A short segment of roadway could have an extremely high crash rate although the roadway’s crash history identified only a small number of crashes. Locations with low exposure will be measured against a higher critical rate. Thus, the locations that have a small segment length (or low ADT) and low crash counts will not be overflagged when compared to locations that have high ADT’s and high crash counts.

There are five interchanges within the 1.4-mile corridor between Diggs Boulevard and Martin Luther King, Jr. Drive. This does not meet current FHWA design standards, which calls for one-mile spacing between interchanges. The distance between interchanges in this segment ranges from 0.3 miles (from Stadium Drive to Business 40/US 421) to 0.4 miles (Diggs Boulevard to Stadium Drive). This results in short weave sections: the weaving section between Stadium Drive and Business 40/US 421 is 450 feet northbound and 650 feet southbound, and the weaving section between Business 40/US 421 and 3rd/5th Streets is 600 feet northbound and 750 feet southbound.

The potential problems with close interchange spacing can be illustrated with “conflict points.” Conflict points occur when vehicles traveling in different directions cross paths. For example, at an interchange, conflict points are located at the end of on-ramps, the beginning of off-ramps, and in weave sections. Chart 1-1 shows the locations of the conflict points along this segment.
Crashes also were determined for each interchange area along the study corridor. For the purposes of this analysis since the distance between each interchange is relatively short, the boundaries between interchange areas are taken to be halfway between the interchanges (e.g., the Business 40/US 421 interchange goes from halfway between Stadium and Business 40/US 421 to halfway between Business 40/US 421 and 3rd/5th Street). Chart 1-2 shows the number of crashes for each interchange area. Based on this analysis, the highest number of crashes occurs in the vicinity of the Business 40/US 421 interchange. This study focuses on the top five worst interchanges, which are:

1. Business 40/US 421 (143 crashes)
2. 3rd/5th Streets (85 crashes)
3. Diggs/Vargrave Street (73 crashes)
4. Stadium Drive (61 crashes)
5. Akron Drive (56 crashes)
Chart 1-2. Crashes at US 52 Interchange Areas

![Chart showing crashes at US 52 Interchange Areas]

Source: NCDOT

Chart 1-3 shows the frequency of different crash types at the top five worst crash locations along US 52 in the study area. The majority of crashes (approximately 70 percent) along US 52 were either rear-end collisions or vehicles running off the road.
Chart 1-3. Crash Type Summary

Source: NCDOT
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Legend
Number of Crashes (2003-2006)
- 1 - 5
- 6 - 10
- 11 - 25
- 26 - 50
- 51 - 77

Study Area

**FIGURE 1.2**
Crash Frequency Along US 52
US 52 Environmental Assessment TIP Project U-2826B
1.5 System Linkage

1.5.1 Existing Road Network

The existing major road network in Winston-Salem and Forsyth County is largely radial, with most major roads converging on central Winston-Salem. The major freeways and expressways, as shown in Figure 1.1, include I-40, Business 40/US 421, US 311, US 421 west of I-40, and US 52. Of these major routes, only US 52 serves predominantly north/south travel. Major arterial streets parallel to US 52 in the study area include University Parkway, Germanton Road/North Cherry Street, Patterson Avenue, Reynolda Road, and Liberty Street.

1.5.2 Modal Interrelationships

Travel in Winston-Salem is heavily auto-oriented. Other modes of transportation available include local and inter-city bus service, ride-sharing, freight rail service, air service, and motor freight service.

Public Transportation

Bus service in Winston-Salem is provided by the Winston-Salem Transit Authority (WSTA), which provides fixed route bus service throughout Winston-Salem. The WSTA bus service provides 2.8 million riders with 32 routes, including eight night routes, one trolley route, and one shuttle route.

The Piedmont Authority for Regional Transportation (PART) completed the Triad Major Investment Study Preliminary Draft Report in November 2002. This report evaluated two alternatives for regional transit; a Rail Alternative and a Bus Rapid Transit Alternative. Several corridors were examined for these alternatives and include: Winston-Salem to Greensboro along I-40 and Business 40, Winston-Salem to High Point along US 311, and Winston-Salem to Clemmons along I-40. Since the completion of that report, PART has begun the second phase of development with the Triad Transit Alternatives Analysis. The first part of this study was completed in Fall 2003, and identified future needs for the Piedmont Triad region. The current stage of the study builds upon the previous work and will identify and analyze solutions to meet those needs (PART website, www.partnc.org, accessed September 5, 2007).

In addition, PART has teamed with representatives from surrounding areas to conduct a land use study called Heart of the Triad (HOT). The HOT Steering Committee was established by PART, and includes representatives from Forsyth and Guilford Counties; Greensboro, High Point, Winston-Salem, and Kernersville; the four area chambers of commerce; NCDOT; and funding partners. The HOT master planning project is intended to help shape the development of the area between the Dell plant and the future Fed Ex
A public charrette was held in April 2006, and a Land Use and Transportation Plan, Existing Conditions Summary, and Implementation Program were developed in March 2007.

**Freight Rail Service**

There are five freight rail lines that serve Winston-Salem, four of which are within the community impact study area/Martin Luther King, Jr. Drive study area (see Section 3.5.5). The Norfolk Southern Railroad operates an east-west line from Kernersville to downtown Winston-Salem that connects with lines running northeast towards Martinsville, Virginia and southwest along Stratford Road towards Charlotte. The line to Martinsville parallels US 52 from Business 40/US 421 to just north of Liberty Street where it crosses US 52 and continues northeast along Old Walkertown Road. Norfolk Southern also operates a line extending north towards Rural Hall. The fourth line, operated by Winston-Salem Southbound Railway, runs parallel to US 52 south of downtown and connects to Lexington. The final line connects with the Rural Hall line west of the downtown and continues southwest on US 158 towards Clemmons.

**Air Service**

Winston-Salem is served by Smith Reynolds Airport and Piedmont Triad International Airport. Smith Reynolds Airport, located just east of US 52 near Akron Drive, provides general aviation service with commuter and private planes. Piedmont Triad International Airport, located in western Guilford County, serves major airlines and is expected to become a hub for Federal Express in 2009.

**Motor Freight Service**

Winston-Salem is a major transfer point for motor freight service. Numerous freight operators are located in the Winston-Salem area. Substantial truck traffic uses US 52 as well as other major highways in Winston-Salem. The number of trucks is expected to increase substantially with the opening of a Dell, Inc. computer assembly plant in southeastern Winston-Salem near the I-40 and US 311 interchanges with Union Cross Road.

**1.6 Transportation Demand**

In order to understand what improvements would improve safety along the corridor and enable the facility to meet future traffic demand at acceptable levels of service, this study considered existing and projected traffic volumes.

The primary tool used to forecast traffic for this study was the Triad Regional Travel Demand Model. The Travel Demand Model was used to test several alternative improvements to US 52 by forecasting traffic to 2025 (daily, AM and PM peak periods).
1.6.1 Existing Road Network and System Linkage

US 52 is the primary north/south route for through traffic in the Winston-Salem area, and also serves local traffic within Winston-Salem. It connects I-85 in Lexington to I-74 in Mount Airy. The portion of US 52 north of NC 66 will serve as part of the future I-74 corridor. Because US 52 is a significant link between two major interstate corridors, Winston-Salem has become a major transfer point for freight service. Numerous trucking companies are located in the Winston-Salem area. Consequently, tractor trailer semi-trucks constitute a high percentage of the traffic on the major roadway corridors. In May 2001, tractor trailer semi-trucks accounted for nine percent of the daily traffic on US 52. The presence of these trucks in the traffic stream greatly increases the congestion on existing US 52.

1.6.2 Existing and Projected Traffic Volumes

The Triad Regional Travel Demand Model was used to evaluate the main line capacity of US 52 and test the effect that the Northern Beltway will have on the corridor. The base year for the model is 1994 and the design year is 2025. In March 2001, 38 peak hour turning movement counts were conducted at select intersections within the study area. Peak hour counts also were conducted on US 52 at Akron Drive, 4th Street, and Mock Street. The peak hour counts were evaluated to determine the existing capacity and level of service for the intersections and the freeway segments.

The eastern portion of the Winston-Salem Northern Beltway (STIP Project U-2579) is divided into seven sections and will connect US 311 on the south end with US 52 on the north end. The funded portions currently include Sections AA, AB, B, and C, which are all scheduled to begin construction by the year 2013. Based on the assumption that these sections will not carry traffic prior to 2015, traffic projections were interpolated using the Regional Travel Demand Model. The 2015 average daily traffic (ADT) volumes were selected to represent the “worst case” traffic along US 52, expecting that it would occur prior to the opening of the first portions of the Northern Beltway.

Three traffic scenarios were developed to evaluate the capacity deficiencies of the US 52 corridor. The scenarios that were evaluated are listed below.

- 2001 Existing Peak Hour Traffic (Figure 1.3(A-B))
- 2015 Projected Peak Hour Traffic (without the Northern Beltway Eastern Section) (Figure 1.4(A-B))
- 2025 Projected Peak Hour Traffic (with the Northern Beltway Eastern Section) (Figure 1.5(A-B))
FIGURE 1.3A
2001 Existing AM & PM Peak Hour Traffic Volumes
US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
FIGURE 1.3B
2001 Existing AM & PM Peak Hour Traffic Volumes
US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
FIGURE 1.4A
2015 Projected AM & PM
Peak Hour Traffic Volumes
(Without The Northern Beltway)
US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
FIGURE 1.4B
2015 Projected AM & PM
Peak Hour Traffic Volumes
(Without The Northern Beltway)
US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
FIGURE 1.5A
2025 Projected AM & PM
Peak Hour Traffic Volumes
(With The Northern Beltway)
US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
FIGURE 1.5B
2025 Projected AM & PM
Peak Hour Traffic Volumes
(With The Northern Beltway)

US 52 Environmental Assessment
TIP Project U-2826B

LEGEND
XXX AM Peak Hour Traffic Volumes
(XXX) PM Peak Hour Traffic Volumes

NOT TO SCALE
1.6.3 Level of Service (LOS) Analysis

Level of service (LOS) is a qualitative measure of traffic operating conditions specific to each type of transportation facility. Quantitative analysis of traffic volume and capacities determines the appropriate level of service. LOS ranges from LOS A, which is the best condition, to LOS F denoting the worst condition. In urban areas, LOS D generally is considered acceptable while in rural areas, LOS C is considered desirable. US 52 is designated as an urban facility, so traffic conditions worse than LOS D (that is, LOS E or F) are considered to be exceeding the capacity at which the facility can operate safely and efficiently, and are therefore unacceptable. LOS E and F conditions cause substantial travel delay, increase the potential for crashes, and contribute substantially to the inefficient operation of motor vehicles.

Based on the existing and projected daily traffic volumes, the entire US 52 corridor between I-40 and NC 65 is expected to continue operating at its existing level of service until the Northern Beltway is open to traffic (scheduled for 2015). Currently, two of the three segments are operating at an unacceptable level of service (LOS E or F) in either the AM peak hour, the PM peak hour, or both. The traffic volumes indicate that without any improvements, operations on the US 52 corridor segment between Liberty Street and Akron Drive, which is currently operating an acceptable LOS, would worsen to LOS F even after the Northern Beltway is open to traffic. A more detailed presentation of the LOS analysis is presented within this section.

LOS for freeways is determined by the average density or spacing of vehicles (that is, the average number of vehicles per mile) during the AM and PM peak hours. Figure 1.6 shows the locations of the six (three northbound and three southbound) freeway segments that were analyzed as part of the three traffic scenarios discussed in the previous section. A weaving section is defined by the Highway Capacity Manual as “a length of highway over which traffic streams cross paths through lane-changing maneuvers, without the aid of traffic signals; formed between merge and diverge points.” LOS for weaving sections is determined by the average density of vehicles during the AM and PM peak hours. LOS for freeway ramps is based on the traffic density in the merge or diverge area of the ramp. Figure 1.6 shows the locations of the 11 ramp and weave locations that were analyzed as part of these scenarios.

For unsignalized intersections, LOS is determined by the control delay and is defined for each minor movement (for example, a left-turn onto the major street). LOS is not defined for the intersection as a whole. Figure 1.7 shows the locations of the 14 unsignalized intersections that were analyzed as part of these scenarios. For signalized intersections, LOS is related to the control delay for the intersection. The intersection control delay is calculated by estimating the average control delay per vehicle, and then aggregating for each approach and for the intersection as a whole. Figure 1.7 shows the locations of the 22 signalized intersections that were analyzed as part of these scenarios.
FIGURE 1.6
Location of Freeway Segments and Ramp/Weave Sections
US 52 Environmental Assessment
TIP Project U-2826B
FIGURE 1.7
Location of Signalized and Unsignalized Intersections
US 52 Environmental Assessment
TIP Project U-2826B
1.6.3.1 LOS for 2001 Volumes

Based on the 2001 volumes, three of six freeway segment locations on US 52 had unacceptable LOS in the AM peak hour while two segments had unacceptable LOS in the PM peak hour. Table 1-2 summarizes the levels of service for analyzed freeway segments.

Seven ramp and weaving sections had unacceptable LOS in the AM peak hour and six were unacceptable in the PM peak hour. Table 1-3 summarizes the levels of service for the analyzed ramp and weaving sections.

Only two of the fourteen unsignalized intersections had unacceptable LOS in the AM and PM peak hours. Table 1-4 summarizes the results of the analysis for the unsignalized intersections.

All of the 22 signalized intersections have acceptable LOS in the AM and PM peak hours for 2001. Table 1-5 summarizes the results of the analysis for the signalized intersections.

1.6.3.2 LOS for 2015 Volumes

Based on projected traffic volumes for 2015, four freeway segments on US 52 would have unacceptable LOS in both the AM and PM peak hours. Table 1-2 summarizes the levels of service for analyzed freeway segments.

Nine of the ramp and weaving sections have unacceptable LOS in the AM peak hour and seven sections have unacceptable LOS in the PM peak hour. Table 1-3 summarizes the levels of service for the analyzed ramp and weaving sections.

Four of the fourteen unsignalized intersections have unacceptable LOS in the AM and PM peak hours. Table 1-4 summarizes the results of the analysis for the unsignalized intersections.

All of the 22 signalized intersections have acceptable LOS in the AM and PM peak hours for 2015. Table 1-5 summarizes the results of the analysis for the signalized intersections.

1.6.3.3 LOS for 2025 Volumes

Based on projected traffic volumes in 2025, only one freeway segment has unacceptable LOS in the AM and PM peak hours. Table 1-2 summarizes the levels of service for analyzed freeway segments.
Only three ramp and weaving sections have unacceptable LOS in the AM peak hour and two sections have unacceptable LOS in the PM peak hour. **Table 1-3** summarizes the levels of service for the analyzed ramp and weaving sections.

Three of the unsignalized intersections have unacceptable LOS in the AM peak hour and only one intersection has unacceptable LOS in the PM peak hour. **Table 1-4** summarizes the results of the analysis for the unsignalized intersections.

All of the 22 signalized intersections have acceptable LOS in the AM and PM peak hours for 2025. **Table 1-5** summarizes the results of the analysis for the signalized intersections.

**Table 1-2. Level of Service for Freeway Segments**

<table>
<thead>
<tr>
<th>Segment Number</th>
<th>Location</th>
<th>Direction</th>
<th>AM LOS (Density)</th>
<th>PM LOS (Density)</th>
<th>AM LOS (Density)</th>
<th>PM LOS (Density)</th>
<th>AM LOS (Density)</th>
<th>PM LOS (Density)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mock Street</td>
<td>NB</td>
<td>F (--)</td>
<td>D (30.9)</td>
<td>F (--)</td>
<td>D (34.1)</td>
<td>D (32.6)</td>
<td>C (24.3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>(24.0)</td>
<td>E (36.0)</td>
<td>D (26.1)</td>
<td>E (41.5)</td>
<td>C (18.9)</td>
<td>C (27.4)</td>
</tr>
<tr>
<td>2</td>
<td>3rd Street to 5th Street</td>
<td>NB</td>
<td>E (38.1)</td>
<td>E (37.7)</td>
<td>E (44.7)</td>
<td>E (44.0)</td>
<td>D (33.2)</td>
<td>D (33.0)</td>
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<td></td>
<td></td>
<td>SB</td>
<td>E (38.4)</td>
<td>D (34.3)</td>
<td>F (--)</td>
<td>E (38.7)</td>
<td>D (33.4)</td>
<td>D (30.7)</td>
</tr>
<tr>
<td>3</td>
<td>Liberty Street to Akron Drive</td>
<td>NB</td>
<td>C (19.8)</td>
<td>D (28.8)</td>
<td>D (26.2)</td>
<td>E (41.8)</td>
<td>D (27.2)</td>
<td>F (--)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>C (31.9)</td>
<td>C (18.6)</td>
<td>F (--)</td>
<td>C (24.5)</td>
<td>F (--)</td>
<td>C (25.5)</td>
</tr>
</tbody>
</table>

Assumptions: Base free flow speed (FFS) = 65 mph, 1 interchange per mile, rolling terrain, 9% trucks, 1% RVs, PHF = 0.92. **Bold** indicates locations that have unacceptable delay (LOS E or F). "--" indicates density values that correspond to LOS F, which are not calculated for freeway segments. Growth based on Triad Regional Model runs: 2015 = 1.09*2001 volume counts, 2025 = 1.05 (south) or 0.85 (central) or 0.60 (north)(*2001 volume counts).

* Segment Number refers to **Figure 1.6**.
* Assumes that the eastern portion of the Northern Beltway is open.
* Assumes that the eastern portion of the Northern Beltway has been completed and is open for use.
* Passenger cars per lane per mile.

Source: *Purpose and Need Technical Memorandum*, Table 1 (July 2001)
## Table 1-3. Level of Service for Ramps and Weaving Sections

<table>
<thead>
<tr>
<th>Segment Number*</th>
<th>Segment Definition</th>
<th>Scenario Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2001*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AM LOS (Density)c</td>
</tr>
<tr>
<td>1</td>
<td>SB Weave – Stadium Drive to Vargrave Street</td>
<td>B (16.6)</td>
</tr>
<tr>
<td>2</td>
<td>NB Weave – Stadium Drive to Business 40</td>
<td>E (37.6)</td>
</tr>
<tr>
<td>3</td>
<td>NB Weave – Business 40 Loops</td>
<td>F (44.3)</td>
</tr>
<tr>
<td>4</td>
<td>SB Weave – Business 40 Loops</td>
<td>E (35.2)</td>
</tr>
<tr>
<td>5</td>
<td>NB Weave – Business 40 to 3rd Street</td>
<td>F (48.6)</td>
</tr>
<tr>
<td>6</td>
<td>SB Weave – 3rd Street to Business 40</td>
<td>E (41.9)</td>
</tr>
<tr>
<td>7</td>
<td>NB Weave – 5th Street to MLK, Jr. Drive</td>
<td>D (31.2)</td>
</tr>
<tr>
<td>8</td>
<td>SB Weave – 11th Street to MLK, Jr. Drive</td>
<td>E (35.6)</td>
</tr>
<tr>
<td>9</td>
<td>SB Weave – Liberty Street to 14th Boulevard</td>
<td>E (39.0)</td>
</tr>
<tr>
<td>10</td>
<td>NB Merge Ramp – Liberty Street</td>
<td>D (34.3)</td>
</tr>
<tr>
<td>11</td>
<td>NB Merge Ramp – Akron Drive</td>
<td>C (21.7)</td>
</tr>
</tbody>
</table>

Assumptions: Base free flow speed (FFS) = 65 mph, 1 interchange per mile, rolling terrain, 9% trucks, 1% RVs, PHF = 0.92.

**Bold** indicates locations that have unacceptable delay (LOS E or F).

“--” indicates density values that corresponds to LOS F, which are not calculated.

Growth based on Triad Regional Model runs: 2015 = 1.09*2001 volume counts, 2025 = 1.05 (south) or 0.85 (central) or 0.60 (north)(*2001 volume counts).

*Segment Number refers to Figure 1.6.

*Assumes that the eastern portion of the Northern Beltway is not open.

*Assumes that the eastern portion of the Northern Beltway has been completed and is open for use.

*Passenger cars per lane per mile.

Source: *Purpose and Need Technical Memorandum*, Table 2 (July 2001)
### Table 1-4. LOS for Unsignalized Intersections

<table>
<thead>
<tr>
<th>Intersection Number*</th>
<th>Major Street</th>
<th>Minor Street(s)</th>
<th>Scenario Year</th>
<th>AM LOS (Delay)(^c)</th>
<th>PM LOS (Delay)(^c)</th>
<th>AM LOS (Delay)(^c)</th>
<th>PM LOS (Delay)(^c)</th>
<th>AM LOS (Delay)(^c)</th>
<th>PM LOS (Delay)(^c)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>2001</td>
<td>2015(^b)</td>
<td>2025(^b)</td>
<td>2015(^b)</td>
<td>2025(^b)</td>
<td>2015(^b)</td>
<td>2025(^b)</td>
</tr>
<tr>
<td>1</td>
<td>Indiana Avenue</td>
<td>Akron Drive</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>C (17.1)</td>
<td>C (19.6)</td>
<td>C (20.1)</td>
<td>C (24.4)</td>
<td>B (11.1)</td>
<td>B (11.5)</td>
</tr>
<tr>
<td>2</td>
<td>Northwest Boulevard</td>
<td>US 52 Southbound Ramp</td>
<td></td>
<td>B (10.6)</td>
<td>B (11.4)</td>
<td>B (10.9)</td>
<td>B (11.8)</td>
<td>B (10.2)</td>
<td>B (10.7)</td>
</tr>
<tr>
<td>3</td>
<td>Liberty Street</td>
<td>Linden Street</td>
<td></td>
<td>B (10.8)</td>
<td>B (10.6)</td>
<td>B (11.1)</td>
<td>B (10.9)</td>
<td>B (10.2)</td>
<td>B (10.2)</td>
</tr>
<tr>
<td>4</td>
<td>Liberty Street</td>
<td>US 52 Northbound Ramp</td>
<td></td>
<td>B (12.6)</td>
<td>C (15.6)</td>
<td>B (13.5)</td>
<td>B (17.8)</td>
<td>B (11.4)</td>
<td>B (13.1)</td>
</tr>
<tr>
<td>5</td>
<td>Liberty Street</td>
<td>12th Street</td>
<td></td>
<td>B (12.4)</td>
<td>C (17.3)</td>
<td>B (13.2)</td>
<td>C (20.0)</td>
<td>B (11.4)</td>
<td>B (14.4)</td>
</tr>
<tr>
<td>6</td>
<td>MLK, Jr. Drive</td>
<td>Linden St./Brenner St.</td>
<td></td>
<td>D (29.8)</td>
<td>E (42.2)</td>
<td>E (43.2)</td>
<td>F (66.7)</td>
<td>C (19.9)</td>
<td>D (25.0)</td>
</tr>
<tr>
<td>7</td>
<td>MLK, Jr. Drive</td>
<td>US 52 Northbound Ramps</td>
<td></td>
<td>B (14.5)</td>
<td>B (13.6)</td>
<td>C (16.2)</td>
<td>B (14.7)</td>
<td>B (12.7)</td>
<td>B (12.2)</td>
</tr>
<tr>
<td>8</td>
<td>3rd Street</td>
<td>Linden Street</td>
<td></td>
<td>B (13.1)</td>
<td>B (12.2)</td>
<td>B (13.7)</td>
<td>B (12.8)</td>
<td>B (12.0)</td>
<td>B (11.3)</td>
</tr>
<tr>
<td>9</td>
<td>Stadium Drive</td>
<td>Vargrave Street</td>
<td></td>
<td>E (38.8)</td>
<td>D (28.9)</td>
<td>F (71.8)</td>
<td>E (38.1)</td>
<td>F (54.1)</td>
<td>D (33.4)</td>
</tr>
<tr>
<td>10</td>
<td>Vargrave Street</td>
<td>US 52 Northbound Ramps</td>
<td></td>
<td>B (12.8)</td>
<td>A (10.0)</td>
<td>B (13.6)</td>
<td>B (10.2)</td>
<td>B (13.2)</td>
<td>A (9.8)</td>
</tr>
<tr>
<td>11</td>
<td>Vargrave Street</td>
<td>US 52 Southbound Ramps</td>
<td></td>
<td>B (10.6)</td>
<td>B (11.3)</td>
<td>B (10.9)</td>
<td>B (11.7)</td>
<td>B (10.8)</td>
<td>B (11.5)</td>
</tr>
<tr>
<td>12</td>
<td>Sprague Street</td>
<td>US 52 SB Ramp/Glendale</td>
<td></td>
<td>E (39.6)</td>
<td>E (49.9)</td>
<td>E (49.9)</td>
<td>F (65.7)</td>
<td>E (44.5)</td>
<td>F (59.3)</td>
</tr>
<tr>
<td>13</td>
<td>Sprague Street</td>
<td>US 52 Northbound Ramp</td>
<td></td>
<td>D (32.6)</td>
<td>D (29.7)</td>
<td>F (50.6)</td>
<td>E (39.1)</td>
<td>E (40.1)</td>
<td>D (34.9)</td>
</tr>
<tr>
<td>14</td>
<td>1st Street</td>
<td>I-40 Bus WB Ramp/</td>
<td></td>
<td>C (21.7)</td>
<td>C (20.6)</td>
<td>D (26.5)</td>
<td>C (24.2)</td>
<td>C (24.1)</td>
<td>C (22.5)</td>
</tr>
</tbody>
</table>

**Assumptions:** PHF = 0.90; 2% heavy vehicles except on ramps where 5% is used.

**Bold** represents locations that have unacceptable delay.

Growth based on Triad Regional Model runs: 2015 = 1.09*2001 volume counts, 2025 = 1.05 (south) or 0.85 (central) or 0.60 (north)\(^*\)2001 volume counts.

*Intersection numbers refer to **Figure 1.7** and are coded in green for unsignalized intersections.

For 2015, the scenario assumes that the eastern portion of the Northern Beltway is under construction and not open. For 2025, the scenario assumes that the eastern portion of the Northern Beltway has been completed and is open for use.

*The level of service is defined for the worst case movement.

**Source:** *Purpose and Need Technical Memorandum*, Table 4 (July 2001)

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### Table 1-5. LOS for Signalized Intersections

<table>
<thead>
<tr>
<th>Intersection Number*</th>
<th>Major Street</th>
<th>Minor Street(s)</th>
<th>AM LOS (Delay)</th>
<th>PM LOS (Delay)</th>
<th>AM LOS (Delay)</th>
<th>PM LOS (Delay)</th>
<th>AM LOS (Delay)</th>
<th>PM LOS (Delay)</th>
</tr>
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<tbody>
<tr>
<td>1 Akron Drive</td>
<td>US 52 Southbound Ramps</td>
<td>B (17.5) B (19.4) A (8.3) B (18.1) B (18.5) B (20.5) A (7.5) B (16.8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Akron Drive</td>
<td>Ogburn Avenue</td>
<td>A (8.6) A (8.5) A (8.5) A (8.9) A (7.6) A (7.6)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Liberty Street</td>
<td>Akron Drive</td>
<td>B (16.4) B (12.4) B (17.4) B (12.8) B (14.0) B (11.3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Liberty Street</td>
<td>28th Street</td>
<td>B (17.2) B (16.4) C (21.9) B (19.5) B (13.7) B (13.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 25th Street</td>
<td>Cleveland Avenue</td>
<td>B (11.7) B (12.1) B (11.9) B (12.3) B (11.1) B (11.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Liberty Street</td>
<td>25th Street</td>
<td>A (7.8) A (8.5) A (8.0) A (8.7) A (7.3) A (7.8)</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>7 Liberty Street</td>
<td>North West Blvd./14th St.</td>
<td>B (11.4) B (11.8) B (11.6) B (12.1) B (11.1) B (11.4)</td>
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<tr>
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</tr>
<tr>
<td>9 MLK, Jr. Drive</td>
<td>Cleveland Avenue</td>
<td>A (9.9) A (11.2) A (10.0) B (11.5) A (9.7) B (10.8)</td>
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</tr>
<tr>
<td>10 5th Street</td>
<td>Linden Street</td>
<td>A (7.4) A (9.2) A (7.6) A (9.2) A (7.0) A (9.1)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>11 5th Street</td>
<td>US 52 SB Ramp/Maple Ave.</td>
<td>B (14.0) A (9.8) B (15.2) A (9.9) B (12.6) A (9.6)</td>
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</tr>
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<td>12 5th Street</td>
<td>US 52 Northbound Ramps</td>
<td>B (13.7) B (12.6) B (15.3) B (13.0) B (12.2) B (12.2)</td>
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<td></td>
</tr>
<tr>
<td>13 5th Street</td>
<td>MLK, Jr. Drive</td>
<td>B (15.3) B (10.4) B (15.9) B (10.7) B (14.5) A (10.0)</td>
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</tr>
<tr>
<td>14 3rd Street</td>
<td>US 52 SB Ramp/Maple Ave.</td>
<td>B (11.4) B (13.9) B (11.6) B (15.0) B (11.1) B (12.7)</td>
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</tr>
<tr>
<td>15 3rd Street</td>
<td>US 52 NB Ramp/Metropolitan</td>
<td>B (11.2) B (11.3) B (11.4) B (11.4) B (10.8) B (11.1)</td>
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<td></td>
</tr>
<tr>
<td>16 MLK, Jr. Drive</td>
<td>1st St./I-40 Bus WB Ramp</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>17 MLK, Jr. Drive</td>
<td>Excelsior/Lowery</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>18 Main Street</td>
<td>I-40 Bus Westbound Ramp</td>
<td>C (20.1) A (9.2) C (25.7) A (9.3) C (23.0) A (9.2)</td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>19 Stadium Drive</td>
<td>US 52 Southbound Ramps</td>
<td>B (15.5) C (21.8) B (15.8) C (23.6) B (15.7) C (22.7)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 MLK, Jr. Drive</td>
<td>Stadium Drive</td>
<td>B (18.6) B (19.4) B (19.2) C (20.9) B (18.9) C (20.2)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>21 Main Street</td>
<td>Sprague Street</td>
<td>A (9.5) A (9.6) A (10.0) A (9.8) A (9.8) A (9.7)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>22 Sprague Street</td>
<td>Old Lexington Road</td>
<td>B (10.4) B (12.3) B (10.7) B (13.6) B (10.5) B (12.9)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assumptions: PHF = 0.90; 2% heavy vehicles except on ramps where 5% is used; 4.0 sec Yellow, 2.0 sec All-Red. Bold represents locations that have unacceptable delay.

Growth based on Triad Regional Model runs: 2015 = 1.09*2001 volume counts, 2025 = 1.05 (south) or 0.85 (central) or 0.60 (north) *2001 volume counts.

*Intersection numbers refer to Figure 1.7 and are coded in blue for signalized intersections.

For 2015, the scenario assumes that the eastern portion of the Northern Beltway is under construction and not open. For 2025, the scenario assumes that the eastern portion of the Northern Beltway has been completed and is open for use.

Source: Purpose and Need Technical Memorandum, Table 3 (July 2001)
1.7 Transportation and Land Use Plans and Other Transportation Documents

The US 52 corridor is addressed in existing transportation and land use plans as noted in the following sections.

1.7.1 Winston-Salem Urban Area 2030 Multi-Modal Long Range Transportation Plan (LRTP)

The *Winston-Salem Urban Area 2030 Multi-Modal Long Range Transportation Plan (LRTP)* was adopted by the Winston-Salem Urban Area Transportation Advisory Committee (TAC) on March 31, 2005. Amendments were adopted by the TAC on July 21, 2005 and the 2030 LRTP (as amended) was approved by the NCDOT on September 30, 2005. The 2030 LRTP is shown in Figure 1.8. The 2030 LRTP includes a fiscally constrained plan that identifies projects and priorities. Proposed improvement projects from the 2030 LRTP for US 52 are shown in Table 1-6. As shown in the table, Project U-2826B is proposed to be constructed in two phases in the 2030 LRTP, the first phase between 2005 and 2014, and the second phase between 2015 and 2020.

Table 1-6. LRTP Schedule of Improvements for US 52

<table>
<thead>
<tr>
<th>Year of Construction</th>
<th>STIP Project Number</th>
<th>Proposed Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 – 2014</td>
<td>U-2925</td>
<td>Salem Creek Connector - Salem Avenue to SR 4325 (Martin Luther King, Jr. Drive) Widen to Multi-Lanes with Part on New Location</td>
</tr>
<tr>
<td>2015 – 2020</td>
<td>U-2826B***</td>
<td>US 52 - I-40 Bypass to Proposed Northern Beltway (Western Loop) Interchange. Widen and Upgrade Roadway and Interchanges. (Patterson Avenue to University Parkway (SR 4000) Construct Improvements to allow the use of Existing Shoulders as Travel Lanes.)</td>
</tr>
</tbody>
</table>

* Not included in the 2030 LRTP. Source for Project U-2826A: Draft 2008-2015 STIP
** NCDOT plans to do all improvements at same time rather than over the planned 2005 – 2014 time period.
*** This portion of the project will be considered as a separate project at a later date if warranted, and is not part of Project U-2826B as discussed in this document.

1.7.2 Winston-Salem/Forsyth County Thoroughfare Plan

The 2005 *Winston-Salem Urban Area Thoroughfare Plan*, the street and highway component of the 2030 LRTP, looks beyond the planning horizon of 2030. The intent of a thoroughfare plan is to ensure that individual transportation projects form a comprehensive, continuous, and coordinated system. The 2005 *Winston-Salem Urban Area Thoroughfare Plan* is shown in Figure 1.9.
2030 Long Range Transportation Plan

Note: the alignment of the proposed roads as shown is a general location which may change as patterns of surrounding development become more definite, and/or when the necessary planning and engineering studies are completed.
FIGURE 1.9
2005 Winston-Salem Urban Area Thoroughfare Plan
US 52 Environmental Assessment TIP Project U-2826B

Note: The alignment of the proposed roads as shown is a general location which may change as patterns of surrounding development become more definite, and/or when the necessary planning and engineering studies are completed.
1.7.3 US 52 Corridor Land Use and Transportation Plan

The City of Winston-Salem has completed a comprehensive land use and transportation plan for the US 52 corridor (US 52 Corridor Land Use and Transportation Plan, 2003). This plan concluded that long-term widening to six lanes and relocation of portions of US 52 on new alignment would support a broad range of community goals. This project comes with a $460 million price tag that would be in addition to the $351 million Northern Beltway (Eastern Section), which is the top priority transportation project in the region as determined by regional leaders. The eastern portion of the Northern Beltway is partially unfunded in the Draft 2008-2015 STIP, leading to a conclusion that major widening of US 52 would occur no sooner than 2015. The Locally Preferred Alternative identified in the corridor study calls for the widening of US 52 to a continuous six-lane freeway along the entire 12-mile corridor from I-40 to the proposed Northern Beltway. The plan also includes major modifications to several of the interchanges and the realignment of portions of US 52.

1.7.4 NCDOT State Transportation Improvement Program (STIP)

The approved NCDOT 2007-2013 STIP designates the US 52 roadway improvements from I-40 to the proposed Winston-Salem Northern Beltway as STIP Project U-2826. This project is designated as a Strategic Highway Corridor Project with portions proposed to be implemented as design-build projects. The length of the proposed construction project is approximately 12 miles long.

The most current STIP is the NCDOT Draft 2008-2015 STIP. According to the Draft 2008-2015 STIP, the right-of-way acquisition is scheduled to begin in fiscal year (FY) 2008 and construction is scheduled to begin in FY 2009. This study, designated as Project U-2826B, which includes a construction cost of $18.29 million, is part of Project U-2826. No funds currently are allocated for the buildout of US 52 to six lanes (proposed in the US 52 Corridor Land Use and Transportation Plan, 2003) in the NCDOT Draft 2008-2015 STIP.

Section 3.2.4 lists all of the NCDOT Draft 2008-2015 STIP projects near US 52. Two projects, Project U-2826A and Project U-2925, are within the Project U-2826B study area. Project U-2826A is also part of Project U-2826, and is to replace the bridges over the Norfolk Southern Railroad south of Akron Drive. Although Project U-2826A is within the Project U-2826B study area, it is unrelated to the operational improvements proposed as part of this project, and is appropriate to be addressed as a separate project.

Project U-2925 is to build the Salem Creek Connector from Salem Avenue to Martin Luther King, Jr. Drive. Project U-2925 will provide additional east-west connectivity.
through Winston-Salem, which is unrelated to the purpose and need of Project U-2826B. Therefore, it is also appropriate to address Project U-2925 as a separate project.

1.7.5 Legacy Development Guide

The City-County Planning Board (CCPB), which consists of Forsyth County, the City of Winston-Salem, and other municipalities within Forsyth County, has developed the Legacy Development Guide, which was adopted in 2001 by Forsyth County and all eight of its municipalities.

The Legacy Development Guide predicts that by 2015, downtown Winston-Salem will be the spiritual and physical center of Winston-Salem. Much of the focus will be on redeveloping downtown in relation to the arts, cultural resources, tourism, residential uses, commercial uses, and office uses. The Legacy Development Guide envisions making the downtown area more pedestrian friendly; it also would serve a variety of connections between multiple modes of transportation. Although the Legacy Development Guide does not refer to the widening of US 52, 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. Thus, the proposed improvements would support the visionary goals stated in the Legacy Development Guide.

1.8 Purpose for Proposed Action

The overall purpose of the proposed project is to provide geometric and operational improvements that improve safety and mobility. This overall purpose is further detailed in the following three statements:

- **Reduce the number of crashes on US 52 from I-40 to 4th Street and at Akron Drive.**
  
  *Needs Addressed:* Improvements to the geometry and closure of ramps at the interchanges of US 52 with Stadium Drive, Akron Drive, 3rd/4th/5th Streets; and the conversion of shoulders to travel lanes from Business 40/US 421 to Martin Luther King, Jr. Drive is likely to reduce the number of conflict points along the corridor. These existing conflict points, combined with the high traffic volumes and travel speed, contribute to the above average crash rates for these areas along the corridor. Increased use of ITS measures also is expected to improve safety by providing better traveler information along the corridor and helping NCDOT and local authorities to react quickly and appropriately to various traffic incidents.

- **Improve mobility for traffic traveling on US 52 through the Winston-Salem area.**
  
  *Needs Addressed:* Geometry improvements, including the use of the existing shoulders as travel lanes, interchange enhancements, elimination of interchanges,
and ITS measures, could have a direct impact on the mobility of the facility and allow for more efficient travel through Winston-Salem.

- **Comply with goals and objectives in existing land use and transportation plans for US 52 in the Winston-Salem area.**
  
  *Needs Addressed:* Compliance with previously outlined goals and objectives has increased local support of the preferred alternative and assisted the region in addressing some of those goals through this project.

A secondary purpose for this project is to reduce the barrier effect between the communities located on the east and west sides of the corridor. As described in **Section 3.3.2.1**, the construction of US 52 in the 1960s separated the residents on the eastern side of Winston-Salem from downtown. Improvements to Martin Luther King, Jr. Drive, which crosses the US 52 corridor, would enhance connectivity within the community.