1.0 DESCRIPTION OF PROPOSED ACTION

The proposed project involves the construction of a new, four-lane roadway from Stadium Drive to Third Street partially within a former railroad corridor southeast of downtown Winston-Salem. The total project length is 0.7 miles, with a southern terminus tying to existing Stadium Drive and connecting to the anticipated location of the Salem Creek Connector. The northern terminus of the project would tie to Linden Street at Third Street. The new roadway, designated Research Parkway (NCDOT TIP U-4918), would serve as the spine to proposed development and connecting side streets. Research Parkway would also form an important connection within the existing street grid, provide a new roadway undercrossing of Interstate 40 Business (I-40B), and serve as a traffic reliever and/or alternate route for existing roadways in the surrounding area.

A separate but related project will construct stormwater management facilities in the vicinity that will provide stormwater management for the Research Park’s contributing watershed north of I-40B. The stormwater facilities are being funded predominately by the City of Winston-Salem and includes culvert replacement/realignment as well as pond construction and stream restoration/stabilization.

An earlier project consolidated several rail lines and side tracks, which eliminated unused tracks and provided a corridor under the existing I-40B overpass for the proposed new north-south connecting roadway.

1.1 Project History & Description

Piedmont Triad Research Park (PTRP), a not-for-profit subsidiary of Wake Forest University Health Sciences (WFUHS), is located in Winston-Salem, North Carolina. WFUHS has a medical research program that includes academic and research operations within the Wake Forest University School of Medicine. To support this, WFUHS is in the process of developing the Research Park in downtown Winston-Salem. The Research Park is being implemented in phases and involves the re-development of numerous properties, many of which are vacant commercial and industrial sites.

The Research Park vicinity (Figure 1) is surrounded by a variety of land uses and distinctive neighborhoods. Immediately to the west of the Research Park is Winston-Salem's downtown and central business district, which contains a mix of commercial and government uses, including City Hall and County Government offices. The Goler/Depot Street community, a historic African-American neighborhood, lies north of the North District of the Research Park.

The Research Park is centrally located near Wake Forest University Baptist Medical Center (WFUBMC), Winston-Salem State University, the N.C. School of the Arts, and Salem Academy and College, which will provide a location for branches of those schools to interact on one campus setting. A more detailed history is in Appendix A.

A project is currently underway to rehabilitate, realign and consolidate the rail lines that pass through the Research Park, which is being undertaken utilizing a portion of earmarked federal funds from the “Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users” (SAFETEA-LU, a Federal transportation law enacted August 10, 2005). The rail project was documented under a separate NEPA Categorical
Exclusion approved by NCDOT on August 24, 2006 (Appendix B). The remainder of the SAFETEA-LU earmark, which was a single line-item designated for “Transportation Improvements at Piedmont Triad Research Park”, would be used to construct the Research Parkway.

The Study Area for the project documented herein includes the Central District and the northern half of the South District to be affected by the proposed roadway (Figures 1-4). This Research Parkway project is listed in the Winston-Salem 2030 LRTP as the one-mile “Research Park Boulevard” with a “local” federal functional classification.

1.2 Project Study Area Boundaries

The 116-acre Study Area generally includes the areas of the Central District and the northern half of the South District that would be affected by the proposed roadway and related stormwater and utility improvements (Figures 2-4). Section 1.3 below further explains the three Districts of the Research Park.

The South District of the Research Park is bounded by Salem Creek on the south, the Winston-Salem Southbound Railroad (WSSB) on the east, I-40 on the north, and Salem Avenue on the west (Figures 2 and 4). The Central District is bounded on the south by Interstate 40 Business (I-40B), on the east by US Highway 52 (US 52), on the north by 3rd Street just east of downtown, and on the west by the Norfolk Southern Railways (NS) K- and R-Lines (Figures 2-4).

The proposed 4-lane road that is the subject of this document, Research Parkway, would run north-south to connect the Central and South Districts with the existing street network. The southern terminus at Stadium Drive would connect with the proposed Salem Creek Connector. The Salem Creek Connector (NCDOT TIP number U-2925, sections A and B) would create a new roadway to tie Stadium Drive to Martin Luther King Jr. Drive (near Reynolds Park Rd.) and create a new interchange at US 52.

1.3 PTRP Master Plan

The PTRP Master Plan (Sasaki 2003), as shown in Figures 2 and 3, organizes the 185-acre Research Park into three major districts. Each district will have a distinct character and development focus:

- North District -- Research and Mixed-use
- Central District -- Biomedical Campus
- South District -- Academic and Research

“Facilities developed within all three districts will support a variety of technology-driven commercial and educational enterprises, with the development responding to topography rather than concealing it. There are a number of historic and architecturally significant buildings in the North District that will likely be retained because of their contribution to the character of Winston-Salem. Other buildings that have economic value and that contain uses that are consistent with the long-term vision for the Park will also be retained.” (PTRP 2007)
The Master Plan establishes areas of open space that abut vehicular and pedestrian connections linking the three districts. The design and layout of the districts is intended to integrate the Research Park with the nearby Goler/Depot Street community, the Arts District, the new downtown Restaurant Row, East Winston, and the Central Business/Financial District. Stadium Drive is an important transportation component, as it connects both Salem Academy/College (to the west) and Winston Salem State University (to the east) with the South District (Figure 1). The future road network for the Research Park would be in conformance with existing transportation plans and initiatives. The Research Park lies 2.5 miles southwest of Smith Reynolds Airport, a public regional airport facility.

1.4 Funding & Cost Estimates

The proposed Federally-funded action (the construction of Research Parkway) is to use funds from the aforementioned SAFETEA-LU earmark for design and construction of Research Parkway. While Research Parkway is being built using SAFETEA-LU funding, construction will also commence on utility- and stormwater-related facilities in the vicinity. State funding from the Clean Water Management Trust Fund (CWMTF) is being used to design and construct stormwater improvements and Bath Branch culvert relocation. Various sources of economic development grants may be used to help fund other portions of the Research Park’s infrastructure. In the future, it is possible that other state or federal grant programs may also adopt all or portions of this NEPA document.

TIP Project U-4918, which is listed as “Piedmont Triad Research Park Transportation Improvements”, has a total project cost of $11,816,000 in the 2009-2015 NCDOT TIP. U-4918 includes the Research Parkway improvements covered in this EA, as well as the rail improvements (covered under a previous Categorical Exclusion) that are currently under construction. For FY 2009, $516,000 is listed as Discretionary funds, $1,187,000 as Federal-Aid High Priority funds, and $426,000 as Other funds. The cost in prior years is listed at $9,687,000, which would mostly be attributed to the rail improvements portion of U-4918. In the 2007-2013 TIP, the total project cost was listed at $12,296,000, with $1,653,000 in prior year costs.

The preliminary cost estimates for the Research Parkway and stormwater projects are as follows, as provided by Stimmel Associates, P.A. and CNA Consulting. The costs for the stormwater improvements and stream restoration work listed below will be borne by the City and CWMTF, not NCDOT or the SAFETEA-LU funding source. Note that no right-of-way costs are listed, as the property is already owned by PTRP:
### TABLE 1  Preliminary Costs, by Category

<table>
<thead>
<tr>
<th>Type of Work</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway / Earthwork / Drainage</td>
<td>$ 2,047,995.10</td>
</tr>
<tr>
<td>Utilities</td>
<td>1,783,986.00</td>
</tr>
<tr>
<td><strong>Subtotal (+20% contingency)</strong></td>
<td><strong>$ 4,598,377.32</strong></td>
</tr>
<tr>
<td>Stormwater Improvements &amp; Stream Restoration</td>
<td>10,878,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$15,476,377.32</strong></td>
</tr>
</tbody>
</table>
2.0 PURPOSE AND NEED

2.1 Purpose of Project

The purpose of the project is to improve connectivity and access to property between Stadium Drive and Third Street near downtown Winston-Salem. The project would provide access to properties while funneling future development-related traffic to existing streets in a strategic manner that is compatible with the existing and proposed transportation network.

2.2 Need for Project

The existing north-south surface roadways in the Study Area (Chestnut Street, Salem Avenue, Patterson Avenue, and Linden Street) do not provide a direct surface connection between areas of the city north and south of I-40B and the Central and South Districts of the Research Park, which greatly limits the traffic circulation, connectivity and functionality of land uses proposed in the vicinity. With I-40B and railroad lines bisecting the two Districts, a new roadway is necessary to link the South District with the remainder of the Research Park and downtown.

Existing regional plans, including the Winston-Salem MPO LRTP and the NCDOT TIP as noted in Section 2.2.4 below, envision an extension of the Salem Creek Connector through to Linden Street; Research Parkway would function as this extension into the Central Business District (CBD). Salem Creek Connector is planned to be a four-lane divided roadway based on preliminary planning documentation from NCDOT.

The Research Park’s tenants will likely include research labs and instructional classrooms for the area’s universities, administrative offices, and private sector mixed-use space that will rely on interaction with one another for their success.

2.2.1 Land Use and System Linkage

The Research Parkway/PTRP study area is directly adjacent to the downtown Winston-Salem CBD, which has an urban grid pattern of streets. The whole Research Park concept and design attempt to extend the downtown development pattern and street network into the PTRP site.

The Research Park is crisscrossed by railroad lines and limited access expressways, which have made the existing city streets difficult to extend into or across the PTRP site. A recent project that consolidated the rail lines has opened up opportunities to extend streets into and through the PTRP Central District.

The nearest north-south surface streets that are continuous and connect the area with Stadium Drive (south) and the Third Street area (north) is Church Street to the west or Martin Luther King Jr. Drive to the east. These Streets are separated by a distance of approximately one mile.

Research Parkway and its associated connecting roadways would provide the primary access route (both vehicular and pedestrian) through the Research Park site. It is intended to be a through street for the Research Park and to allow for easy access into the Park from other downtown through streets. Accommodations
for pedestrian and bicycle passage would provide a new north-south corridor for those users, with access under the railroad and I-40B provided by Research Parkway and the adjacent sidewalks. Research Parkway would also help the community to develop the Research Park to meet its stated expectations, based on the various land use plans that have been adopted by the City and County.

### 2.2.2 Economic Development

The Research Park is meant to provide the Piedmont Triad with a new biotechnology employment sector to replace jobs eliminated by tobacco and textile manufacturing. Additionally, the community is pushing to use the Research Park to continue the urban renewal that Winston-Salem has been able to foster over the past ten years. The property within the Study Area is highly underutilized and currently acts as an economic barrier between downtown and the eastern portion of the City. The Research Park has the potential to bridge this divide and re-unite East Winston with downtown.

This project is one of the largest urban-based research park initiatives in the country. It will provide the State with the geographically diversified biotechnology infrastructure required for North Carolina to maintain its leadership position in a highly competitive, nationwide economic development effort aimed at attracting and growing biotechnology-based businesses as a means of stimulating new business and job creation.

The Triad has seen a significant decline in the tobacco, textile, and furniture business sectors. In order to replace these lost jobs with sustainable employment opportunities, local and state leaders have invested the community in technology-based economic development. This stimulation of business development and entrepreneurship, and their associated job growth, will be a much-needed boost for the Triad region. At completion of the Research Park, as estimated by Economics Research Associates of Washington, D.C., the Park will enhance annual full-time employment by 11,700 direct jobs.

At completion of all three districts of the Research Park, it could provide nearly 5.6 million square feet of laboratory, office, educational, and mixed-use space and provide the opportunity for economic redevelopment of the entire Piedmont Triad region of North Carolina.

The Research Park is proposed to utilize a brownfields agreement in order to address existing soil and groundwater contamination from past uses on much of the subject property. This will help streamline the process of cleaning up hazardous contamination while allowing the redevelopment to proceed. The proposed Research Parkway would provide a new route for local traffic to enter downtown from areas south of I-40B, partially overcoming barriers to local traffic circulation created by limited access expressways and railroad lines in the vicinity.
2.2.3 Transportation and Access Need

The roadway network surrounding the Study Area is a mature grid system with major, limited-access east-west (I-40B) and north-south (US 52) arterials absorbing the through traffic. There are presently no congestion problems on the existing city street grid surrounding the project area. Congestion may exist on I-40B and US 52, but the Study Area is isolated from those facilities by grade separations. Separate projects are planned to address capacity needs on those roadways (U-2827B and U-2826, see Section 2.2.4 below).

Improvements planned as part of U-2826 (US 52) include removing interchange ramps at Stadium Drive, Third Street and Fourth Street in order to improve safety at the US 52 / I-40B interchange. This would effectively eliminate US 52 for short local north-south trips, dispersing such trips onto the surrounding street network. The proposed Research Parkway would serve many of these trips. Similarly, construction of the Salem Creek Connector (U-2925) will funnel traffic into the Study Area, which would then be dispersed onto the existing street network without Research Parkway to receive such trips.

The Study Area consists of 116 acres of currently undeveloped or underdeveloped land in the Central and South Districts of the Research Park. As that land develops and trips to-and-from the Study Area are generated, it can be expected that traffic capacity on the surrounding streets would be affected.

A traffic study was performed to:

- Document traffic capacity of the existing surrounding roadway network with current 2007 traffic volumes. (See Figure 5)
- Predict growth in traffic that will occur with and without proposed development in the study corridor. A study prepared in 2007 as part of the Piedmont Triad Research Park predicted that the overall 185-acre Research Park would generate a total of 20,000 trips. These trips will load onto the existing surrounding street network.
- Ensure intersections with existing city streets have the proper lanes and meet design criteria to maintain acceptable levels of service.

2.2.4 Other Highway Projects in the Area

Projects included in the 2009-2015 TIP in the vicinity of Research Parkway are listed below and are shown in Figure 6. The following project will have a direct influence on traffic operations:

**U-2925** – Salem Creek Connector, Salem Avenue to SR 4325 (MLK Jr. Dr.). Project includes widening existing 2-lanes to 4-lanes, with part on new location. The project is approximately one mile in length and would likely include removal of the existing US 52/Third Street interchange. Based on the 2009-2015 TIP, Section A (from Salem Avenue to US 52) and Section B (from US 52 to MLK Jr. Dr.) right-of-way acquisition is scheduled in FY 2012 and construction in FY 2014 at the earliest.
Preliminary design and a Federal NEPA document are currently under development.

Two other projects that affect the limited access facilities adjacent to the Study Area are described below. These are upgrades to existing facilities and are not expected to directly affect traffic volumes on Research Parkway once completed:

**U-2827B** – I-40 Business, from west of 4th Street to east of Church Street in downtown Winston-Salem (1.1 miles). Project includes repaving the roadway, replacing bridges and improving entrance and exit ramps. Right-of-way acquisition is scheduled for FY 2013 and construction is unfunded for future years beyond 2015.

**U-2826** – US 52, I-40 Bypass to Proposed Western Loop Interchange. Project includes widening and upgrading the roadway and interchanges along 12 miles of US 52, including the segment of US 52 adjacent to the Research Parkway Study Area. Section A (2 bridge replacements over rail) construction is scheduled for FY 2010. Section B is 3.5 miles of roadway widening and upgrades from Stadium Drive, through the I-40B interchange, to Akron Drive northeast of downtown. This project includes removal of the US 52 interchange ramps at Third Street and Fifth Street adjacent to the PTRP Central and North Districts; however, Maple Street (the road connecting the 2 ramps parallel to US 52) would remain. Right-of-way acquisition is scheduled for 2009 and construction is scheduled for FY 2011. The remaining 8.5 miles of U-2826 is currently unfunded for right-of-way and construction.
3.0 ALTERNATIVES ANALYSIS

3.1 No-Build Alternative

The No-Build Alternative would not construct the proposed 0.7-mile, four-lane Research Parkway segment from Stadium Drive to Third Street. It would also not provide the planned extension of the Salem Creek Connector from Stadium Drive north to Linden Street nor provide an important connection envisioned in the Winston-Salem LRTP.

The proposed PTRP development would be oriented toward the existing street system with ingress-egress dictated by building sites. This would produce haphazard driveway entrances and side street intersections with existing streets. Internal trips would have to use the existing street network. The projected traffic volumes of 14,000 to 17,000 vpd for Research Parkway would be disbursed onto the surrounding street network, resulting in bottlenecks and increased congestion. The traffic analysis reviewed the effect of PTRP-generated traffic on the surrounding street network. It was demonstrated that loading the PTRP-generated traffic into the existing network instead of onto Research Parkway will increase traffic volumes on the existing roadways, causing congestion and delays on the nearest parallel street, Salem Avenue. Salem Avenue will be reduced to Level of Service F by 2030.

The local street network as proposed in the Master Plan would provide local transportation facilities through the project site. A No-Build alternative would not address the core purpose and need of providing a transportation corridor through the Study Area that provides needed connectivity through an important part of downtown Winston-Salem. A No-Build scenario also would not have met the City and County goals of re-developing “the area north of Stadium Drive for a mix of uses supporting the research park and educational campus concept” (p. 46 of the South Central Area Plan, as adopted by the City-County Planning Board on 10/24/2002).

3.2 Research Parkway Alternative Alignments

Construction of Research Parkway will focus the PTRP-related development traffic to select controlled points (Stadium Drive and Third Street) that will be designed to accommodate the projected volumes, complete the grid in the north-south direction, and form an important extension of the Salem Creek Connector.

Various alignments were examined for Research Parkway to meet the project purpose of connectivity and access. The width of each alternative corridor is approximately 100 feet and their locations are shown in Figure 6. Natural resource impacts from the various alignments did not vary greatly due to the lack of streams, wetlands, wooded areas, and protected species in the vicinity.

All alternatives have a common grade-separated crossing of I-40B at the existing railroad underpass. This is the only feasible crossing of I-40B, as the rail lines have been moved and consolidated. From Stadium Drive to I-40B, an alignment central to the Study Area is preferred in order to produce a perpendicular crossing of the NS rail line, avoid impacts.
to Bath Branch and connect at Stadium Drive opposite the anticipated northern terminus of the proposed Salem Creek Connector. North of I-40B, western alignments conflict with active rail lines and/or impact a known National Register Historic Site (the Nissen Building).

Two central alignments were given detailed consideration. Alternative 1 parallels the railroad corridor and connects to Third Street 75 feet east of the railroad bridge over Third Street. Alternative 2 bisects the Central District and ties to Third Street at the existing Linden Street intersection.

Other alternatives were considered, including following existing rail corridors or making use of existing streets, but these were found to be less effective at meeting the project purpose and need or were not feasible due to terrain and environmental impacts. Alternative 1 had a northern terminus at Third Street 450 feet west of Linden Street with no continuation to the north of Third Street, which limits the project’s ability to serve the purpose of connectivity and improved access into downtown.

3.3 Preferred Alternative (Alternative 2)

The Alternative 2 Research Parkway alignment allows for connectivity to the Salem Creek Connector at Stadium Drive. This alignment makes use of the existing I-40B overpass between the Central and South District of the Research Park. It also utilizes a rail overpass that is currently under construction, while maintaining a sizable Central District development parcel between the railroad, 3rd Street, US 52 and I-40B. There is ample room (116 acres within the Study Area of Research Parkway) for not only Research Park buildings, but also for providing open space opportunities and greenway/sidewalk access throughout the Research Park. In addition, the project allowed for an opportunity to improve water quality downstream of downtown by integrating new stormwater controls and by improving a portion of Bath Branch. The Site and its surroundings would benefit from this adaptive reuse approach whereas other sites outside of downtown would likely have resulted in a more typical consumptive development project.
4.0 PROPOSED IMPROVEMENTS

4.1 Traffic Projections and Capacity Analysis

Traffic volumes were projected to Design Year 2030 for Build and No-Build scenarios assuming full build-out of the currently vacant land proposed for the Research Park and served by the proposed facility. The build-out scenario was based on maximum density and the currently proposed future land use designation. For the Build Alternative trips were distributed onto the existing roadway network assuming the new Research Parkway link from Stadium Drive to Third Street. The No-Build Alternative assumed the same development scenario but loaded the PTRP-generated traffic onto the existing street network. Additional coordination with NCDOT TIP Project U-2925 regarding traffic projections will occur during Final Design and prior to construction. These traffic projections may be updated to ensure compatibility with the adjacent project.

Capacity analysis was performed to determine needed roadway improvements at the intersections and roadway segments directly affected by the Research Parkway project. Figure 5 shows the existing and design year 2030 traffic volumes on the roadway segments, Figure 7 shows existing Level of Service (LOS) and Figure 8 shows required lanes and resulting LOS in design year 2030. With the proposed additional network link created by Research Parkway, a satisfactory LOS is maintained on the existing street network. In the event that the Design Traffic is updated in the future, the capacity analysis for Research Parkway will be revised to reflect the most current volumes.

Given that the currently vacant land in the Study Area will develop over time, constructing Research Parkway would provide a controlled method of funneling the traffic to defined points and improved intersections to be constructed with this project. Table 2 below compares the annual average daily traffic (AADT) and resulting roadway capacities for the Build and No-Build scenarios.

<table>
<thead>
<tr>
<th>Roadway</th>
<th>Segment</th>
<th>Capacity (vpd)</th>
<th>Build 2030 AADT</th>
<th>Alternative Level of Service</th>
<th>No-Build 2030 AADT</th>
<th>Alternative Level of Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linden Avenue</td>
<td>North of Third Street</td>
<td>26,900*</td>
<td>8400</td>
<td>C or better</td>
<td>7110</td>
<td>C or better</td>
</tr>
<tr>
<td>Third Street</td>
<td>West of Linden Avenue</td>
<td>15,600*</td>
<td>15,090</td>
<td>D</td>
<td>10,480</td>
<td>D</td>
</tr>
<tr>
<td>Research Parkway</td>
<td>Bus I-40 to Third Street</td>
<td>31,100**</td>
<td>17,290</td>
<td>C or better</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Research Parkway</td>
<td>Stadium Drive to Bus I-40</td>
<td>31,100**</td>
<td>14,120</td>
<td>C or better</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Salem Avenue</td>
<td>North of Stadium Drive</td>
<td>12,700*</td>
<td>9150</td>
<td>D</td>
<td>13,940</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>Between Salem Avenue and Future Salem Creek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Connector</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stadium Drive</td>
<td></td>
<td>15,600*</td>
<td>9910</td>
<td>D</td>
<td>11,830</td>
<td>D</td>
</tr>
<tr>
<td>Salem Creek Connector</td>
<td>South of Stadium Drive</td>
<td>31,100**</td>
<td>9420</td>
<td>C or better</td>
<td>8130</td>
<td>C or better</td>
</tr>
</tbody>
</table>

* Capacity based on City of Winston-Salem Thoroughfare Plan tables and LOS D.
** Capacity based on City of Winston-Salem LRTP methodology.
Table 2 reveals that construction of Research Parkway will relieve traffic volumes on streets in the immediate area including Salem Avenue and Stadium Drive while increasing the north-south usage of existing Linden Avenue and proposed Salem Creek Connector. Salem Avenue will be over capacity without the parallel Research Parkway to serve the north-south traffic demand (Note: portions of Salem Avenue south of Stadium Dr. may be reconfigured during the Salem Creek Connector project, but would not increase the capacity of downtown ingress-egress).

Capacity analysis was performed to determine the appropriate number of lanes on Research Parkway. As shown in Table 3, the northern section of Research Parkway from I-40B to Third Street must have a four lane typical section to provide the needed capacity.

### TABLE 3  Research Parkway Lane Requirement Analysis

<table>
<thead>
<tr>
<th>Roadway Type</th>
<th>South of I-40 Business</th>
<th>North of I-40 Business</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>LOS D (AADT)</td>
<td>Level of Service</td>
</tr>
<tr>
<td></td>
<td>2030 AADT</td>
<td>2030 AADT</td>
</tr>
<tr>
<td>Two Lane Undivided</td>
<td>14,600</td>
<td>D (14,600)</td>
</tr>
<tr>
<td>Three Lane (w/TWTL)</td>
<td>15,300</td>
<td>D (15,300)</td>
</tr>
<tr>
<td>Four Lane Undivided</td>
<td>23,300</td>
<td>C or better</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(23,300)</td>
</tr>
<tr>
<td>Four Lane Divided</td>
<td>31,100</td>
<td>C or better</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(31,100)</td>
</tr>
</tbody>
</table>

* Capacity based on City of Winston-Salem LRTP methodology.

South of I-40B a lesser typical section will suffice. However, there are additional considerations for determining the needed lanes such as continuity with proposed lanes on Salem Creek Connector to the south and Research Parkway north of I-40B, as described further in Section 4.2.

### 4.2 Roadway Typical Section

The proposed Parkway (Figure 9) would be constructed as a four-lane urban roadway. North of I-40 Business the roadway would be divided with a 24-foot median, 11-foot travel lanes, 8-foot parking lane, 5-foot planting strip, and 5-foot sidewalk. South of I-40B the roadway would be undivided with 12-foot travel lanes, 2.5-foot curb and gutter, and 5-foot sidewalks setback from the roadway with 8-foot planting strips (a/k/a street yard) (Figure 10). An undivided section was selected south of I-40B because the narrower section fits the existing bridge widths, both at the railroad overpass and under I-40B. PTRP will donate the required Right of Way to the City of Winston-Salem upon completion of construction and acceptance of the roadway by the City.

In the 1400-foot segment from the approach to Stadium Drive to I-40B, a four lane divided section is not demanded by the proposed Design Year traffic volumes. A four lane section is proposed to provide continuity with Salem Creek Connector to the south and Research Parkway to the north. Dropping to a three lane or two lane cross section for this short distance will force merges in an area of significant horizontal and vertical...
curvature, not accommodate driveway and side street connections and cause certain turning movements off of the roadway to impede traffic flow. For continuity and safety reasons, it was concluded that four lanes are the most viable section in this short segment of roadway.

4.3 Functional Classification
The proposed project would carry a functional classification of Urban Local Road.

4.4 Independent Utility and Logical Termini
The proposed project would be a valuable independent roadway and meet its purpose and need by providing connectivity and Research Park access regardless of whether other proposed projects in the vicinity are constructed. Its northern terminus at Linden Street would function as a viable transition between the Research Park and the Goler/Depot Street community of northeastern downtown. The southern terminus at Stadium Drive would provide adequate access and connectivity to the existing street network as well.

4.5 Right-of-Way and Access Control
An approximate right-of-way width of 80 to 95 feet is proposed for Research Parkway (Figure 10). This is currently PTRP-owned land but would be deeded to the City of Winston-Salem upon acceptance of the roadway by the City. Partial control of access is recommended, with primary access being for parking lot driveways.

4.6 Speed Limit
The proposed Parkway would likely be signed with a speed limit of 25 miles per hour (MPH).

4.7 Design Speed
The proposed design speed is 30 MPH, which is consistent with the functional classification.

4.8 Anticipated Design Exceptions
No design exceptions are anticipated for this project.

4.9 Intersections/Interchanges
The proposed roadway intersections would be at-grade. Signalization may eventually be needed at Research Parkway/Stadium Drive and Research Parkway/Third Street as the area builds out.

4.10 Service Roads
No service roads are planned or needed for this project. With the build-out of the Research Park buildings, the proposed short connecting streets within the Central District will serve the remainder of the development area. The majority of the buildings in the northern half of the South District will also be accessed from Salem Avenue or Stadium Drive.
4.11 Railroad Crossings

Research Parkway would have a grade-separated underpass of a Norfolk Southern double-track rail bridge, with a vertical clearance of 15.5 feet. Approximately 8-10 freight trains travel this section of rail daily. PTRP and their engineering consultants have coordinated at length with Norfolk Southern regarding this rail overpass, which is currently under construction under the aforementioned rail improvements.

4.12 Structures

Table 2 below presents the proposed structures in the Parkway corridor. The NS rail bridge is being built under a different project (mentioned previously in this report, documented under a previous Categorical Exclusion), and should be completed prior to Research Parkway’s construction. The stream channel that becomes Bath Branch lies within an existing culvert throughout the Central District and will be relocated in a new 9’x7’ box culvert as part of the stormwater improvements by the City.

<table>
<thead>
<tr>
<th>Structure Feature</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bath Branch drainage channel</td>
<td>Single 9 ft x 7 ft reinforced concrete box culvert</td>
</tr>
<tr>
<td>NS Rail Line</td>
<td>Double-track (one existing, one future) bridge; 41 ft. wide, 120 ft. span length, skewed 20 degrees, founded on vertical concrete abutments; 15.5 ft. vertical clearance for roadway, 40 ft. minimum horizontal clearance from roadway centerline</td>
</tr>
</tbody>
</table>

4.13 Bicycle and Pedestrian Facilities

The new facility would provide sidewalks on both sides of the Parkway for pedestrian passage between the two Districts, in addition to providing a new pedestrian corridor into downtown. Bicyclists would be accommodated by a system of greenways around the perimeter of the Park which will connect to the Salem Creek Trail on the south and Third Street on the north.

4.14 Utilities

There are a large number of utility relocations and improvements that would need to be coordinated with the construction of Research Parkway. Existing water, sewer, gas, electric, and telecommunication lines would need to be relocated and/or consolidated appropriately, and many of these lines are old and/or in poor condition. The utility work is not being funded with the SAFETEA-LU earmark funds, but with other grants and private funding sources through PTRP and the City.

4.15 Stormwater

Considerable stormwater improvements are proposed as part of the Research Park’s development. Within the Central District, stormwater for Research Parkway would be routed to a proposed stormwater pond near the southeastern corner of the District, which discharges to the Bath Branch culvert just north of I-40B. Bath Branch is within an existing culvert throughout the Central District, and this culvert will be re-routed in a new
9’x7’ box culvert to the stormwater pond. These stormwater improvements have already received a Section 404 Nationwide 27/33/43 Permit from the USACE (dated July 31, 2007) and the corresponding 401 Water Quality Certifications from DWQ (dated September 25, 2007). The culvert relocation and stormwater pond will affect 1971 feet of piped intermittent stream and 50 feet of open intermittent stream channel. The section of Research Parkway south of I-40B would have its stormwater routed via curb and gutter to an interim stormwater pond; ultimately, this stormwater would be directed to ponds near Salem Creek in the southern portion of the South District after those permanent stormwater facilities are constructed.

Ultimately, Bath Branch is also proposed for channel improvements (channel stabilization and restoration) from the culvert outlet downstream of I-40B to Salem Creek. The stormwater and stream improvements are being funded through a CWMTF grant and supplemented by funding from the City and PTRP. The stormwater improvements within the Study Area (those that fall north of Stadium Drive and south of Third Street) are included as part of this project, as they are required to treat the stormwater from Research Parkway.

4.16 Construction Phasing

The utility, stormwater and roadway construction will need to be closely coordinated to accommodate utility relocations, continuity of service for utility customers, suitable site drainage, and proper sediment and erosion control. Based on the current TIP projections, it is not likely that the adjacent Salem Creek Connector will be under construction prior to completion of the Research Parkway. No substantial existing traffic patterns would be affected.
5.0 PROBABLE ENVIRONMENTAL EFFECTS & MITIGATIVE MEASURES

This section is to document both the direct, secondary and cumulative environmental effects of the proposed project. The secondary and cumulative effects are addressed at the end of each sub-section and summarized in sub-section 5.16.

5.1 Land Use

The Research Park sits on the eastern edge of downtown adjacent to the interchange of I-40B and US 52, which is a major highway interchange in Winston-Salem. The current land use is a mixture of active/former rail, commercial and industrial operations (Figures 1 and 4). The vast majority of the Site has been altered to accommodate rail and other industrial uses of the past. Most of the parcels have been graded to flat or gently sloping topography, with steep slopes near the few drainage features. Many of the former buildings have been demolished and removed in recent years, while a few one-story commercial steel-frame buildings remain north of I-40B. The existing zoning on-site is General Industrial, Central Industrial, and Limited Industrial. Due to the site’s historical uses and known contamination concerns, PTRP is finalizing a Brownfields Agreement with the State’s Brownfields Program (Appendix C) to address this potential pollution source.

The overall use of the Research Park property will change from scattered industrial and commercial uses to a more intensive research- and education-oriented industrial use, with a consolidated zoning of Central Industrial. This is in accordance with City/County planning documents and in general accordance with the existing zoning of the properties, as Central Industrial allows for some mixed-use development that Limited and General Industrial do not. Land uses included in the Research Park’s master plan have been determined by community input and reflect WFUHS/PTRP needs.

The proposed Research Parkway alignment would be in conformance with local land use plans, transportation plans (such as the LRTP and the three adjacent TIP projects), and the Legacy Development Guide (City-County Planning Board 2001). All of the available planning documents include support for the Research Park, downtown re-development, and at a minimum the general need for a roadway along the proposed Research Parkway corridor.

The properties in the general vicinity of the Study Area are zoned as institutional & mixed use, commercial, and residential. While selective re-zoning is planned for the Research Park itself, which may include allowing mixed-use type residential development, it is not anticipated that the surrounding land uses would be negatively affected as a result of the proposed project.

To mitigate the effects of the more intensive use of this site, stormwater controls are to be implemented that meet or exceed the City’s stormwater requirements. Much of the stormwater to be stored in the Central District’s pond comes from off-site, which is originating on existing downtown impervious surfaces that are not subject to stormwater
controls. The watershed for this stormwater pond totals more than 340 acres, which includes more than one-third of downtown.

5.2 Topography & Floodplains

The Site lies within the Piedmont Physiographic Province, which is characterized by rolling hills and wide floodplains. The topography of the Study Area is an urbanized rolling landscape. It has been altered by filling and grading activities over its long history of commercial and industrial use. The highest point within the Study Area is approximately 915 feet AMSL along the western edge, adjacent to downtown. The lowest elevation is approximately 795 feet AMSL where Bath Branch passes under Stadium Drive, at the southern edge of the Study Area.

The Study Area contains Federal Emergency Management Agency (FEMA)-designated 100-year floodplains along Bath Branch (a/k/a Cloverleaf Branch on Figure 11 below). Along the Bath Branch valley, a small area of the floodplain upstream of the culvert inlet and north of I-40B is designated as Zone AE (100-year flood with base flood elevations determined). Between the outlet of the Bath Branch culvert and its confluence with Salem Creek (and along Salem Creek), the floodplain is designated as a mix of Zone AE floodway, Zone AE (100-year flood with base elevations determined), and unshaded X. These data are based on the Flood Insurance Rate Maps numbered 3710683500J, with an effective date of January 2, 2009 (see Figure 11 below). Research Parkway would not affect the regulated floodplain.

Site topography is anticipated to change slightly to allow for a terracing of the building and parking pads. Although no development is planned within a designated floodplain in the site vicinity, secondary re-development may be stimulated due to the proposed

Figure 11 – FEMA FIRM Mapping (Panel 6835J, dated January 2, 2009)
project. Any such secondary development would result in minimal floodplain impacts, however, due to the governance of existing State and local regulations with regard to floodplain, stormwater and building code requirements. It is not anticipated that development directly or indirectly linked to this project would be allowed to occur within the regulated floodplain.

5.3 Streams & Wetlands

The only stream located within the Study Area is Bath Branch (also known locally as Cloverleaf Branch). It is shown on the Winston-Salem East U.S. Geological Survey (USGS) 7.5-Minute Topographic Quadrangle as a 1st order perennial stream. Much of northeastern downtown drains to Bath Branch, making it a very dynamic stream with very little baseflow and fast-rising high flows during rain events. The majority of Bath Branch on-site flows through a culvert from 3rd Street to south of I-40B and the rail lines (except for a very short section that is daylighted just north of the inlet to the I-40B culvert). The culvert outlets just south of the railroad tracks south of I-40B, then the stream passes under Stadium Drive before it flows into Salem Creek. Based on National Wetlands Inventory mapping and field reconnaissance, there are no known wetlands within the Study Area.

Bath Branch is not a named stream on USGS topographic mapping, so it is officially an unnamed tributary to Salem Creek. Salem Creek falls within DWQ’s 03-07-04 subbasin of the Yadkin River Basin and is deemed a class C water by the State with an index number of 12-94-12-(4). It is listed on the 303(d) list by the State as having impaired biological integrity (for aquatic life) due to urban runoff/storm sewers in addition to having an overall standard violation for fecal coliform.

It is anticipated that there would be a positive net effect on streams and wetlands due to this project. The City’s stormwater improvements will store and treat runoff on-site that currently is passing through the Study Area from downtown and degrading downstream waters. In addition, stream restoration is proposed on a reach of Bath Branch that currently is very degraded due to prior development activities and lack of riparian vegetation. No wetlands or streams are proposed to be negatively impacted by the project, and the project is likely to have a net positive effect on downstream waters and potentially may help address Salem Creek’s listing as a 303(d) impaired water.

In accordance with the Clean Water Act and State stream/wetland permitting requirements, any development that may occur as an indirect result of this project would be required to avoid, minimize, and mitigate for stream and wetland impacts. The stormwater runoff from these secondary and cumulative impacts may increase sediment loading, nutrient enrichment, and surface water pollutants that could impact aquatic and amphibious organisms inhabiting jurisdictional waters. However, these impacts would be minimized by federal/state regulations on jurisdictional waters and state and local stormwater requirements (Appendix F), and the stormwater controls and stream stabilization implemented as part of the Research Park will aide in mitigating the effects of future development in the vicinity.
5.4 Flora & Fauna

Site visits were made to determine the existing vegetative resources in the Study Area. There are only small pockets of natural communities present on-site. The vast majority of the Study Area is either developed or under vegetation management practices (mowing, bush-hogging, herbicide spraying, etc.). As is typical in a heavily impacted urban environment, invasive species are prevalent throughout the site.

Small areas of regenerating Dry Oak-Hickory Forest are the only semi-intact natural communities. They are dominated by maturing (~25-35 year-old) short-leaf pine (*Pinus echinata*), scrub pine (*Pinus virginiana*), white oak (*Quercus alba*), southern red oak (*Quercus falcata*), red maple (*Acer rubrum*) and other immature to maturing tree species on the higher slopes. As it grades toward Bath Branch, box elder (*Acer negundo*) and sycamore (*Platanus occidentalis*) become dominant. The unmaintained vegetated areas north of Stadium Drive and south of the rail line have populations of invasive species, including privet (*Ligustrum* sp.), tree of heaven (*Ailanthus altissima*), mimosa (*Albizia julibrissin*), and kudzu (*Pueraria lobata*). Very few trees are mature, as this area appears to have been cleared in the last 40 years. Several 5-acre areas exist on-site that are completely dominated by kudzu (a non-native invasive that will likely be removed).

Site visits were made to determine the presence of wildlife and wildlife habitat in the area. The following description of wildlife resources is based on field observations and existing literature (Lee et al., 1982 and Webster et al., 1985).

There was little on-site evidence of wildlife, likely due to the general lack of habitat available. Typical wildlife found in the limited amount of forest habitat would generally include the opossum (*Didelphis virginiana*), short-tailed shrew (*Blarina brevicauda*), Eastern mole (*Scalopus aquaticus*), Eastern cottontail (*Sylvilagus floridanus*), Eastern chipmunk (*Tamias striatus*), gray squirrel (*Sciurus carolinensis*), white-footed mouse (*Peromyscus leucopus*), striped skunk (*Mephitis mephitis*), and a variety of birds.

The disturbed habitats on-site would potentially supply habitat for the Southeastern shrew (*Sorex longirostris*), Eastern mole, Eastern cottontail, woodchuck (*Marmota monax*), old-field mouse (*Peromyscus polionotus*), cotton rat (*Sigmodon hispidus*), pine vole (*Microtus pennsylvanicus*), Eastern harvest mouse (*Reithrodontomys humulis*), red fox (*Vulpes fulva*), white-tailed deer (*Odocoileus virginianus*), and various avian species.

Portions of forested land within the Study Area may be converted to other uses; however, forest resources are likely to remain where feasible, such as along the stream channels and adjacent floodplains, as well as along the perimeter of the site near the rail lines and roads. The Research Park will use a natural setting to the maximum extent practical, which will involve “urban forestry” practices to provide some native-type landscaping and natural flora. It is likely that some exotic/invasive species controls would be required as part of the landscape plan. Open space objectives are a major component of the mixed-use approach to this Research Park, which would allow any existing migration of wildlife to continue from one area to another, while limiting exposure to human infrastructure.
5.5 Protected Species

Under the provisions of the Endangered Species Act (ESA) of 1973 as amended, any action likely to adversely affect a species classified as federally protected is subject to review by the United States Fish and Wildlife Service (USFWS). Plants and animals with Federal classifications of Threatened or Endangered are protected under the provisions of Sections 7 and 9 of the ESA. Federal Species of Concern (FSC) are also a priority of the USFWS but are not protected under the ESA. Species listed as Endangered or Threatened by the State (North Carolina Natural Heritage Program) are afforded limited State protection under the North Carolina State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979.

The North Carolina Natural Heritage Program (NCNHP) and the USFWS databases were reviewed for known occurrences of protected species in Forsyth County (Table 1). There are two federally Endangered species found in the county, red-cockaded woodpecker (*Picoides borealis*) and small-anthered bittercress (*Cardamine micranthera*); one federally Threatened due to similarity of appearance, bog turtle (*Clemmys muhlenbergii*); and one federal species of concern, brook floater (*Alasmidonta varicosa*), which is not afforded the same protections as threatened and endangered species.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Common Name</th>
<th>State Status</th>
<th>Federal Status</th>
<th>County Status</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Picoides borealis</em></td>
<td>Red-cockaded woodpecker</td>
<td>E</td>
<td>E</td>
<td>Historic</td>
</tr>
<tr>
<td><em>Clemmys muhlenbergii</em></td>
<td>Bog turtle</td>
<td>T</td>
<td>T (S/A)</td>
<td>Current</td>
</tr>
<tr>
<td><em>Cardamine micranthera</em></td>
<td>Small-anthered bittercress</td>
<td>E</td>
<td>E</td>
<td>Historic</td>
</tr>
<tr>
<td><em>Alasmidonta varicosa</em></td>
<td>Brook floater</td>
<td>E</td>
<td>FSC</td>
<td>Obscure</td>
</tr>
</tbody>
</table>

The red-cockaded woodpecker is endangered, but has not been recorded in the county for at least 20 years. The remainder of the range for this species is generally south and east of Forsyth County in the Coastal Plain and Sandhills regions of North Carolina. This species inhabits mature pine forests (usually 80 to 120 years old), which are not present in the vicinity of the Study Area.

The bog turtle is easily distinguished from other turtles by the large, conspicuous bright orange, yellow or red blotch found on each side of the head. Adult bog turtle shells are 3 to 4-1/2 inches in length and range in color from light brown to ebony. The southern bog turtle population is separated from the northern population by approximately 250 miles. However, individual bog turtles in the southern population closely resemble individuals in the northern bog turtle population, causing difficulty in enforcing prohibitions protecting the northern population. Therefore, the USFWS has designated the southern population as "threatened (similarity of appearance)." This designation prohibits collecting individual turtles from this population and bans interstate and international commercial trade. It has no effect on land management activities of private landowners in southern states where the bog turtle lives.
Small-anthered bittercress is a plant in the mustard family. It is 8 to 16 inches in height with white flowers containing 0.02-inch long (nearly round) anthers and ~0.06-inch wide petals. It is present in Forsyth and Stokes Counties in the Dan River watershed. It occurs along small streams on sandbars, streambanks, seepages, wet rock crevices, and within floodplain depressions.

Brook floater is a freshwater mussel characterized by a small, thin, rhomboid-shaped shell. It occurs in medium- and larger-sized streams and rivers in the Atlantic Slope river basins. It prefers clean, swift-moving water with stable sand/gravel or gravel substrate. It is known near the far northwestern corner of Forsyth County in the Yadkin River (NCWRC 2007).

The site vicinity is a primarily urban setting and relatively unnatural. The likelihood of any of the four federally-protected species occurring on-site is extremely low, as all four species (red-cockaded woodpecker, bog turtle, small-anthered bittercress, and brook floater) require habitat that is unavailable on-site. The proposed project is anticipated to have “No Effect” on these four species.

While secondary land use changes may occur as a result of this project, the project is not anticipated to have an indirect effect on federally-protected species.

5.6 Geology, Groundwater & Brownfields

The local geology is described as inequigranular and megacrystic Biotite gneiss and schist with abundant potassic feldspar and garnet. It is interlayered and gradational with calc-silicate rock, sillimanite-mica schist, mica schist, and amphibolite. It also contains small masses of granitic rock (NCGS 1985). Groundwater in the vicinity is generally found in the unconsolidated sediments and within fractures in the underlying bedrock. The typical water table is found in the saprolite layer. Groundwater flow is generally from high to low elevations, and the water table tends to be a subdued reflection of topography. Recharge occurs in upland areas where pervious surfaces are available, and perennial streams and compromised underground pipes tend to be discharge points.

A general increase in impervious surfaces may impede groundwater recharge and groundwater’s ability to maintain base flow during drought conditions; however, stormwater controls and open space areas will help to mitigate these effects.

As noted earlier in this document, the Parkway and its surrounding property is to be developed through the use of a brownfields agreement, wherein the developer’s environmental cleanup risk is minimized in order to allow the re-development of an underutilized property while avoiding risks to public health. A Brownfields Letter of Intent was submitted to Mr. Bruce Nicholson of the DENR Division of Waste Management on April 26, 2005 by Ms. Lori Hinnant of Womble Carlyle Sandridge & Rice (Appendix C). The submittal was prepared on behalf of the prospective developer, PTRP.
With PTRP having conducted a series of Phase I environmental site assessments and Phase II assessments of certain properties, the Letter of Intent documents the following threats or potential threats of environmental contamination brought about by “current and historic operations” within the Study Area and adjacent parcels:

- Parcels within the development area are located within an area of historical commercial and industrial use including railroad systems, a manufactured gas plant, dry cleaning operations, cigarette manufacturing, a concrete batch plant, a furniture company, and a foundry operation.
- Known soil and groundwater contamination exists on parcels within the development area and on parcels at adjacent or nearby sites including PAHs, volatile organics, semi-volatile organics, and metals.
- Presence of above ground storage tanks (ASTs), other above ground process tanks and chemical underground storage tanks (USTs) related to the cigarette manufacturing processes.
- Presence of ASTs and USTs related to petroleum products and bulk fuel storage including multiple parcels containing a UST identified as a “leaking UST” and others showing signs of soil staining.
- Presence of used oil drums and visible soil staining.
- Presence of oil/water separators.
- Presence of chemical and lubricating oil storage and evidence of hydraulic oil staining resulting from the cigarette manufacturing process.
- Historical use and presence of chemical storage supporting maintenance or machine shop activities related to manufacturing facilities.
- Historical storage and handling of hazardous materials (paints and paint thinners, plating solutions, asbestos containing material, waste treatment sludge, used oil, lead-acid batteries, etc.) on parcels within the development area.
- Presence of mercury containing devices, historical chemical use and storage of coal related to power generation and presence of an electrical substation.
- Parcels listed in the LUST database and sites covered by an Assessment and Remediation Administrative Order within the development area.
- Presence of construction and demolition debris of unknown composition on a multiple parcels.
- Presence of fill material of unknown composition on at least one parcel.
- Possible lead, chromium, nickel, iron, and inorganic contamination related to the foundry operation.
- Presence of debris and landfill materials of unknown quantity and composition.

In correspondence dated June 3, 2005, the NC Division of Waste Management determined the “PTRP project is eligible for entry into the brownfields program and for continued evaluation for a brownfields agreement…”. More recent correspondence, dated September 5, 2008, expands upon the agreement being negotiated and is attached in Appendix C.
PTRP will continue to coordinate with the Division of Waste Management staff in relation to this matter. PTRP is committed to working with the City, County, and State to remediate contamination and improve the overall soil and groundwater quality in the Study Area and its vicinity.

5.7 Soils

The majority of the soils within the Study Area have been disturbed by prior land-disturbing activities. The “Cut and Fill Land” and “Pacolet Urban Land Complex” mapped soils are the dominant soils in the Study Area, according to the Soil Survey of Forsyth County (USDA 1976). Brief descriptions of the soil types follow.

Cut and Fill Land (Cu) “consist of areas that have been so altered by man that the original soil profile and topography are not recognizable. Slopes generally are less than 4 percent, but are steep on one or more sides.” (USDA 2007)

The Pacolet Urban land complex (Pu) “consists of areas where Pacolet soils have been altered in many places by the construction of buildings, streets, and parking lots and other urban development.” (USDA 2007)

Any impacts to soils on-site will be minimized through state and local sediment and erosion control requirements and through existing processes such as the site plan approval process required prior to ground disturbing activity. No undisturbed native soils appear to be present on-site.

5.8 Prime or Unique Agricultural Lands

The land within the Study Area has been altered by over 100 years of development and land-disturbing activities. The soils on-site are no longer in a natural state and are not suitable for agricultural uses.

There are no anticipated direct or indirect impacts to prime or unique agricultural lands due to this project.

5.9 Public Lands and Scenic, Recreational, and State Natural Areas

No City, County, State, or Federal scenic/recreational/natural areas exist within the Study Area. The Research Park would provide for passive pedestrian-type uses (walking, jogging, biking, etc.) via a system of paths, greenways and sidewalks. The proposed stream restoration and the stormwater improvements will ultimately be controlled by the City, but they will be readily observable by the public via the proposed greenways. Ultimately, the PTRP Master Plan would establish more than 40 acres of open/green space within the Research Park (PTRP 2008).

Growth in the site vicinity should have limited impact on scenic and recreational areas as most are already protected by local governmental or non-profit foundations (Old Salem, local parks, etc.). Open spaces are becoming more valued by the community, and Winston-Salem has addressed this issue by producing planning documents for parks,
greenways, and other open space that have been endorsed by the City-County Planning Board (e.g., the Draft City/County Parks and Open Space Plan, dated February 2006).

5.10 Historic & Cultural Resources

The Wake Forest University (WFU) Archaeology Lab conducted archaeological and historical investigations for the Central and South Districts (Robinson and Hartz 2008, Robinson et al. 2008). They identified a number of historic resources within the Area of Potential Effects (APE), including the S.J. Nissen Wagon Repair Shops building on Third Street (on the National Register of Historic Places) and the relic C.M. Thomas coal trestle that is eligible for listing on the National Register (Robinson et al. 2008). Eligibility and Effects determinations have been made for these resources, and the C.M. Thomas coal trestle was the only resource to result in an Adverse Effect (Figure 4).

The adverse effect is created by indirect effects from development that can be expected to occur as a result of the Research Parkway construction. It is apparent that the coal trestle will have to be demolished to accommodate the grading requirements of the proposed buildings and development within this portion of the Research Park. There is no use of the coal trestle site as a direct result of this project, so it was determined by FHWA that Section 4(f) did not apply.

Two potential archaeological resources may be present near the Research Parkway alignment, but neither is expected to be directly affected by the project (Robinson and Hartz 2008). NCDOT and WFU Archaeology staff have coordinated with HPO and OSA to verified (via HPO documentation dated July 10, 2009) there is no need for further archaeological investigation prior to construction.

P PTRP is committed to continuing to work with HPO/OSA and local regulatory contacts to provide all required documentation to meet the requirements of Section 106 of the National Historic Preservation Act, the Advisory Council on Historic Preservation’s Regulations for Compliance with Section 106 codified at 36 CFR Part 800, and Section 4(f) of the U.S. Department of Transportation Act of 1966.

The indirect impact of the destruction of the historic coal trestle cannot be avoided due to the need to raise the grade of the surrounding roadways and building sites in order to provide flood clearances when the land served by Research Parkway is developed. The existing drainage features through the Central District will be controlled to provide stormwater storage and treatment. The flood elevations are controlled by the culvert under I-40, which in turn sets the pool elevation affecting the building sites and roadways (Figure 9).

The profile of Research Parkway is set by I-40B and the adjacent railroad. The building sites and roadways are “stepped” or terraced from the lowest elevation allowed by clearance above flood levels up to the elevation of Research Parkway. The result is that the trestle site is approximately 20 feet below grade and would be in a “hole” of sorts if the site were to be retained. An MOA between FHWA and HPO addressing this Adverse Effect was signed and later filed with the ACHP on October 28, 2009.
5.11 Air Quality

The Triad Area was part of an Early Action Compact (EAC). The EAC Ozone Action Plan was developed in 2004 to try and get the area into attainment status by December 2007. The EPA recently announced that the Triad area is now in attainment with the 8-hour ozone National Ambient Air Quality Standard based on quality-assured data.

For each alternative in this EA, the amount of Mobile Source Air Toxics (MSATs) emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the build alternatives is slightly higher than that for the no-build alternative, because Research Parkway facilitates new development that attracts trips that were not occurring in this area before. This increase in VMT means MSATs under the build alternatives would probably be higher than the no-build alternative in the Study Area. There could also be localized differences in MSATs from indirect effects of the project such as associated access traffic, emissions of evaporative MSATs (e.g., benzene) from parked cars, and emissions of diesel particulate matter from delivery trucks. On a regional scale, this emissions increase would be offset somewhat by reduced travel to other destinations.

It is expected there would be no appreciable difference in overall MSAT emissions among the various build alternatives. For all alternatives, emissions are virtually certain to be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 percent from 2000 to 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the Study Area are likely to be lower in the future than they are today.

If and when other adjacent roadway projects (Salem Creek Connector, US 52 improvements) are constructed, they may have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs would be higher under certain alternatives than others. However, as discussed above, the magnitude and the duration of these potential increases cannot be accurately quantified because of limitations on modeling techniques. Further, under all alternatives, overall future MSATs are expected to be substantially lower than today due to implementation of EPA's vehicle and fuel regulations.

In summary, under all the build alternatives it is expected there would be slightly higher MSAT emissions in the Study Area, relative to the no-build alternative, due to increased VMT. There could be slightly elevated but unquantifiable changes in MSATs to residents and others in a few localized areas where VMT increases, which may be important particularly to any members of sensitive populations. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.
The project is located in Forsyth County, which is within the Winston-Salem nonattainment area for carbon monoxide (CO) as defined by the EPA. The 1990 Clean Air Act Amendments (CAAA) designated this area as moderate nonattainment area for CO. However, due to improved monitoring data, this area was redesignated as maintenance 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 Metropolitan Planning Organization (MPO) 2035 Long Range Transportation Plan (LRTP), the High Point MPO 2035 LRTP and the 2009-2015 Transportation Improvement Programs (TIPs) conform to the intent of the SIP. The USDOT made a conformity determination on the Winston-Salem MPO LRTP on 3/6/09, the High Point MPO LRTP on 3/6/09, the Winston Salem MPO TIP on 3/6/09 and the High Point MPO TIP on 3/6/09. 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.

An air quality analysis (HDR 2009) was performed to estimate the maximum one-hour carbon monoxide (CO) concentrations caused by vehicular traffic along the proposed alignment. The local, micro-scale CO concentrations were estimated using the USEPA’s line source dispersion model CAL3QHC, with input from the USEPA’s emission factor model MOBILE6. The model results were added to the background concentration to determine the total 1-hour and 8-hour CO concentrations at a receiver near a roadway. These total values were then compared to the NAAQS to determine whether the receiver would experience air quality impacts. The worst-case air quality scenario was determined to be in the vicinity of the intersection of the proposed roadway and Stadium Drive, based on traffic congestion analysis. CO vehicle emission factors were calculated for the years 2010, 2015, and 2030 using MOBILE6 and the traffic volumes are based on the annual ADT projections.

Comparison of the predicted CO concentrations with the NAAQS (maximum permitted for 1-hour averaging period = 35 ppm; 8-hour averaging period = 9 ppm) indicates no violation of these standards. Since the results of the worst-case 1-hour CO analysis for the Preferred Alternative is less than 9 ppm, it can be concluded that the 8-hour CO level does not exceed the standard.

The Air Quality Analysis Report for the project (dated May 7, 2009) includes additional information and further details on the CO hotspot analysis and MSATs.

5.12 Noise

The existing sources of noise pollution around the Study Area include traffic along the nearby roadways and other day-to-day noise representative of the industrial, commercial, and high-density residential land uses in the immediate vicinity. Noise levels in and around the Study Area are dominated by I-40B, US 52, and intermittent industrial noise from R.J. Reynolds Tobacco to the north. The existing sources of noise pollution include those typical of moderate sized cities.
The nearest potential business receptor is located approximately 200 feet west of the northern terminus of Research Parkway, and the nearest potential residential receptor is more than 850 feet west of the southern terminus. Based on the FHWA Traffic Noise Model (TNM) LookUp Data, in combination with the 2030 Traffic Analysis for the project, it is not anticipated that the project would have an affect on the amount of noise in the immediate vicinity. The projected traffic increases due to the Research Park should not significantly increase noise impacts to the closest receptors (<2 dBA increase over projected no-build).

5.13 Utilities

Utilities have been previously addressed in the PTRP Master Plan prepared by Sasaki Associates, as follows:

“The City of Winston-Salem Engineering Department advises that the water lines within the Study Area are 100 years old but are in good condition. There is enough capacity within the system to support new development. Booster pumps for fire protection may be necessary, depending on the height of new buildings.

“The sanitary sewer system consists of vitrified clay material, ranging in diameter from 6 to 18 inches. The main trunk line runs north to south from 7th Street along Liberty Street and through the City Yard, where it collects in a 42-inch interceptor pipe along the [Salem] Creek. The capacity of the existing lines is not known at this time and needs to be analyzed once a development program is established.” (Sasaki 2003)

As the capacity needs are unknown at this time, it will be the responsibility of the City/County Utilities and Planning Departments to work with PTRP to address wastewater line and treatment capacity.

Most utilities have indicated that current infrastructure is already in place to support the proposed improvements. PTRP will work with the City to determine if any improvements need to be made to the existing municipal sewer lines in and around the Research Park property.

PTRP proposes to control entry and excess digging by commercial telecom providers by providing fiber optics via a 'carrier hotel' within the Research Park. Tenants will be able to access all major providers, but the providers will have to rent the fiber optic usage from PTRP. All providers will be available to tenants and the development of the Project will not mandate that any providers amend/increase what is available currently in the project area. In summary all services would be available, new development would not create a shortage or force additional growth by providers, and PTRP will control the excess digging for tie access lines to all the facilities since PTRP will own all of the fiber optic cable.
5.14 Community/Social Effects (including Environmental Justice)

Research Parkway would help the Research Park serve as a bridge to link together the center of the city and residents who live east of downtown. The completed street network would improve the connection between nearby residential areas and employment centers. The majority of the surrounding neighborhoods are either minority or low-income populations, or both. PTRP has worked with the City to avoid any adverse impacts to minority or low-income populations, and input from various stakeholder groups has indicated that only positive effects are anticipated. In addition, by utilizing the Brownfields Program, the Research Park will help support cleaning up contaminated land that has been vacant or underutilized for many years. This part of downtown was once a thriving center of commerce, and the development of the Research Park has the ability to restore this status.

The Research Park will provide new job opportunities for existing community residents and for future graduates from nearby universities. PTRP is working with Winston-Salem State University, a historically-black public university, to incorporate their needs into the planning of the education-oriented South District, which is within 200 yards of their main campus.

The project avoids displacing any residences, while only displacing a few active businesses who lease space from PTRP (PTRP owns all of the existing buildings within the Study Area). Additionally, the local neighborhoods in East Winston and the Goler/Depot Street area should see a net benefit as employment opportunities are created.

Downstream waters along Salem Creek will benefit from the proposed stormwater improvements within the Research Park. Downstream water quality will likely be enhanced and flooding risks somewhat mitigated by retaining some of the high flows from downtown’s impervious surfaces.

5.15 Hazardous Materials

PTRP is committed to improving the status of the existing soil and groundwater contamination on-site through the Brownfields Program. They plan to educate Research Park users about such efforts and also to try to eliminate any future contamination potential via the same means (see also the Brownfields discussion in Section 5.6).

5.16 Indirect/Cumulative Effects

The Research Park’s three Districts will be zoned and developed for industrial, commercial, educational, and mixed use purposes. The Research Park’s surroundings are mostly developed, which limits the indirect and cumulative effects of the project, although redevelopment of aging commercial and industrial properties is likely in the long term as downtown Winston-Salem continues its revitalization. Winston-Salem has incorporated these potential changes into its land use plans and is encouraging redevelopment, especially mixed-use opportunities that provide new residential dwellings in the downtown area.
Under a No-Build scenario, the Research Park would still likely be built out. The community has made the investment to direct growth toward this area, and significant strides in planning and construction have been taken in this direction. However, if Research Parkway were not built there would likely be stress placed on the existing street system with ingress-egress dictated by individual building sites. This approach would produce haphazard driveway entrances and side street intersections with existing streets. Internal trips would have to use the existing street network. Additionally, it would likely produce a disjointed and potentially less successful build-out of Piedmont Triad Research Park since the Park would lack a connecting street through the railroad / I-40B corridor that divides the site.

A positive effect is anticipated with regards to East Winston neighborhoods and commercial areas, as the urban renewal provided by Research Parkway and the Research Park radiates out into the local economy, helping to replace those jobs in the textile and tobacco sectors. In addition, the US 52 and I-40B safety and traffic improvements slated to occur in coming years have taken into account the future growth of downtown with regard to the Research Park, as well as the future potential to reconnect East Winston and other minority neighborhoods with downtown. The rail consolidation project currently under construction helps accommodate the potential for future light rail service in the Triad, which may help alleviate the cumulative impacts of future growth in the region. The Salem Creek Connector would help alleviate pedestrian safety concerns by diverting some traffic away from the Winston-Salem State University area along Martin Luther King Jr. Drive.
6.0 REQUIRED PERMITS

The permits and authorizations that are likely to be required before the proposed project could be built are described below.

Section 106 MOA
An MOA has been finalized to conclude the Section 106 coordination process for the indirect impact to the C.M. Thomas coal trestle, as well as to set forth the necessary scope of future archaeological and historical investigations. The MOA has been signed by FHWA, PTRP and HPO, and was filed with the ACHP on October 28, 2009. Coordination will continue to ensure full compliance with the MOA stipulations.

404/401 Permit/Certification
Wetlands and surface waters are under the jurisdiction of the USACE through Section 404 of the CWA and DWQ through Section 401 Water Quality Certification of the CWA. Impacts to jurisdictional wetlands and streams are allowable if no practical alternative exists for the project. Unavoidable impacts to streams and wetlands require a permit application to the USACE and DWQ. A 404 permit and a 401 certification have already been issued for the stream restoration and stormwater improvements outlined in this document (see Appendix D). The 404/401 process triggers a regulatory review to determine the potential for any impacts to federally-protected species and cultural resources.

Sediment and Erosion Control Permit
Plans and specifications for the project would be submitted to the North Carolina Division of Land Resources Land Quality Section, or their local delegated authority, prior to land disturbing activities.

Division of Waste Management Brownfields Program
Construction of the Research Park would require ongoing coordination with the Brownfields Program to verify that any soil and groundwater contamination discovered is handled appropriately.

Federal Emergency Management Agency Approval
If any change in floodplain topography is required, a No Rise Certification or Letter of Map Revision would be prepared and submitted to the local floodplain administrator for approval. It is anticipated that this effort would comply with FEMA and local floodplain rules. The City acts as the local floodplain administrator and has been consulted for this project.
7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

7.1 Agency Coordination

Local, state and federal agencies have been consulted about this project. Local officials, including staff of the City’s stormwater, planning, engineering, transportation, and utilities departments have been involved in every step of the decision-making process regarding the Research Park. State officials with the NCDOT, DWQ, Division of Waste Management, Division of Land Resources, Wildlife Resources Commission, State Historic Preservation Office, Office of State Archaeology, Department of Commerce, and other agencies have reviewed various components of the project. Federal agency coordination has included the FHWA and the U.S. Army Corps of Engineers. Comments from the N.C. Wildlife Resources Commission expressed concern regarding stormwater controls. The stormwater facility planned for the Central District should help to mitigate the existing and proposed development within the Bath Branch and Salem Creek watershed. (Appendix E)

7.2 Public Involvement

7.2.1 Public Informational Workshop

A public workshop describing the project was conducted on June 12, 2007 in the One Technology Place building at 200 East First Street in downtown Winston-Salem. Public notice of this meeting was performed via advertisement in two local newspapers (the daily Winston-Salem Journal and the weekly Winston-Salem Chronicle) in addition to placement of calls to key stakeholder leads. The purpose of the meeting was to present the project to the public and allow for any discussion to occur between the public and representatives from the developer, the owner and the engineering consultant. Exhibits, maps, project descriptions and sign-in sheets were at the meeting for use and tracking.

Attendance at this meeting was very small, with one member of the general public attending, six members of City staff and one member of County staff. Typical conversation revolved around traffic and road layout, site development plans and timeline. The member of the public who attended was a local real estate developer who lived nearby; the individual was already well-aware of the project and interested in the latest set of plans. PTRP had previously coordinated with local stakeholder groups and elected officials and thus the interest level was probably somewhat diminished due to previous communications and meetings. In addition, the Research Park has been well-covered by the local media for several years.

7.2.2 Other Stakeholder Involvement

The community has been very involved in planning the Research Park. A stakeholder group (the PTPR Community Advisory Committee) was established in 2002, which includes local religious, business, educational and community leaders. The Committee is very focused on providing jobs for minorities and educating young people about opportunities in the community. Ms. Joycelyn
Johnson, City Council member representing the East Ward, serves as the Committee’s chairperson.

In addition to the Advisory Committee, PTRP hosted Community Engagement Meetings for the North District planning effort and provided a website showing their latest master plans and how to contact the Research Park officials. PTRP has also sponsored the SciTech Summer Technology Institute for up to 50 local rising 8th graders, which seeks to engage underrepresented students in math and science via hands-on exposure in a campus setting with local educators and researchers.
8.0 REFERENCES CITED


