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6.0 TIER 1 ANALYSIS

Three-Tier Process: This study uses a comparative screening analysis technique known as tiering. This screening process, or tiering, allows assembly of a large array of competing criteria in matrix format for evaluation. The key factor in the tier analysis is its ability to sort a large array of complex designs to obtain several viable comprehensive, long-range land use and transportation alternatives suitable for further analysis.

Because the primary purpose of the study is to evaluate improvements to an existing freeway, the Tier I analysis focuses on developing alternative roadway alignments within the current US 52 corridor. Another study has evaluated the feasibility of new alignments to serve north/south through traffic within the Winston-Salem metropolitan area. The findings of that study recommend an eastern and western beltway to serve through traffic. This study begins with the premise that both an eastern and western beltway will be built to serve through traffic. Its purpose is to develop strategies to improve the US 52 Corridor to meet the future transportation demands of traffic travelling to and through the heart of Winston-Salem.

The purpose of the Tier I evaluation is to make a preliminary determination of how well the mainline alignment alternatives meet future mobility needs in the Corridor through the year 2025.

6.1 Background

The Master Plan methodology calls for a three-tiered evaluation starting with a wide range of mainline alignment alternatives and proceeding through increasingly refined screenings, until the one or two of the most viable packages of improvements remain. The range of transportation improvement alternatives evolved from an analysis of existing and future (2025) travel demand and system deficiencies. The alternatives were divided into six segments, each with a varying number of improvement alternatives, depending on the extent of current deficiencies and the degree to which improvements could be incorporated into the surrounding environment. These Tier I alternatives were developed by the consultant team in cooperation with WSDOT.

The Tier I alternatives include a wide range of freeway alignment alternative improvements that could be implemented to address future travel and mobility needs in the corridors. A base scenario, derived from adopted MPO, NCDOT, and local plans and programs, was defined as the “No Build” Alternative. This alternative will be used as the yardstick against which the performance of the other alternatives will be measured.

The evaluation of Tier I alternatives is the heart of the Master Planning process. Eighteen (18) evaluation measures were derived from project goals and objectives for use in the three-tiered evaluation process. Some of the evaluation measures were developed from the results of running the Piedmont Triad Regional Planning Model to test each alternative’s effectiveness in addressing future travel needs. Other measures were calculated from transportation system characteristics and the physical and environmental impacts of each alternative. All eighteen (18) evaluation measures are applied to the Tier 1 process in a qualitative manner. In Tier 2, three of the 18 measures of effectiveness are evaluated quantitatively and the remaining 15 alternatives continue to be qualitatively evaluated. A brief description of the 18 measures used in the Tier I analysis follows.

6.2 Purpose

The Tier I evaluation provides a first-cut analysis of the alternatives and is intended to expose “fatal flaws” and measure the relative performance of the alternatives and their components in achieving Master Plan objectives. The Tier I analysis should cause some alternatives to be dropped from further consideration. It is also likely that the lessons learned from this analysis will result in adjustments to surviving alternatives to improve their performance in the two remaining evaluations.

The results of the Tier I evaluation were reviewed with WSDOT staff during June 2002. Comments from this work session are used to structure both the surviving alternatives and evaluation measures to be used in the Tier 2 analysis. After cycling through Tier 2, the alternative (or combination of alternatives) that emerges from Tier 2 as the most effective in achieving Plan objectives is refined and recommended to WSDOT and the MPO as the preferred Master Plan.

6.3 Alternatives Analyzed

This section provides an overview of the transportation components or “building blocks” that are used to develop the alternatives and a brief description of each of the Tier I alternatives.

6.3.1 Alternative Components

As noted earlier, the plans are structured to emphasize certain alignment alternatives in order to accentuate and better assess their impacts on the overall corridor and system performance. The building blocks for the alternatives are the various types of alignment improvements that are applicable to the travel and mobility needs and problems in the study area. The detailed measures of effectiveness and other respective levels of investment used to evaluate each of six corridor segments include:

Physical Impacts	Environmental Considerations
Horizontal Alignment	Wetlands
Vertical Alignment	Noise
Structures/ Railroad Conflicts	Visual Impacts
Constructability	Air Quality
Traffic and Safety Impacts	Contamination Sites
Safety Improvements	Flood plains
Congestion Relief	Cultural Impacts
Cost Analysis	Historic Sites
Construction Costs	Displacements
Right-of-way Costs	Community Facilities
	Redevelopment Opportunities

The Tier I evaluation was designed to analyze and compare the cumulative effects of the improvements packaged within each alternative. In some cases, total system-wide effects were evaluated, while other evaluation measures focused specifically on the effects on the roadway itself.

6.3.2 Alternative Improvement Packages

The alternative plans were developed for each of six corridor segments, with the number of alternatives evaluated depending on the degree of difficulty in developing an acceptable plan. Running from south to north, the corridor was divided into the following sections:

- Section 1: I-40 to Diggs Boulevard Interchange;
- Section 2: Diggs Boulevard Interchange to Northwest Boulevard;
- Section 3: Northwest Boulevard to Glenn Avenue;
- Section 4: Glenn Avenue to Motor Road;
- Section 5: Motor Road to Oak Summit Road; and
- Section 6: Oak Summit Road to Northern Project Limit.

The number of alternatives ranges from as many as seven for Section 1 (where the horizontal alignment is substandard, right-of-way is limited and the corridor is densely developed) to two for Sections 4 and 5 (where there is ample right-of-way to widen the roadway within the median and no alignment improvement is necessary).

Each segment includes a No Build Alternative to establish a benchmark from which the other alternatives can be measured. The No Build contains roadway improvements in the Winston-Salem Thoroughfare plan but that are not yet built, including the Northern Beltway, Salem Creek Parkway, Martin Luther King, Jr. Drive extension to the west and Motor Road extension to the east. All other improvement plans include the Thoroughfare Plan roadway improvements as well.

A Minimum Design Alternative is also included for each segment. This plan establishes the extent of improvements needed to meet minimum capacity and safety improvements under current 60-mph design standards. US 52 would not be eligible for Interstate designation under this alternative.

Finally, a varying number of design alternatives are developed for each segment, depending on the extent of improvements necessary to meet 70-mph design standards. For instance, Segments 1 and 3 include sections where the horizontal alignment is substandard and new alignments are explored. Alternative alignments were also explored for Section 2 because access to downtown requires that additional right-of-way be acquired to eliminate substandard weaving sections. Because the remaining three sections in the northern part of the corridor essentially have enough right-of-way to be widened within the median area, fewer alternatives were evaluated.

The following is a description of the alternative components for each corridor section followed by a series of figures depicting the alternative plans.

6.3.2.1 Section 1: I-40 to Diggs Boulevard

Because the horizontal alignment on this section of roadway does not meet design standards, six alternative alignments in addition to the No Build Alternative were evaluated. Figure Series 6-1 illustrates the alternatives developed for Section 1.

Alternative 1 No Build: Under the No Build Alternative, no improvement is made to the current substandard horizontal and vertical alignment and interchanges are unchanged. The alignment does not meet current 60 mph freeway design standards nor will it meet 70 mph interstate design standards. The current four-lane cross-section is approaching capacity today and will not meet 2025 traffic demand.

Alternative 1 Minimum: This plan does not meet interstate design standards, improves safety somewhat and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet current 60 mph design speed. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. Widening will be symmetrical along the centerline. The alignment through the reverse curve between Waughtown Street and Mock Street will be upgraded to improve safety at the 60-mph design speed. All of the bridges on US 52 and its cross streets will have to be replaced, including the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street. Vargrave Street will remain in its current location. This alignment will be difficult to construct because all widening will have to occur adjacent to active travel lanes.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek.

With respect to the human environment, the minimum design alternative will take few structures. The symmetrical widening may cause the improvement to encroach on Diggs Elementary School and the Liberia Baptist Church graveyard on the western side of the right-of-way. This plan does not affect the Carolina Steel fabrication plant, a large industrial parcel on the eastern side of Vargrave Street. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the City to gain possession of the park in the near future. This plan offers no potential for redevelopment.

Construction and right-of-way costs will be relatively low compared to the other alternatives because the existing structures and roadway will be used to the greatest extent possible and little additional right-of-way will be needed.

Overall, the minimum design alternative ranks low with respect to the other alternatives, improving travel conditions only and safety slightly, but with the lowest cost.

Alternative 1A: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative upgrades US 52 to meet 70 mph interstate standards by straightening the reverse curve between Waughtown Street and Mock

Street. The alignment will be shifted to the west between I-40 and Vargrave Street and to the east between Vargrave Street and Mock Street. The roadway will be widened to a six-lane freeway to meet 2025 traffic demand. All of the bridges on US 52 and its cross streets will have to be replaced, including the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek.

With respect to the human environment, Alternative 1A will take structures, including the Carolina Steel fabrication plant, a large industrial parcel on the eastern side of Vargrave Street. However, this plan will not affect Diggs Elementary School or the Liberia Baptist Church graveyard on the western side of the right-of-way. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the City to gain possession of the park in the near future. This plan offers some potential for redevelopment in the vicinity of the Carolina Steel plant to the east of US 52.

Construction and right-of-way costs will be relatively high compared to the other alternatives because the plan takes the steel fabricating plant to the east, which could be costly to relocate. Vargrave Street will have to be relocated but could use land taken for the new alignment of US 52. This alignment will be difficult to construct because the new alignment crosses the existing alignment, complicating traffic control during construction.

Overall, Alternative 1A ranks in the middle with respect to the other alternatives, improving travel conditions to meet interstate standards. However, the difficulty of construction and taking the steel fabricating plant could be costly.

Alternative 1B: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative upgrades US 52 to meet 70-mph interstate standards by straightening the reverse curve between Waughtown Street and Mock Street. The alignment will be shifted entirely to the west between I-40 and Mock. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. All of the bridges on US 52 and its cross streets will have to be replaced, including the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek. The new alignment may cross Carolina Metalizing Company Superfund site located on Vargrave Street south of Waughtown Street.

With respect to the human environment, Alternative 1B will take structures to the west of US 52 and may encroach on Diggs Elementary School, but will not affect the Carolina Steel fabrication plant, a large industrial parcel on the eastern side of Vargrave Street. This plan may not affect the Liberia Baptist Church graveyard on the western side of the right-of-way. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the city to gain possession of the park in the near future. This plan offers some potential for redevelopment in the vicinity of Waughtown Street to the west of US 52 and to the west and south of Carolina Steel.

Construction and right-of-way costs will be in the middle compared to the other alternatives because the plan takes only smaller businesses, which should be easier to relocate. Vargrave Street will be difficult to relocate because of the proximity of the new alignment to the steel mill. This alignment will be difficult to construct because the new alignment crosses the existing alignment, complicating traffic control during construction.

Overall, Alternative 1B ranks in the middle with respect to the other alternatives, improving travel conditions to meet interstate standards. However, the difficulty of construction, the potential impact of the Superfund site near the right-of-way and the difficulty of maintaining Vargrave Street could be costly.

Alternative 1C: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative upgrades US 52 to meet 70-mph interstate standards by straightening the reverse curve between Waughtown Street and Mock Street. The alignment will be shifted entirely to the east between I-40 and Mock. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. All of the bridges on US 52 and its cross streets will have to be replaced, including

the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek.

With respect to the human environment, Alternative 1C will take structures to the east of US 52, including Carolina Steel fabricating plant and nearby businesses. It will not affect Diggs Elementary School or the Liberia Baptist Church graveyard on the western side of the right-of-way. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the City to gain possession of the park in the near future. This plan offers little potential for redevelopment in the vicinity of Carolina Steel but does open up some land to the west of US 52 for redevelopment or parkland.

Construction and right-of-way costs will be in the middle compared to the other alternatives because the realignment occurs primarily on new alignment but will take Carolina Steel fabricating plant and nearby businesses which may be costly to relocate. Vargrave Street can be relocated on land available from the new alignment.

Overall, Alternative 1C ranks as the second highest of the alternatives, improving travel conditions to meet interstate standards. However, relocating the steel mill may increase right-of-way costs.

Alternative 1D: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative upgrades US 52 to meet 70-mph interstate standards by straightening the reverse curve between Waughtown Street and Mock Street. The alignment will follow the existing alignment as closely as possible, shifting slightly to the west near Waughtown Street and to the east near the steel fabricating plant. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. All of the bridges on US 52 and its cross streets will have to be replaced, including the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street. The alignment will make it difficult to realign Vargrave Street near the steel mill.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek.

With respect to the human environment, Alternative 1D will take few structures to the east of US 52, but will not affect the Carolina Steel fabricating plant. It may affect Diggs Elementary School and the Liberia Baptist Church graveyard on the western side of the right-of-way. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the City to gain possession of the park in the near future. This plan offers no potential for redevelopment.

Construction and right-of-way costs will be relatively low compared to the other alternatives because the existing structures and roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, Alternative 1D ranks high with respect to the other alternatives, improving travel conditions with the lowest cost.

Alternative 1E: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative upgrades US 52 to meet 70-mph interstate standards by straightening the reverse curve between Waughtown Street and Mock Street. The alignment will be shifted entirely to the west between I-40 and Mock Street. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. All of the bridges on US 52 and its cross streets will have to be replaced, including the Winston-Salem Southbound Railroad bridge over US 52 north of Mock Street.

With respect to the natural environment, floodplain, wetland, utility and railroad crossing issues must be addressed at the proposed new parkway over Salem Creek. The new alignment may cross Carolina Metalizing Company Superfund site located on Vargrave Street south of Waughtown Street.

With respect to the human environment, Alternative 1E causes the greatest number of displacements. It will take many structures in the Sunnyside neighborhood to the west of US 52 and may encroach on Diggs Elementary School, but will not affect the Carolina Steel fabrication plant, a large industrial parcel on the eastern side of Vargrave Street. This plan may not affect the Liberia Baptist Church graveyard on the western side of the right-of-way. Civitan Park to the east of US 52 on Hall Street may not be an issue as Winston-Salem State University is in discussions with the City to gain possession of the park in the near future. This plan offers some potential for redevelopment in the vicinity of Sprague Street and Waughtown Street between Glendale Street and Vargrave Street to the west of US 52. A new frontage road could improve access to the industrial site at the southern end of Glendale Street.

Construction and right-of-way costs will be in the middle compared to the other alternatives because the plan reduces the number and length of structures on US 52 but takes a significant number of businesses and homes in the Sunnyside neighborhood. Vargrave Street will remain essentially in the same location under this plan. This alignment will be relatively easy to construct because the majority of the construction will be on new alignment, simplifying traffic control during construction.

Overall, Alternative 1E ranks in the middle with respect to the other alternatives, improving travel conditions to meet interstate standards. However, the cost of right-of-way, the superfund site near the right-of-way and the number of displacements could make this alternative difficult to construct.

6.3.2.2 Section 2: Diggs Boulevard to Northwest Boulevard

Since this section meets horizontal design standards, only two alternatives aside from the No Build Alternative were developed. The minimum design alternative proposes widening US 52 along the existing right-of-way and Alternative 2A establishes an alignment to the west of the existing right-of-way. Figure Series 6-2 illustrates the alternatives developed for Section 2.

Alternative 2 No Build: Under the No Build Alternative, no improvement is made to the current horizontal and vertical alignment and interchanges are unchanged. The vertical alignment does not meet current 60 mph freeway design standards in the vicinity of Martin Luther King, Jr. Drive nor will it meet 70 mph interstate design standards. The current four-lane cross-section will not meet 2025 traffic demand.

Alternative 2 Minimum: This plan does not meet interstate design standards, improves safety somewhat and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet current 60 mph design speed. The roadway will be widened to a six-lane freeway with auxiliary lanes between Business 40 and Martin Luther King, Jr. Drive, which meets 2025 traffic demand. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced, including railroad bridge over US 52 on the south side of the Business 40 interchange. This alignment will be difficult to construct because all widening will have to occur adjacent to active travel lanes.

With respect to the natural environment, part of the Business 40 interchange lies within the 100-year floodplain and may affect the proposed improvements.

With respect to the human environment, the minimum design alternative will take few structures. The symmetrical widening may cause the improvement to encroach on John F. Kennedy Middle School and playground that is located in the northeast quadrant of the Martin Luther King, Jr. Drive interchange. Encroachment on a public park or playground may require that a 4-f statement be filed during the environmental review process, a lengthy and difficult process. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be lower than the other alternative considered because the existing roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, the minimum design alternative ranks second with respect to the other alternatives, improving travel conditions slightly with the lowest cost.

Alternative 2A: This plan meets interstate design standards, improves safety somewhat and meets 2025 traffic demand. This alternative represents the improvement necessary for the freeway to meet 70 mph interstate design speed. The roadway will be widened to a six-lane freeway with auxiliary lanes between Business 40 and Martin Luther King, Jr. Drive, which meets 2025 traffic demand. Widening will be to the west to avoid the playground at John F Kennedy Middle School. All of the bridges on US 52 and its cross streets will have to be replaced, including a railroad bridge over US 52 on the south side of the Business 40 interchange. This alignment will be relatively easier to construct than the minimum design alternative because all widening will occur to the west of the existing travel lanes, simplifying traffic control during construction.

With respect to the natural environment, part of the Business 40 interchange lies within the 100-year floodplain and may affect the proposed improvements.

With respect to the human environment, Alternative 2A will take several structures to the west of US 52. By widening to the west, impacts to John F. Kennedy Middle School and playground can be avoided, eliminating the need for a Section 4(f) Statement during the environmental analysis process. This plan offers potential for redevelopment of several properties to the west of US 52, including some RJR property, which has been, identified as surplus property.

Construction and right-of-way costs will be somewhat higher than the other alternative considered because the existing roadway will be realigned to the west and additional right-of-way will be needed.

Overall, Alternative 2A ranks highest with respect to the other alternatives, improving travel conditions and providing opportunities to improve access to downtown while taking land for redevelopment.

6.3.2.3 Section 3: Northwest Boulevard to Glenn Avenue

This segment includes the Liberty Street corridor which crosses and is crossed by US 52 at New Hope Lane and 28th Street, isolating the Liberty Street properties between the two cross streets between the freeway and railroad tracks. This segment of US 52 has a substandard vertical design for a 60-mph freeway and has a substandard horizontal and vertical design for an interstate. To improve the roadway geometry, five alternative designs were prepared and compared to the No Build Alternative. The alternative designs range from widening adjacent to the existing roadway to changing the alignment of both US 52 and Liberty Street. Figure Series 6-3 illustrates the alternatives developed for Section 3.

Alternative 3 No Build: Under the No Build Alternative, no improvement is made to the current horizontal and vertical alignment and the 25th/28th Street interchange is unchanged. (The exit ramp at Liberty Street south of the airport is scheduled for removal as part of another bridge replacement project on US 52.) The vertical alignment does not meet current 60 mph freeway design standards. Under interstate design standards, neither the horizontal nor the vertical alignment meet 70 mph design standards. The current four-lane cross-section will not meet 2025 traffic demand.

Alternative 3 Minimum: This plan does not meet interstate design standards, improves safety somewhat and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet current 60 mph design speed. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced, except for the US 52 bridge over Liberty Street and the Norfolk Southern tracks south of the airport. This bridge is scheduled for replacement within the next five years (by 2007). This alignment will be difficult to construct because all widening will have to occur adjacent to active travel lanes.

With respect to the natural environment, there is no natural feature to take into consideration.

With respect to the human environment, the minimum design alternative will take structures bordering US 52 on both sides as there is no additional right-of-way available for widening in the area. The symmetrical widening may cause the improvement to encroach on Fairview Park located on New Hope Lane at Liberty Street, which would require that a 4-f statement be filed as part

of the environmental review process, a lengthy and difficult procedure. The Canaan Baptist Church and part of Piedmont Park (a public housing development) would also be affected by the symmetrical widening project. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be lower than the other alternatives considered because the existing roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, the minimum design alternative ranks low with respect to the other alternatives, improving travel conditions slightly with the lowest cost but still separating Liberty Street from Northeast Winston and providing little opportunity for redevelopment.

Alternative 3A: This plan upgrades the horizontal and vertical alignment to meet interstate design standards, improves safety and meets 2025 traffic demand. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. Widening will be symmetrical along the centerline, shifting slightly to the west to improve the horizontal geometry to meet standards. All of the bridges on US 52 and its cross streets will have to be replaced, except for the US 52 bridge over Liberty Street and the Norfolk Southern tracks south of the airport. This bridge is scheduled for replacement within the next five years (by 2007). This alignment will be difficult to construct because all widening will have to occur adjacent to active travel lanes.

With respect to the natural environment, there is no natural feature to take into consideration.

With respect to the human environment, Alternative 1A will take structures bordering US 52 on both sides as there is no additional right-of-way available for widening in the area. The alignment may cause the improvement to encroach on Fairview Park located on New Hope Lane at Liberty Street, which would require that a Section 4(f) Statement be filed as part of the environmental review process, a lengthy and difficult procedure. The Canaan Baptist Church and part of Piedmont Park (a public housing development) would also be affected by the plan. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be close to those for the minimum design alternative and lower than other alternatives considered because the existing roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, Alternative 3A ranks in the middle with respect to the other alternatives, improving travel conditions to meet interstate design standards with low cost but still separating Liberty Street from Northeast Winston and providing little opportunity for redevelopment.

Alternative 3B: This plan upgrades the horizontal and vertical alignment to meet interstate design standards, improves safety and meets 2025 traffic demand. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. US 52 will be realigned to the west, close to the railroad tracks paralleling US 52. All of the bridges on US 52 and its cross streets will have to be replaced, including a shorter US 52 bridge over Liberty Street and the Norfolk Southern tracks south of the airport. The latter bridge is scheduled for replacement within the next five years (by 2007). This alignment will be easier to construct because most of the roadway is on new alignment, including a new but shorter bridge over the rail yards. However, the alignment is very close to an active rail line. Replacing the 25th/28th Street interchange will be very difficult with this alignment.

With respect to the natural environment, there is no natural feature to take into consideration.

With respect to the human environment, Alternative 1B will take structures to the west of US 52 between Liberty Street and the railroad tracks. The alignment may cause the improvement to encroach on Fairview Park located on New Hope Lane at Liberty Street, which would require that a Section 4(f) Statement be filed as part of the environmental review process, a lengthy and difficult procedure. The Canaan Baptist Church would also be affected by the plan. Piedmont Park (a public housing development) would not be affected by this plan. Liberty Street would remain substantially in the same location, with some realignment necessary to the south of the airport. Because US 52 is relocated to the west of Liberty Street, the latter roadway would be reunited with the Northeast Winston neighborhood. This plan offers some potential for redevelopment along the relocated Liberty Street.

Construction and right-of-way costs will be higher than for the minimum design alternative and Alternative 3A because US 52 is on a new alignment, requiring substantial right-of-way.

Overall, Alternative 3B ranks in the middle with respect to the other alternatives, improving travel conditions to meet interstate design standards, having higher costs, reuniting Liberty Street with the Northeast Winston neighborhood and providing some opportunity for redevelopment. Its drawback is that it is very difficult to locate an interchange at 27th/28th Street because of US 52's proximity to the railroad tracks and the replacement bridge over the railroad tracks would be abandoned.

Alternative 3C: This plan upgrades the horizontal and vertical alignment to meet interstate design standards, improves safety and meets 2025 traffic demand. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. US 52 will be realigned to the west, approximately midway between the existing alignment and the Norfolk Southern Railroad tracks. Liberty Street would be relocated to the east, approximately along the current US 52 alignment. All of the bridges on the cross streets and US 52 will have to be replaced, except the bridge over Liberty Street and the Norfolk Southern tracks south of the airport which will have to be widened to accommodate the new alignment. The latter bridge is scheduled for replacement within the next five years (by 2007). This alignment will be easier to construct because most of the roadway is on new alignment. This alignment allows for enough land to replace the 25th/28th Street interchange with an urban diamond that meets interstate standards.

With respect to the natural environment, there is no natural feature to take into consideration.

With respect to the human environment, Alternative 3C will take the majority of the structures between US 52 and the railroad tracks from New Hope Lane to 28th Street. The alignment may cause the improvement to encroach on Fairview Park located on New Hope Lane at Liberty Street, which would require that a Section 4(f) statement be filed as part of the environmental review process, a lengthy and difficult procedure. The Canaan Baptist Church and Piedmont Park (a public housing development) would also be affected by the plan. Liberty Street would be realigned and rebuilt for its entire length between New Hope Lane and 30th Street. Because US 52 is relocated to the west of Liberty Street, the latter roadway would be reunited with the Northeast Winston neighborhood. This plan offers a great potential for redevelopment to occur along the new Liberty Street alignment.

Construction and right-of-way costs will be higher than for the other alternatives because both US 52 and Liberty Street are on new alignments, requiring substantial right-of-way.

Overall, Alternative 3C ranks high with respect to the other alternatives, improving travel conditions to meet interstate design standards, reuniting Liberty Street with the Northeast Winston neighborhood and providing good opportunity for redevelopment. Its drawbacks are that extensive right-of-way requirements will increase the cost, and that the replacement bridge over the railroad tracks would have to be widened raising constructability issues.

Alternative 3D: This plan upgrades the horizontal and vertical alignment to meet interstate design standards, improves safety and meets 2025 traffic demand. The roadway will be widened to a six-lane freeway, which meets 2025 traffic demand. US 52 will be realigned to the west, approximately midway between the existing alignment and the Norfolk Southern Railroad tracks. Liberty Street would be relocated to the east, approximately along the current US 52 alignment. All of the bridges on US 52 and its cross streets will have to be replaced, including the bridge over Liberty Street and the Norfolk Southern tracks south of the airport. The latter bridge is scheduled for replacement within the next five years (by 2007). This alignment will be easier to construct because most of the roadway is on new alignment. This alignment allows for enough land to replace the 25th/28th Street interchange with an urban diamond that meets interstate standards.

With respect to the natural environment, there is no natural feature to take into consideration.

With respect to the human environment, Alternative 3D will take the majority of the structures between US 52 and the railroad tracks from New Hope Lane to 28th Street. The alignment may cause the improvement to encroach on Fairview Park located on New Hope Lane at Liberty Street, which would require that a Section 4(f) Statement be filed as part of the environmental review

process, a lengthy and difficult procedure. The Canaan Baptist Church and Piedmont Park (a public housing development) would also be affected by the plan. Liberty Street would be realigned and rebuilt for its entire length between New Hope Lane and 30th Street. Because US 52 is relocated to the west of Liberty Street, the latter roadway would be reunited with the Northeast Winston neighborhood. This plan offers a great potential for redevelopment to occur along Liberty Street.

Construction and right-of-way costs will be higher than for the other alternatives because both US 52 and Liberty Street are on new alignments, requiring substantial right-of-way.

Overall, Alternative 3D ranks high with respect to the other alternatives, improving travel conditions to meet interstate design standards, reuniting Liberty Street with the Northeast Winston neighborhood and providing good opportunity for redevelopment. Because the route is on new alignment, the alternative would be easiest to construct. Its drawback is the higher costs associated with extensive right-of-way requirements, and the abandoning of the replacement bridge over the railroad tracks.

6.3.2.4 Section 4: Glenn Avenue to Motor Road

Since this section meets horizontal and vertical design standards and there is sufficient right-of-way available north of Patterson Avenue, only one alternative- the minimum design alternative- was developed aside from the No Build Alternative. The minimum design alternative proposes widening US 52 to six lanes within the median. Figure 6-4 illustrates the alternative developed for Section 4.

Alternative 4 No Build: Under the No Build Alternative, no improvement is made to the current horizontal and vertical alignment and interchanges are unchanged. Both the horizontal and vertical alignment meet current 60 mph freeway design standards as well as 70 mph interstate design standards. However, the current four-lane cross-section will not meet 2025 traffic demand.

Alternative 4 Minimum: This plan meets interstate design standards, improves safety somewhat and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet 70 mph design speed. Between Glenn Avenue and Patterson Avenue, the roadway will be widened to a six-lane freeway along the outside lanes; from Patterson Avenue north, the roadway will be widened to a six-lane freeway within the center median. The proposed widening will meet 2025 traffic demand. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced. This alignment will be easy to construct because the majority of the widening occurs within the median and will not require right-of-way, although the traffic control will have to maintain traffic flow in adjacent travel lanes.

With respect to the natural environment, the Leak Fork parallels US 52 to the east between Patterson Avenue and Germanton Road. Wetlands associated with the creek appear to be far enough from the right-of-way to remain unaffected by the roadway widening. Also, since widening occurs within the median in the vicinity of Leak Fork, no significant impacts to the natural environment are anticipated.

With respect to the human environment, the minimum design alternative will take few structures because much of the widening occurs within the existing right-of-way. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be low for this alternative because the existing roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, the minimum design alternative ranks highest, improving travel conditions to meet interstate design standards with low costs.

6.3.2.5 Section 5: Motor Road to Oak Summit Road

Since this section meets horizontal and vertical design standards and there is sufficient right-of-way available north of Patterson Avenue, only one alternative- the minimum design alternative- was developed aside from the No Build Alternative. The minimum design alternative proposes widening US 52 to six lanes within the median. Figure 6-5 illustrates the alternative developed for Section 5.

Alternative 5 No Build: Under the No Build Alternative, no improvement is made to the current horizontal and vertical alignment and interchanges are unchanged. Both the horizontal and vertical alignment meet current 60-mph freeway design standards as well as 70-mph interstate design standards. However, the current four-lane cross-section will not meet 2025 traffic demand.

Alternative 5 Minimum: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet 70-mph design speed. From Patterson Avenue north, the roadway will be widened to a six-lane freeway within the center median. The proposed widening will meet 2025 traffic demand. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced. This alignment will be easy to construct because all of the widening occurs within the median and will not require right-of-way, although the traffic control will have to maintain traffic flow in adjacent travel lanes.

With respect to the natural environment, the Leak Fork parallels US 52 to the east between Patterson Avenue and Germanton Road, where it crosses under the freeway. Wetlands associated with the creek appear to be far enough from the right-of-way to be unaffected by the roadway widening. Also, since widening occurs within the median in the vicinity of Leak Fork, no significant impacts to the natural environment are anticipated.

With respect to the human environment, the minimum design alternative will take no structure because all of the widening occurs within the existing right-of-way. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be low for this alternative because the existing roadway will be used to the greatest extent possible and little right-of-way will be needed.

Overall, the minimum design alternative ranks highest, improving travel conditions to meet interstate design standards with low costs.

6.3.2.6 Section 6: Oak Summit Road to Northern Project Limit

Since this section meets horizontal and vertical design standards and there is sufficient right-of-way available north of Patterson, two alternatives - the minimum design alternative and one interstate design alternative - were developed aside from the No Build Alternative. The minimum design alternative proposes widening US 52 to six lanes within the median; alternative 6A also widens within the median but includes additional lanes between interchanges. Figure Series 6-6 illustrates the alternatives developed for Section 6.

Alternative 6 No Build: Under the No Build Alternative, no improvement is made to the current horizontal and vertical alignment and interchanges are unchanged. Both the horizontal and vertical alignment meet current 60-mph freeway design standards as well as 70-mph interstate design standards. However, the current four-lane cross-section will not meet 2025 traffic demand.

Alternative 6 Minimum: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative represents the minimum improvement necessary for the freeway to meet 70-mph design speed. From Patterson Avenue north, the roadway will be widened to a six-lane freeway within the center median. The proposed widening will meet 2025 traffic demand. However, the plan does not address the close spacing of the University Parkway and Hanes Mill Road interchanges. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced. This alignment will be easy to construct because all of the widening occurs within the median and will not require right-of-way, although the traffic control will have to maintain traffic flow in adjacent travel lanes.

With respect to the natural environment, Mill Creek crosses under the freeway to the south of the University Parkway interchange and this interchange may lie within the 100-year flood plain. There appears to be no mapped wetlands in the vicinity of the

freeway.

With respect to the human environment, the minimum design alternative will take no structure because all of the widening occurs within the existing right-of-way. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be low for this alternative because the existing roadway will be used to the greatest extent possible and no additional right-of-way will be needed.

Overall, the minimum design alternative ranks in the middle, improving travel conditions to meet interstate design standards with low costs but failing to address the close proximity of the two interchanges.

Alternative 6A: This plan meets interstate design standards, improves safety and meets 2025 traffic demand. This alternative represents the improvements necessary for the freeway to meet 70-mph design speed. From Patterson Avenue north, the roadway will be widened to a six-lane freeway within the center median. The proposed widening will meet 2025 traffic demand and addresses the close spacing of the University Parkway and Hanes Mill Road interchanges by adding auxiliary lanes. Widening will be symmetrical along the centerline. All of the bridges on US 52 and its cross streets will have to be replaced. This alignment will be easy to construct because all of the widening occurs within the median and will not require right-of-way, although the traffic control will have to maintain traffic flow in adjacent travel lanes.

With respect to the natural environment, Muddy Creek crosses under the freeway to the south of the University Parkway interchange and this interchange may lie within the 100-year flood plain. There appears to be no mapped wetlands in the vicinity of the freeway.

With respect to the human environment, Alternative 6A may take several structures to accommodate outside auxiliary lanes. This plan offers little potential for redevelopment.

Construction and right-of-way costs will be slightly higher for this alternative. However, the existing roadway will be used to the greatest extent possible and little additional right-of-way will be needed.

Overall, the Alternative 6A ranks highest, improving travel conditions to meet interstate design standards with low costs and addressing the issue of close proximity of the two interchanges.

	Design	Alternative 1	Alternative 2
Section 1: I-40 to Diggs Boulevard/ Vargrave Street	1 Min	Alternative 1C	Alternative 1D
Section 2: Diggs Boulevard/ Vargrave Street to Northwest Boulevard	2 Min	Alternative 2 Min	Alternative 2A
Section 3: Northwest Boulevard to Glenn Avenue	3 Min	Alternative 3A	Alternative 3D
Section 4: Glenn Avenue to Mills Road	4 Min	Alternative 4 Min	Alternative 4A
Section 5: Mills Road to Oak Summit Road	5 Min	Alternative 5 Min	Alternative 5A
Section 6: Oak Summit Road to Zigar Road	6 Min	Alternative 6 Min	Alternative 6A

In Tier 2, alternative interchange plans will be developed for the selected main line alternatives and further analyzed.

Table 6-1
Evaluation Matrix - Tier 1 Alternatives

EVALUATION CRITERIA	Section 1: I-40 to Diggs Blvd.							Section 2: Diggs Blvd. to Northwest Blvd.			Section 3: Northwest Blvd. to Glenn Ave.						Section 4: Glenn Ave. to Motor Rd.		Section 5: Motor Rd. to Oak Summit Rd.		Section 6: Oak Summit Rd. to Northern Project Limit			
	Alt 1NB	Alt 1Min	Alt 1A	Alt 1B	Alt 1C	Alt 1D	Alt 1E	Alt 2NB	Alt 2Min	Alt 2A	Alt 3NB	Alt 3Min	Alt 3A	Alt 3B	Alt 3C	Alt 3D	Alt 4NB	Alt 4Min	Alt 5NB	Alt 5Min	Alt 6NB	Alt 6Min	Alt 6A	
Physical Impacts																								
Horizontal Alignment																								
Vertical Alignment																								
Structures/ Railroad Conflicts																								
Constructability																								
Environmental Considerations																								
Wetlands																								
Noise																								
Visual Impacts																								
Air Quality																								
Contamination Sites																								
Flood Plains																								
Cultural Impacts																								
Historical Sites																								
Displacements																								
Community Facilities																								
Redevelopment Opportunities																								
Traffic and Safety Impacts																								
Safety Improvements																								
Congestion																								
Cost Analysis																								
Construction Costs																								
Right-of-Way Costs																								
OVERALL																								



Alternative Descriptions:

Section 1: I-40 to Diggs Blvd.

- Alt 1NB: No Build alternative
- Alt 1Min: Minimum improvement at 60 mph design speed
- Alt 1A: At 70 mph design speed, from I-40 to Vargrave St., alignment is west of existing; from Vargrave Street to Mock Street, alignment is east of existing.
- Alt 1B: At 70 mph design speed, alignment is west of existing;
- Alt 1C: At 70 mph design speed, alignment is east of existing;
- Alt 1D: At 70 mph design speed, balanced alignment
- Alt 1E: At 70 mph design speed, alignment is far west of existing;

Section 2: Diggs Blvd. to Northwest Blvd.

- Alt 2NB: No Build alternative
- Alt 2Min: Minimum improvement at 60 mph design speed
- Alt 2A: At 70 mph design speed, widening includes frontage roads

Section 3: Northwest Blvd. to Glenn Ave.

- Alt 3NB: No Build alternative
- Alt 3Min: Minimum improvement at 60 mph design speed
- Alt 3A: At 70 mph design speed, widening along existing centerline
- Alt 3B: At 70 mph design speed, widen west of existing centerline along RR tracks
- Alt 3C: At 70 mph design speed, widen between existing and western alignments
- Alt 3D: At 70 mph design speed, widen between existing and western alignments with new bridge crossing at Liberty Street

Section 4: Glenn Ave. to Motor Rd.

- Alt 4NB: No Build alternative
- Alt 4Min: Minimum improvement at 60 mph design speed

Section 5: Motor Rd. to Oak Summit Rd.

- Alt 5NB: No Build alternative
- Alt 5Min: Minimum improvement at 60 mph design speed

Section 6: Oak Summit Rd. to Northern Project Limit

- Alt 6NB: No Build alternative
- Alt 6Min: Minimum improvement at 60 mph design speed
- Alt 6A: At 70 mph design speed, widen with c/d road.

Figure 6-1
1 of 6

Figure 6-1
2 of 6

Figure 6-1
3 of 6

Figure 6-1
5 of 6

Figure 6-4
1 of 1

Figure 6-5
1 of 1

Figure 6-6
1 of 2

Figure 6-6
2 of 2

6.5 Land Use And Economic Development Market Analysis

As part of the Tier 1 Analysis, an assessment was conducted of the projected economic market for potential development uses within the US 52 Corridor. These development uses include industrial, retail, residential, and lodging and restaurant space. Taken together with other improvements planned for the study area, these types of development uses offer ample opportunity to make the US 52 Corridor one of the City's premier development areas.

The US 52 Corridor study area offers numerous advantages to developers, such as a central location within Forsyth County and easy accessibility to north/south and east/west interstate highways. With a concerted planning and design effort, the area could build on these strengths and become an attractive area for intensive economic development.

6.5.1 Industrial Market Assessment

This analysis examines the projected demand for industrial land with the US 52 Corridor in the coming decades. In order to effectively draft and implement a land use plan for this emerging corridor, it is important to understand how the region's changing economy will affect what types of industries the land use plan should be oriented to serve, and how much aggregate land demand there would likely be.

The US 52 Corridor project carries a great deal of potential for the continued growth of Winston-Salem's economy. With the eventual completion of I-74 throughout North Carolina, Winston-Salem will find itself situated at the crossroads of both a major north/south Interstate as well as a major east/west Interstate (I-40). In addition, the nearby Piedmont Triad International Airport is emerging as a major air shipment hub, further augmenting the Triad's position as a crossroads of commerce. With a concerted effort, it is reasonable to expect substantial benefits to accrue to the City of Winston-Salem from these developments. The City's US 52 Corridor is an ideal place to plan for the future expansion of Winston-Salem's economy; the area holds excellent access to transportation, is an historically industrial area, and with sufficient planning, will hold an ample supply of developable land.

Winston-Salem's economy is at a crossroads now as well. The City's traditional economic bulwarks of manufacturing (tobacco, textiles, and apparel) are going through changes in their employment and output structures that have already greatly affected the region's employment base. These changes will likely continue in the coming years and decades, lessening the dominance that these industries once held on Winston-Salem's employment ranks.

But at the same time, new strengths will emerge in Winston-Salem's industrial sector, as North Carolina in general attracts new industries, and Forsyth County likewise builds its share of these new sectors.

6.5.1.1 Industrial Acreage Demand Projections

In order to project the demand for industrial space within the US 52 Corridor, estimates were developed for employment, space, and acreage demands for Forsyth County for several industrial sectors.

The following assumptions were used:

- **Timeframe:** The time focus of this analysis is the 25-year period between 2020 and 2045. 2020 was used as the base year because it is assumed that the US 52 Corridor project will be completed by that time.
- **Sectors that Constitute Industrial Employment:** For the purposes of this analysis, the term *industrial* applies to manufacturing industries, as well as the trucking sector and the wholesale trade sector.
- **Two Sources of Industrial Acreage Demand:** Demand for new industrial space in the US 52 Corridor will come from two sources: new industries that are building new facilities, and established industries that are replacing older, obsolete facilities. Both of these sources of demand are analyzed below.

New Industrial Growth Acreage Demand

Considerable new demand for industrial space will materialize in North Carolina. Although not every industrial sector is projected to grow in terms of employment (notable exceptions include the tobacco, textile, and apparel industries), many prominent industrial sectors are projected to grow.

The most recent long-range industry-specific forecasts for employment growth (from the U.S. Bureau of Economic Analysis), identified several industrial sectors as likely to achieve high growth in North Carolina by 2045. The following analysis concentrates on these select industries as sources of future acreage demand in the industrial portion of the US 52 Corridor. These include the following manufacturing sectors:

- Fabricated Metals
- Transportation Equipment
- Instruments
- Food Products
- Paper Products
- Printing and Publishing
- Chemicals
- Rubber and Plastic Products

In addition, the following non-manufacturing sectors were likewise identified as being high growth industries and are likewise included in the acreage demand analysis:

- Trucking
- Wholesale Trade

Table 6-2. Statewide Employment and Projected Employment in Industrial Growth Sectors, 2000-2045

Sector	2000	2015	2045	2015-2045
Primary Metals	37,381	38,783	41,586	2,804
Transportation Equip.	37,359	41,953	47,152	5,199
Instruments	15,716	18,094	20,782	2,688
Food Products	53,418	56,566	61,240	4,674
Paper Products	23,852	26,282	29,342	3,060
Printing & Publishing	34,252	41,507	49,859	8,352
Chemicals	48,572	53,068	58,533	5,465
Rubber & Plastics	41,515	49,566	58,005	8,439
Trucking	65,696	77,232	89,442	12,210
Wholesale Trade	201,136	231,881	265,308	33,427

Sources: Employment Security Commission of North Carolina, U.S. Bureau of Economic Analysis, and Hammer, Siler, George Associates.

These projections run through 2045, and the projected percent statewide increase in employment for each sector was applied to the corresponding 2000 statewide employment figures, as obtained from the Employment Security Commission of North Carolina. The result is the projected increase in employment for the period of 2015-2045. This is shown in Table 6-2 below:

The above table shows the total statewide growth in employment in these sectors. Forsyth County, as one of the state's largest and most industrialized counties, can be expected to capture a significant proportion of this statewide growth. It is estimated that Forsyth County can capture 5 percent of the manufacturing industries' growth and a slightly larger 7.5 percent

of the trucking and wholesale growth (the County's location at the crossroads of two major Interstate highway routes, and being proximate to Piedmont Triad International Airport, makes a highly suitable location for trucking and wholesaling).

Table 6-3. Forsyth County Projected Job Growth in Industrial Growth Sectors, 2015-2045

Sector	Statewide 2015-2045 Job Growth	Est. Capture Rate for Forsyth Co.	Forsyth Co. 2015-2045 Job Growth
Primary Metals	2,804	5.00%	140
Transportation Equipment	5,199	5.00%	260
Instruments	2,688	5.00%	134
Food Products	4,674	5.00%	234
Paper Products	3,060	5.00%	153
Printing & Publishing	8,352	5.00%	418
Chemicals	5,465	5.00%	273
Rubber & Plastics	8,439	5.00%	422
Total, High Growth Manufacturing	40,681	5.00%	2,034
Trucking	12,210	7.50%	916
Wholesale Trade	33,427	7.50%	2,507

Sources: U.S. Bureau of Economic Analysis and Hammer, Siler, George Associates.

Table 6-3 shows the estimated capture rates and corresponding job growth projections for Forsyth County for the selected industrial sectors.

Translating the above job growth projections into estimated demand for built space can be accomplished by applying measures of industrial employment density, as expressed in a figure of square feet used for each employee. For this analysis, manufacturing industries are given a density of 650 square feet per employee, while the trucking and wholesale trade industries are given a

Table 6-4. Estimated Demand for New Built Space in Industrial Growth Sectors, 2015-2045, Forsyth County

Sector	Forsyth Co. 2015-2045 Job Growth	Est. Sq. Ft. Per Employee	Est. Sq. Ft. of Built Space Demand
High Growth Manufacturing Sectors	2,034	650	1,322,143
Trucking	916	1,200	1,098,929
Wholesale Trade	2,507	1,200	3,008,420
Total Space New Industrial Demand			5,429,492

Source: Hammer, Siler, George Associates.

density of 1,200 square feet per employee. The table below shows how this can be fashioned into a demand for square feet of built space.

As shown, there is projected to be a demand for over 5.4 million square feet of new industrial space in Forsyth County over the period of 2015 to 2045. To convert this figure into a demand for land (as opposed to building space), one can apply anticipated floor-to-area ratios to estimate the amount of acreage that this demand would consume. Based on industrial averages, the manufacturing component of this demand is projected to have a floor-to-area ratio (FAR) of 3.5 (meaning that 3.5 acres of land

Table 6-5. Estimated Demand for Acreage in Industrial Growth Sectors, 2015-2045, Forsyth County

Sector	Est. Sq. Ft. of Built Space Demand	Estimated Floor-to-Area Ratio	Est. Land Demand in Acres*
High Growth Manufacturing Sectors	1,322,143	3.5	105
Trucking	1,098,929	4	100
Wholesale Trade	3,008,420	4	275
Total Space New Industrial Demand	5,429,492		480

*Note: Numbers Rounded.

Source: Hammer, Siler, George Associates.

will be demanded for every 1 acre of indoor space), and the trucking and wholesale components will have an FAR of 4.0. Table 6-5 shows these calculations.

The above analysis illustrates that approximately 480 acres of land will be required to satisfy the space demands from the above-identified high-growth industrial sectors within Forsyth County. The US 52 Corridor, having ready access to the County's

Table 6-6. Estimated Demand for Acreage in Industrial Growth Sectors, 2015-2045, US 52 Corridor

Sector	Est. Demand, In Acres, Forsyth Co.	Est. US 52 Corridor Capture Rate	Est. Demand, In Acres*, US 52 Corridor
High Growth Manufacturing Sectors	105	40%	42
Trucking	100	40%	40
Wholesale Trade	275	40%	110
Total Space New Industrial Demand	480		192

*Note: Numbers Rounded.

Source: Hammer, Siler, George Associates.

interstate highways, and having an existing infrastructure network, will be competitive with other parts of the county and will capture a significant portion of the projected industrial growth. It is estimated that the Corridor area can capture roughly 40 percent of this growth during the 2015-2045 period. This Corridor industrial acreage demand is illustrated below.

According to the above projections, the US 52 Corridor can be expected to absorb almost 200 acres of land due to the demands of high-growth industrial sectors during the period of 2015 to 2045.

This demand, however, is only one component of the total projected industrial space demands for the Corridor. There will also be significant demands from the County's existing industries, in order to effectuate the replacement of aged or obsolete industrial space.

Industrial Replacement Acreage Demand

Industrial space has a relatively brief life span, with most industrial space reaching functional obsolescence within 50 years. The need to replace obsolete manufacturing space will create additional industrial space demands within the US 52 Corridor.

Table 6-7. Employment in Industrial Sectors, 2000-2015, Forsyth County

Sector	2000 Employment	% Growth, 2000-2015	Projected 2015 Employment
Manufacturing	31,461	-2.30%	30,727
Trucking	3,865	22.40%	4,732
Wholesale Trade	7,519	15.50%	8,684

Sources: Employment Security Commission of North Carolina, U.S. Bureau of Economic Analysis, and Hammer, Siler, George Associates.

Table 6-8. Estimated Square Footage of Space in Industrial Sectors, Forsyth County, 2015

Sector	Projected 2015 Employment	Est. Sq. Ft. Per Employee	Est. Sq. Ft. of Industrial Space
Manufacturing	30,727	650	19,972,690
Trucking	4,732	1,200	5,677,883
Wholesale Trade	8,684	1,200	10,420,699

Sources: Employment Security Commission of North Carolina, U.S. Bureau of Economic Analysis, and Hammer, Siler, George Associates.

Table 6-9. Estimated Replacement of Industrial Space, Forsyth County, 2015-2045

Sector	Est. Sq. Ft. of Industrial Space, 2015	% Annually Replaced for Obsolescence	St. Ft. Annually Replaced for Obsolescence*
Manufacturing	19,972,690	1%	200,000
Trucking	5,677,883	1%	57,000
Wholesale Trade	10,420,699	1%	104,000
			361,000

*Note: Numbers Rounded.
Source: Hammer, Siler, George Associates.

Such demands are analyzed for the Manufacturing, Trucking, and Wholesale sectors. All manufacturing sectors are included in this analysis, not just those identified as growth sectors, because replacement needs affect all industrial employers.

Table 6-7 shows the amount of industrial employment in these given sectors projected for Forsyth County in 2015.

To estimate the amount of square footage of building space these figures represent, one can apply measures of industrial employment density, as expressed in a figure of square feet used for each employee. Similar to the new industry analysis above, manufacturing industries are given a density of 650 square feet per employee, while the trucking and wholesale trade industries are given a density of 1,200 square feet per employee. The table below shows how this is translated into an estimate of square footage of built space.

As stated earlier, industrial space tends to reach functional obsolescence within 50 years. This means that on average, 2 percent of a region's industrial space reaches obsolescence in any given year. Obsolete space can be brought to modern standards by replacement or refurbishment, and it is estimated that about half of that space (or 1 percent of total industrial space) will be modernized through replacement, yielding additional demand for industrial space, even from industries that are not necessarily growing in terms of employment and/or output.

The table below shows the effect of this 1 percent yearly replacement measure on Forsyth County's projected 2015 industrial base.

The table at left illustrates there to be a projected annual demand for about 361,000 square feet of replacement industrial space in Forsyth County for the period of 2015 to 2045. To convert this figure into a demand for land (as opposed to

Table 6-10. Estimated Annual Acreage Demand for Replacement Industrial Space, 2015-2045, Forsyth County

Sector	Est. Sq. Ft. of Built Space Demand	Est. Floor-to-Area Ratio	Est. Land Demand in Acres*
Manufacturing	200,000	3.5	16
Trucking	57,000	4	5
Wholesale Trade	104,000	4	10
Total Replacement Demand	361,000		31

Source: Hammer, Siler, George Associates.

building space), one can apply floor-to-area ratios to estimate the amount of acreage that this demand would consume. Based on industrial averages, the manufacturing component of this demand is projected to have a floor-to-area ratio (FAR) of 3.5 (meaning that 3.5 acres of land will be demanded for every 1 acre of indoor space), and the trucking and wholesale components will have an FAR of 4.0. Table 6-10 shows these calculations.

Table 6-11. Estimated Total Acreage Demand for Replacement Industrial Space, 2015-2045, US 52 Corridor

Sector	Est. Annual Land Demand, Forsyth County	Total Demand, 2015-2045, Forsyth County	Est. US 52 Corridor Capture Rate	Est. Demand, in Acres, US 52 Corridor
Manufacturing	16	480	40%	192
Trucking	5	150	40%	60
Wholesale Trade	10	300	40%	120
Total Replacement Demand	31	930		372

Source: Hammer, Siler, George Associates.

With an estimated annual land demand of approximately 31 acres due to industrial replacement, the County can therefore expect to absorb nearly 1,000 such acres over the 30-year period of 2015-2045. As with the demand for new industrial space detailed previously, it is estimated that the US 52 Corridor area can capture roughly 40 percent of this total demand during the 2015-2045 period. This is shown below:

As shown, approximately 372 acres of demand is projected to be generated within the US 52 Corridor over the 2015-2045 period due to industrial replacement demands.

6.5.1.2 Total Corridor Industrial Acreage Demand

As detailed, demand for industrial acreage within the Corridor will come from two sources: new industrial growth and replacement industrial demands. Taken together, these add up to a significant demand for land within the Corridor; this is shown below:

Table 6-12. Total Industrial Space Demand, US 52 Corridor, 2015-2045

Sector	2015-2045 Acreage Demand
New Industrial Growth Demand	192
Replacement Industrial Demand	372
Total Demand	564

Source: Hammer, Siler, George Associates.

Table 6-12 shows that for the entire 30-year period of 2015-2045, the US 52 Corridor will see a demand for approximately 564 acres for industrial development, taking into consideration both new industrial demand, and replacement industrial demand.

6.5.2 Retail Market Assessment

This section of the report projects the US 52 Corridor’s demand for two types of retail establishments – those of convenience goods retailers and of value-oriented retailers. With the US 52 Corridor project targeted for completion by 2020, this analysis looks at the amount of retail demand that will likely develop in the area between now and 2020 – taking into account projected increases in population and in consumer expenditures.

The analyses that follow show that there is a projected demand for increased retail space in the US 52 Corridor area in both of the retail categories being examined.

6.5.2.1 Convenience Goods and Personal Services

Establishments providing convenience goods and personal services include stores selling groceries, those selling drug store items, and establishments providing personal services such as laundry services, and personal beauty/barber services. This analysis examines the projected demand for such establishments in the US 52 Corridor.

Convenience goods and personal services establishments provide everyday items or services that people are most likely to acquire at retail/service venues nearby to their place of residence. As such, the trade area for convenience goods and personal services is relatively small – estimated here to include the neighborhoods closely surrounding US 52 itself.

Convenience Goods Trade Area

Most convenience goods are purchased at stores nearby customers’ homes. For daily needs items such as groceries, toiletries, laundry services, etc., there is relatively little engagement in comparison shopping, and consumers tend to patronize establishments that are proximate to their places of residence. Therefore, the “trade area” for convenience goods and personal services for the Corridor area is defined as being the fourteen Census Tracts that adjoin US 52 in its path through the city. This area, along with its included numbered Census Tracts, is shown on Map 6-1.

This trade area extends along US 52 for approximately 13 miles. The width of the trade area varies with the boundaries of the component Census Tracts, from a total width of about three-fourths of a mile in the downtown areas, to upwards of two miles in the northern stretches of the corridor where the populations density is lower.

Map 6-1. Convenience Goods Trade Area, by Census Tract

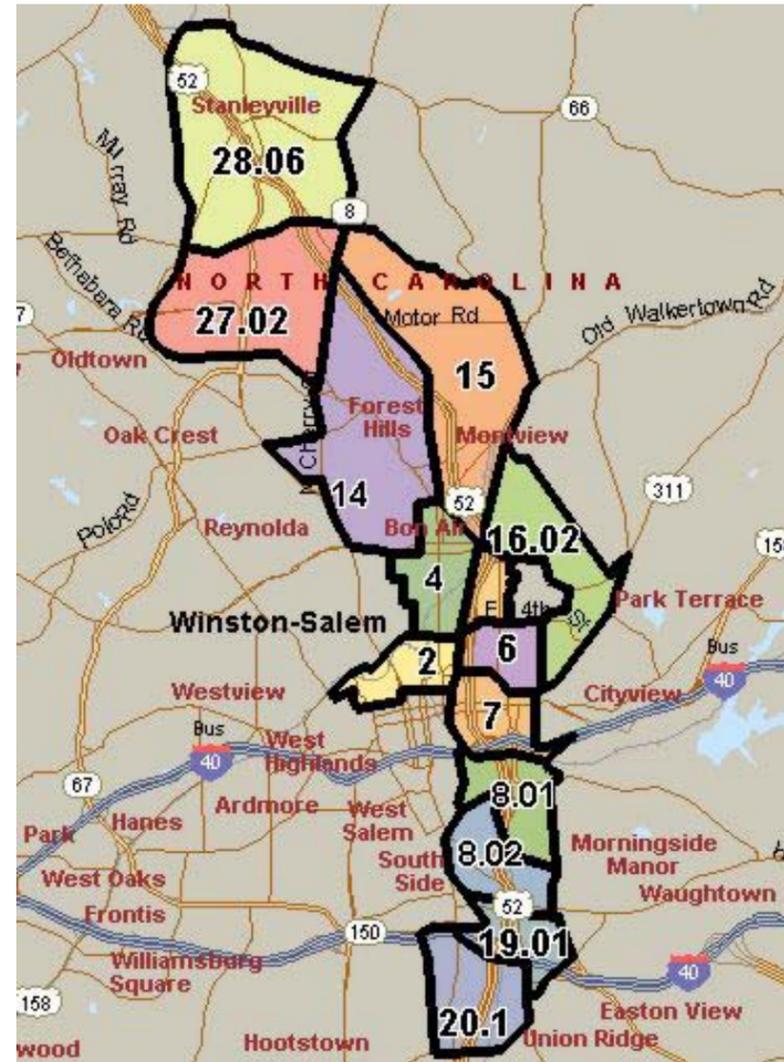


Table 6-13. Demographics at a Glance, Convenience Goods Trade Area, 2001

General		Population by Age	
Population, 2001	41,633	under 20	29.20%
Population Change, 1990-2001	5.40%	20-39	30.80%
Households, 2001	16,925	40-64	26.80%
Household Change, 1990-2001	8.40%	65 and older	13.30%
Avg. Household Size	2.29	Median Age (in years)	33.8 yrs.

Population by Ethnicity		Income Characteristics	
Black (non-Hispanic)	65.50%	Per Capita Income	\$14,690
White (non-Hispanic)	21.70%	% of Winston-Salem average	60%
Hispanic	11.60%	Average Household Income	\$34,852
Other	1.20%	% of Winston-Salem average	62%

Source: Claritas, Inc.

The trade area as pictured extends from the Stanleyville area near Rural Hall at its northern reaches, to south of Interstate 40 (at the US 52 interchange with Clemmonsville Road). Many neighborhoods are included in this area, such as Forest Hills, North Winston, East Winston, the city’s downtown, parts of Waughtown, and many others.

Population of the Convenience Goods Trade Area

To begin to determine the extent of demand for convenience goods and personal services, one needs to examine the demographics of the residents who live within the trade area. Table 6-13 gives a brief summary of the demographics of residents within this area.

As shown, the Corridor-wide Convenience Goods Trade Area is comprised largely of black residents (making up about two-thirds percent of the population), with approximately 22 percent of the population being white, and about 12 percent being Hispanic. The average household size is 2.29 persons, slightly higher than the citywide average of 2.23 and Forsyth County’s average of 2.37 persons. Over the past decade, the population of the trade area has increased by 5.4 percent – a modest growth rate in Forsyth County, where the overall population growth over the same period exceeded 16 percent. But this growth has been a reversal of the 1980-1990 period, during which time the area’s population *declined* by 7.3 percent.

The Trade Area’s age distribution is skewed younger than in most Triad communities, with a median age of 33.8 years, as compared to 36.6 years for the City of Winston-Salem, and 37.7 years for Forsyth County.

Table 6-14. Population Projection, Convenience Goods Trade Area, 2020

	Population	Households
Population, 2001	41,633	16,925
Projected % Increase by 2020	28%	37%
Projected Population, 2020	53,290	23,260

Sources: Claritas, Inc., North Carolina State Data Center, and Hammer, Siler, George Associates.

As stated earlier, Forsyth County's population is projected to increase by 28 percent between 2001 and 2020, when the US 52 Corridor project is slated for completion. The population of the Trade Area being examined here will likely increase at a similar rate; the area's status as a redevelopment area, and the relative abundance of developable residential (particularly multifamily residential) parcels) points to a period of new housing construction and resultantly a growing population within the coming years. Table 6-14 shows this projected local-area population increase through 2020.

As shown, it is projected that by 2020, the Trade Area will contain approximately 53,290 people, an increase of 28 percent from the area's 2001 population base. An increase in the number of households is factored at a higher rate of 37 percent due to continued trends of decreasing family size; this results in a projection slightly over 23,000 households.

Table 6-15: Total Expenditure Potential, Convenience Goods Trade Area, 2001 and 2020

	2001	2020
Number of Households	16,925	23,260
Average Household Income	\$34,852	\$37,000
Total Expenditure Potential	\$589,900,000	\$860,600,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

Table 6-16: Convenience Goods Expenditure Potential, 2001 and 2020

	2001	2020
Total Expenditure Potential	\$589,900,000	\$860,600,000
% Spent on Convenience Goods	20.10%	20.10%
Convenience Goods Expenditure Potential	\$118,600,000	\$173,000,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

As indicated, the roughly 17,000 households of the Convenience Goods Trade Area generate an annual expenditure potential of about \$590 million – this figure is projected to increase to \$860 million by 2020. Of course, only a portion of this total income generation is spent on the types of convenience goods and personal services being measured in this section of the report. For the purposes of this analysis, it is estimated by the U.S. Bureau of Labor Statistics and Hammer, Siler, George Associates that 20.1 percent of the area's total expenditure potential is spent on everyday convenience goods and personal services. Table 6-16 below shows the derived *Convenience Goods Expenditure Potential* for the trade area.

As shown, based on the total expenditure potential of about \$590 million, there is calculated to be approximately \$118.6 million currently spent each year on Convenience Goods by residents of the trade area. By 2020, that figure is projected to increase to about \$173 million annually, due to the increased population and expenditure potential.

The average household income within the Convenience Goods trade area of \$34,852 is less than two-thirds of the average household income for Winston-Salem as a whole. A similar difference exists with per capita income, where the trade area average of \$14,690 is just 60 percent of Winston-Salem's average of \$24,440 – and is 56 percent of the County's average of \$26,165.

Convenience Goods Trade Area Expenditure Potential

A first step in the analysis of retail trade opportunities is measuring a given area's current expenditure potential. This is achieved by multiplying the number of households in the area by the average annual household income. For ease of comparison, estimates of future household income are kept in 2001 constant dollars throughout this report. It is estimated that average household income will increase in the area by approximately six percent, resulting in a projected annual income of about \$37,000 by 2020. The results of these calculations for the Convenience Goods Trade Area are shown below.

Table 6-17: Convenience Goods Trade Area Annual Consumer Demand, 2001 and 2020

	2001	2020
Convenience Goods Expenditure Potential	\$118,600,000	\$173,000,000
Trade Area Capture Rate	70%	70%
Trade Area Consumer Demand	\$83,000,000	\$121,100,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

The above figures (of \$118.6 million in current expenditure potential and \$173 million in future potential) represent all convenience goods purchased by residents of the Corridor area, regardless of whether those goods are bought within the immediate area, or in a neighborhood some distance away.

As stated earlier, the Convenience Goods Trade Area was defined as a band of Census Tracts surrounding US 52 because the majority of convenience goods purchases are made near where the customers reside. Therefore, in this analysis, it is calculated that 70 percent of the area's convenience goods expenditure potential is spent at retail establishments within the trade area itself. This is calculated into an amount in Table 6-17.

Based on the above calculations, the current consumer demand for Convenience Goods from the trade area is approximately \$83 million annually, and by 2020 this yearly demand is projected to exceed \$121 million for the area.

Competition Analysis

In order to look at future demand, it is first important to look at the existing retail competition in the area. Currently, there are many retail stores, and several larger retail nodes, that currently exist within the Convenience Goods Trade Area. For the purposes of this analysis, four types of retail/service establishments are being examined in detail. These include:

- **Food Stores:** Stores selling non-prepared foods, groceries, bakeries, and markets specializing in meats, fish, fruits, vegetables, confectioneries, and other food products.
- **Drug Stores:** A place of business selling prescription and/or non-prescription drugs, as well as cosmetics, stationery, cigarettes, and other proprietaries.
- **Barber/Beauty Shops:** Establishments engaged in hair cutting, hairdressing, manicuring, or other personal cosmetic treatments.
- **Laundry Services:** Establishments engaged in the cleaning of clothes or linens. Includes dry cleaners as well as coin-operated laundrettes.

Table 6-18: Food Stores within US 52 Corridor Convenience Goods Trade Area

Type of Store	Total # of Stores	# of Stores with 20 or More Employees	Estimated Annual Sales
Grocery Stores	44	3	\$63,000,000
Meat & Fish Markets	6	0	\$5,700,000
Retail Bakeries	4	2	\$7,700,000
Produce Markets	3	0	\$3,600,000
Miscellaneous Food Stores	4	0	\$2,600,000
Total	61	5	\$82,600,000

Source: Claritas, Inc.

Existing Stores: The largest portion of sales in the Convenience Goods category comes from food stores, which includes supermarkets, groceries, meat markets, produce markets, and other specialty food vendors.

According to Claritas, Inc., a retail and demographics research firm, there are currently 61 food stores within the Corridor-wide Convenience Goods Trade Area. A breakdown of these stores is shown below.

Of the 61 total food stores within the trade area, more than two-thirds (or 44 stores) are classified as general grocery stores, with the remainder being specialty

Table 6-19. Drug Stores and Personal Services Establishments within US 52 Corridor Convenience Goods Trade Area

Type of Store	Total # of Stores	# of Stores with 20 or More Employees	Estimated Annual Sales
Drug Stores	2	0	\$3,600,000
Laundry Services	19	1	\$6,400,000
Barber/Beauty Shops	83	0	\$9,200,000
Total	104	1	\$19,200,000

Source: Claritas, Inc.

Table 6-20. Total Estimated Current Retail Competition in Convenience Goods Trade Area

Type of Store	# of Stores	Estimated Annual Sales
Food Stores	61	\$82,600,000
Drug Stores & Personal Services	104	\$19,200,000
Total Convenience Goods Sales	165	\$101,800,000

Source: Claritas, Inc.

Trade Area, there are over 160 establishments providing goods or services that fall within the definition of convenience goods. About 60 of these establishments are food stores, while over 100 are drug stores/personal services establishments. Table 6-20 shows that the trade area sales of convenience goods and personal services equal approximately \$101.8 million per year.

Table 6-21. Total Projected Consumer Demand, Convenience Goods Trade Area, 2020

Trade Area Projected Consumer Demand, 2020	\$121,100,000
Estimated Inflow Sales @ 30% of Above	\$36,300,000
Total Projected Consumer Demand, 2020	\$157,400,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

annually. It is additionally projected that in 2020, inflow sales for convenience goods will be approximately 30 percent of trade area consumer demand.

Table 6-22. Convenience Goods Trade Area, Analysis of Annual Demand

Total Projected Consumer Demand	\$157,400,000
Total Estimated Trade Area Sales, 2001	\$101,800,000
Unmet Consumer Demand	\$55,600,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

or miscellaneous food stores. Three of the 44 groceries (and two of the area's retail bakeries) are listed as having 20 or more employees, a measure that indicates a larger retail establishment. In total, it is estimated that over \$82 million in annual sales are generated by the food stores within the Convenience Goods trade area as a result of trade area support and inflow.

Other portions of the convenience goods market come from drug stores, as well as from services such as laundry services and personal cosmetic services. Table 6-19 below shows the breakdown of these establishments within the Convenience Goods Trade Area.

As shown, there are just two drug stores identified by Claritas, as well as 19 laundry establishments, and over 80 barber/beauty shops within the trade area. Taken together, these establishments account for over \$19 million in estimated annual sales.

Throughout the Corridor-wide Convenience Goods Trade Area, there are over 160 establishments providing goods or services that fall within the definition of convenience goods. About 60 of these establishments are food stores, while over 100 are drug stores/personal services establishments. Table 6-20 shows that the trade area sales of convenience goods and personal services equal approximately \$101.8 million per year.

Unmet Demand

A positive gap between the demand generated by the Trade Area residents and the sales generated by the Trade Area's existing establishments would indicate an unmet demand – meaning that additional retail services could be supported by the Trade Area's residents. As shown previously, it is projected that total consumer goods demand in 2020 from residents within the trade area will be about \$121 million annually. It is additionally projected that in 2020, inflow sales for convenience goods will be approximately 30 percent of trade area consumer demand.

Table 6-21 shows that it is estimated that in 2020 there will be approximately \$157 million per year in total demand for convenience goods and personal services within the corridor trade area.

The following tables address how much of an unmet demand would exist in the area given the population and expenditure projections for 2020. In other words,

within the next two decades, how much new convenience retail will be demanded within the trade area? This is shown in Table 6-22.

As shown, there is approximately \$56 million in unmet annual demand between the Trade Area's projected 2020 consumer demand and the area's existing annual sales from convenience goods/personal services establishments. Put another way, residents' 2020 demands will exceed the area's current sales by about \$56 million per year.

Table 6-23. Projected Additional Supportable Retail Space, Convenience Goods Trade Area, 2020

Projected Unmet Consumer Demand, 2020	\$55,600,000
Average Sales per Square Foot	\$350
Est. Supportable Retail Space	159,000 Sq. Ft.

Note: Figures presented in 2001 constant dollars.

Source: Hammer, Siler, George Associates.

This represents enough of an amount of unmet demand to justify future development of retail establishments offering convenience goods or personal services within the US 52 Corridor area. To gauge the extent of new retail space that could be supported by this unmet demand, it is necessary to look at how much sales per square foot typical consumer goods retail establishments achieve.

As a general measure, such retail establishments average approximately \$350 per square foot. Table 6-23 shows how this translates into an amount of supportable retail square feet.

Conclusions on the Development of Convenience Goods Retail

As shown above, there appears to be some demand for some new convenience goods retail space (with an unmet retail demand of \$55.6 million). This assessment suggests that this level of demand for convenience goods retail goods translates into a support for approximately 159,000 square feet of additional retail space within the Convenience Goods Trade Area.

6.5.2.2 Value-Oriented Retailing

Another potential retail development opportunity in the US 52 Corridor is that of value-oriented retailing. "Value-oriented" is the name given to large-scale stand-alone retail enterprises of at least 30,000 square feet that compete for market share based upon value and selection of product. This retail concept, sometimes known as big box retailing, typically sells specific types of shoppers' goods (apparel, home furnishings, building materials, electronics), or a combination of shoppers' goods and general merchandise store retail items.

Value-oriented, or big box, retailers look for certain site attributes for their store locations. Among these attributes are:

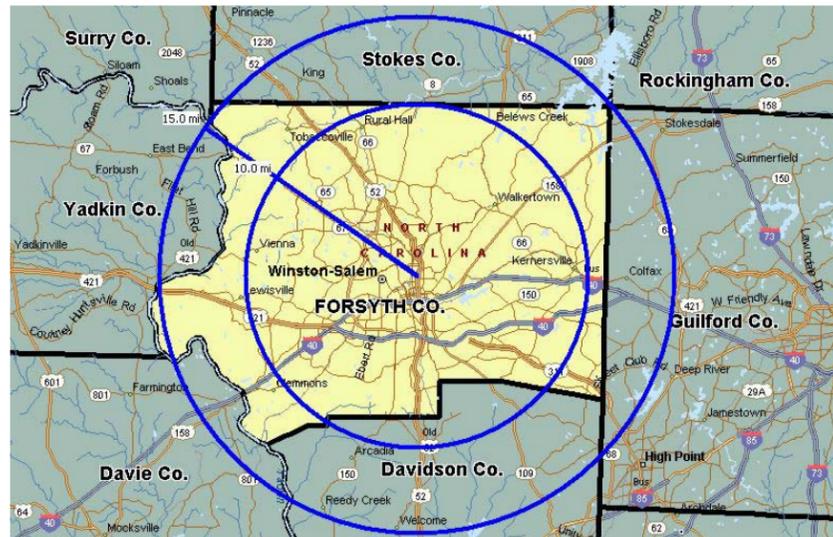
- 1) Large and flat parcels appropriate for the structure itself, and for necessary parking, with a high floor-to-area ratio.
- 2) Convenience and centrality to a large consumer base. These stores have trade areas that are large – often 15 miles or more, so being in the center of a consumer base is preferable to being on a consumer periphery.
- 3) Adequate transportation infrastructure to facilitate ingress and egress from the retail site, particularly during heavy shopping days.
- 4) Adequate demand from the region's trade area to support further retail development.

The first three criteria above can be satisfied by a location within the US 52 Corridor. This is particularly true of the downtown portion of the Corridor, which has an abundant supply of larger industrial parcels that, given zoning approval, would be suitable for large-scale retail development. As such, a value-oriented retail location along the Corridor would offer the following advantages:

- **Available sites in an area that is already fully developed.** There would be less opposition to large-scale retail development than there would be in less developed portions of the County where neighbors often oppose such development on the grounds that it does not positively impact surrounding neighborhoods.
- **A central location within the County.** A downtown location is not only central to City residents, but is also central to the rapidly growing suburban areas north, south and east of Winston-Salem. In addition, a downtown location would be within a reasonable drive of residents from other counties, such as Davidson and Stokes, where the retailing opportunities are not as vast as in Forsyth County.
- **Improved highway infrastructure.** The upgrading of US 52 to interstate standards will mean greatly improved transportation infrastructure, making for fluid entry and exit from parcels alongside the highway.

That said, there needs to be adequate demand from the area's consumers to justify increased retail development. For this assignment, Hammer, Siler, George Associates has examined the income and expenditure characteristics of the area's residents to determine whether there will be sufficient demand in the coming years to justify enhanced retailing within the Corridor.

Map 6-2. Forsyth County and Radii from Downtown US 52 Corridor



Value-Oriented Retailing Trade Area

Consumers will travel a relatively long distance for the types of goods offered by value-oriented or big box retailers. For typical big box goods such as apparel, home furnishings, building materials and electronics, there is typically a high degree of engagement in comparison shopping, and consumers tend to patronize establishments that offer the best combination of price and selection, even if that means foregoing a competing store that may be closer in proximity. Therefore, the trade area for a big box store is relatively large – often measured at 15 miles. A 15-mile radius from the downtown portion of the US 52 Corridor is roughly coextensive with the boundaries of Forsyth

County; thus for the purposes of this report, Forsyth County itself is considered to be the Value-Oriented Retailing Trade Area. A map of the county is shown as Map 6-2, along with 10-mile and 15-mile radii from the center of the downtown portion of the US 52 Corridor.

Population of Forsyth County

To begin determining the extent of demand for value-oriented retail goods, one needs to examine the current demographics of the residents within the trade area, which in this instance is Forsyth County itself. Table 6-24 below gives a brief summary of the demographics of residents within the county, as well as the county's recent growth statistics.

Forsyth County has a demographic structure that is more representative of the State of North Carolina as a whole than is the smaller local area analyzed above as the US 52 Corridor Convenience Goods Trade Area. From an ethnic standpoint, the County is comprised of approximately two-thirds white residents and one-quarter black residents, with the remainder being Hispanic or other ethnicities. The County's average household size of 2.37 is larger than the local area's household size of 2.20, but smaller than the statewide average of 2.52. Since 1990, the population of Forsyth County has increased by 16.4 percent – a relatively rapid rate of growth, but still less than North Carolina's total growth rate of 23 percent over the same period. Much of the growth within the county has come from the suburban fringes of Winston-Salem and from rapidly

Table 6-24. Demographics at a Glance, Forsyth County, 2001

General		Population by Age	
Population, 2001	309,351	under 20	25.90%
Population Change, 1990-2001	16.40%	20-39	27.80%
Households	126,788	40-64	33.20%
Household Change, 1990-2001	18.00%	65 and older	13.10%
Avg. Household Size	2.37	Median Age (in years)	37.7 yrs.
Population by Ethnicity		Income Characteristics	
White (non-Hispanic)	66.20%	Per Capita Income	\$26,165
Black (non-Hispanic)	25.40%	% of North Carolina average	120%
Hispanic	6.70%	Average Household Income	\$63,283
Other	1.70%	% of North Carolina average	102%

Source: Claritas, Inc.

growing areas such as Kernersville, with comparatively little growth having come from the older urban neighborhoods of Winston-Salem.

The County's age distribution is slightly older than in the local area defined earlier, with a median age of 37.7 years, compared to 33.8 years for the area immediately surrounding the downtown Corridor. As a result, only 25.9 percent of Forsyth County residents are under 20 years of age, as compared to 29.2 for the Corridor area, and 26.7 percent for the State average. The national average for residents under the age of 20 is 28.2 percent

Table 6-25. Population Projection, Forsyth County, 2020

	Population	Households
Population, 2001	309,351	126,788
Projected % Increase by 2020	28%	38%
Projected Population, 2020	391,125	174,388

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

family sizes than is typical for the state.

Forsyth County is projected to increase in population by 28 percent between 2001 and 2020, at which time the US 52 corridor project is slated for completion. Table 6-25 shows this projected county-wide population increase.

As shown, it is projected that by 2020, Forsyth County will contain approximately 391,000 people, an increase of 28 percent from the county's 2001 population base. An increase in the number of households is factored at a higher rate of 38 percent due to continued trends of decreasing family size; this results in a projection slightly under 175,000 households.

Table 6-26. Total Expenditure Potential, Forsyth County, 2001 and 2020

	2001	2020
Number of Households	126,788	174,388
Average Household Income	\$63,283	\$65,000
Total Expenditure Potential	\$8,023,500,000	\$11,335,200,000

Note: Figures presented in 2001 constant dollars.
Sources: Claritas, Inc. and Hammer, Siler, George Associates.

2001 constant dollars throughout this report. It is estimated that average annual household income will increase slightly to about \$65,000 in Forsyth County by 2020. The results of these calculations are shown below.

As indicated, the County's 126,788 residents currently generate an annual expenditure potential of about \$8 billion – this figure is projected to increase beyond \$11 billion by 2020. Since only a small portion of this total income generation is spent on the types of goods offered by value-oriented retailers, one needs to estimate the average proportion of income spent on such products.

For the purposes of this analysis, value-oriented retailing is broken down into four general categories, described below:

- **General Merchandise:** A store selling a wide variety of merchandise for home consumption. General merchandise stores sell items ranging from apparel, sporting goods, automotive products, household supplies and more. Stores include Wal-Mart, Target, Kmart, Sam's Club, and others.

Table 6-27. Value-Oriented Store Categories and Average Expenditures of Total Personal Income (TPI)

Category	% of TPI
General Merchandise	6.20%
Apparel and Accessories	2.60%
Furniture, Furnishings, etc.	1.90%
Hardware/Building Materials	2.10%
Electronics	1.10%
Others	1.10%
Total	15.00%

Source: Hammer, Siler, George Associates.

- **Hardware/Building Material Stores:** Stores selling hardware and building materials supplies, including lumber, paint, glass, plumbing supplies, electrical supplies, and lawn/garden supplies. Stores include Home Depot, Lowe's, etc.
- **Electronics Stores:** Retailers of consumer electronics such as radios, televisions, computers, software, and prerecorded music. Stores include Circuit City, Best Buy, and others.
- **Home Furnishing Stores:** Establishments selling furniture, fixtures, floor coverings, household appliances, or other such articles. Includes stores such as IKEA, Ethan Allen, (neither of which has a presence in the Triad), Rooms To Go, and miscellaneous furnishings stores such as Bed Bath & Beyond.

Hammer, Siler, George Associates estimates that consumers spend on average 15 percent of their total personal income on goods sold at such establishments. This is separated into the following major store categories, shown in Table 6-27 at left.

Value-Oriented Retail Trade Area Expenditure Potential

As with the more localized Convenience Goods retail analysis above, to begin looking at opportunities for developing expanded value-oriented retailing, one must measure the trade area's expenditure potential (which, in this instance, is Forsyth County's expenditure potential). This is achieved by multiplying the number of households in the area by the average annual household income. For ease of comparison, estimates of future household income are kept in

Table 6-28. Value-Oriented Merchandise Expenditure Potential, 2001 and 2020

	2001	2020
Total Expenditure Potential	\$8,023,500,000	\$11,335,200,000
% Spent on Value-Oriented Merchandise	15.00%	15.00%
Value-Oriented Merchandise Expenditure Potential	\$1,203,500,000	\$1,700,300,000

Note: Figures presented in 2001 constant dollars.
Sources: Claritas, Inc. and Hammer, Siler, George Associates.

It should be noted that these categories are not necessarily mutually exclusive. The broad "general merchandise" category encompasses a wide array of shoppers' goods including portions of the remaining four categories.

Taking the above percentages into consideration, Table 6-28 compares these figures to the County's total expenditure potential, and shows the Value-Oriented Merchandise Expenditure Potential for Forsyth County.

As shown, based on the total expenditure potential of about \$8 billion, there is calculated to be approximately \$1.2 billion spent annually on value-oriented merchandise by Forsyth County residents. By 2020, that figure is projected to increase to about \$1.7 billion annually, due to the increased population and expenditure potential.

Value-Oriented Retailing Capture Rate

The above figure of \$1.7 billion represents all value-oriented merchandise purchases by Forsyth County residents, regardless of whether those goods are bought within the County or elsewhere.

Table 6-29. Forsyth County Annual Consumer Demand for Value-Oriented Merchandise, 2001 and 2020

	2001	2020
Value-Oriented Merchandise Expenditure Potential	\$1,203,500,000	\$1,700,300,000
County Capture Rate	75.00%	75.00%
County Consumer Demand	\$902,600,000	\$1,275,200,000

Note: Figures presented in 2001 constant dollars.
Sources: Claritas, Inc. and Hammer, Siler, George Associates.

As stated earlier, the trade area for value-oriented retailing has been established to be Forsyth County because it is estimated that most purchases of such goods by county residents are made within the county itself. The reader should be advised that this capture rate is for *value-oriented merchandise* – being the types of merchandise sold by these retailers, not necessarily limited to those goods purchased within any particular type of store. The reason for this is that competition for consumers comes from all stores offering similar wares; for example, competition for big box stores comes not only from other big boxes but also from department stores, shopping malls, and other franchise and independent stores. Increasingly, competition also comes from non-store retailers (Internet and mail-order firms), particularly for apparel and electronics.

Therefore, in this analysis, it is calculated that 75 percent of Forsyth County residents' expenditure potential for value-oriented merchandise is spent at retail establishments within the County (with the remainder purchased in other counties or at non-store retailers). This percentage is calculated into a dollar amount below.

Table 6-30. Select Value-Oriented Retailers, Forsyth County

General Merchandise	
Costco	Hanes Mall Blvd.
Kmart	Peters Creek Pkwy.; Clemmons
Kohl's (2)	Hanes Mall Blvd.; Kernersville
Office Depot (2)	Silas Creek Pkwy.; University Pkwy.
Sam's Club	Hanes Mall Blvd.
Staples (3)	Hanes Mill Rd.; Kernersville; Clemmons
Target (2)	Hanes Mall Blvd.; University Pkwy
Wal-Mart (3)	E. Hanes Mill Rd.; Kester Mill Rd.; Kernersville
Building Materials	
Home Depot (2)	Hanes Mall Blvd.; University Pkwy.
Lowe's (3)	Hanes Mall Blvd.; University Pkwy.; Kernersville
Electronics	
Circuit City	Hanes Mall Blvd.
Best Buy	Griffith Rd.
Home Furnishings	
Bed Bath & Beyond	S. Stratford Rd.
Rhodes Furniture	Hanes Mall Blvd.

Source: Hammer, Siler, George Associates.

Table 6-31. Total Estimated Value-Oriented Retail Competition in Forsyth County by Store Type

Type of Store	Total # of Stores	# of Stores with 20 or More Employees	Estimated Annual Sales
General Merchandise	53	21	\$320,500,000
Electronics and Computers	145	10	\$259,700,000
Home Furnishings and Appliances	182	17	\$223,800,000
Apparel and Accessories	235	14	\$140,400,000
Building Materials and Hardware	45	6	\$106,100,000
Other	246	13	\$152,800,000
Total	906	81	\$1,203,300,000

Source: Claritas, Inc.

Based on the above calculations, the current consumer demand for value-oriented merchandise from Forsyth County is approximately \$902.6 million annually, and by 2020 this demand is projected to reach beyond \$1.2 billion for the County.

Competition Analysis

There are many existing value-oriented retailers, shopping malls, and other retail stores within the county-wide trade area. To give an indication as to some of the existing competition for sales of such merchandise, Table 6-30 presents some existing stores that sell value-oriented merchandise in Forsyth County.

Existing Stores: According to Claritas, Inc., a retail and demographics research firm, there are currently 906 stores that offer value-oriented merchandise within Forsyth County. Again, it should be noted that these include all stores that sell such merchandise, not just big box retailers or any other specific type of store. A breakdown of these stores is shown below.

As shown, the estimated 906 stores that sell value-oriented merchandise within the county account for over \$1.2 billion in estimated annual sales. The largest portion of these sales comes from general merchandise stores (\$320.5 million), followed by electronics and computer stores (\$259.7 million), and by home furnishings and appliances stores (\$223.8 million). These three categories themselves account for \$804 million in estimated annual sales, or two-thirds of the total.

This high amount of sales within Forsyth County points to the fact that many retailers in the area have large sales volumes and draw from a wide area. Of the 906 total stores identified by Claritas, 81 of them (over 9 percent) have 20 or more employees.

Table 6-32. Total Projected Consumer Demand, Value-Oriented Merchandise, 2020

County Projected Consumer Demand, 2020	\$1,275,200,000
Estimated Inflow Sales @ 25% of Above	\$318,800,000
Total Projected Consumer Demand, 2020	\$1,594,000,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

Table 6-33. Forsyth County, Analysis of Annual Value-Oriented Merchandise Demand

County Projected Consumer Demand, 2020	\$1,594,000,000
Total Estimated County Value-Oriented Sales, 2001	\$1,203,300,000
Unmet Consumer Demand	\$390,700,000

Note: Figures presented in 2001 constant dollars.

Sources: Claritas, Inc. and Hammer, Siler, George Associates.

Table 6-34. Projected Additional Supportable Value-Oriented Retail Space, Forsyth County, 2020

Projected Unmet Consumer Demand, 2020	\$390,700,000
Average Sales per Square Foot	\$400
Est. Supportable Retail Space	977,000 Sq. Ft.

Note: Figures presented in 2001 constant dollars.

Source: Hammer, Siler, George Associates.

This represents a substantial amount of unmet demand – enough to justify future development of value-oriented retailers within the county as a whole. To gauge the extent of new retail space that could be supported by this unmet demand, one must look at what amount of sales are usually generated per square foot of big box-type retail space.

As a general measure, value-oriented retailers such as big box stores achieve approximately \$400 per square foot in sales per year. Table 6-34 left shows how this translates into an amount of supportable square feet.

As shown above, it is calculated that there will be significant demand for new value-oriented retail space between now and 2020, given the projected increases in Forsyth County's population and expenditure potential. This assessment suggests that this level of demand for such retail goods translates into potential support for approximately 977,000 square feet of retail space.

Unmet Demand

A positive gap between the demand generated by Forsyth County residents and the sales generated by the county's existing establishments would indicate an unmet demand – meaning that more value-oriented retail services could be supported by the area's residents. As shown previously, it is projected that the total demand for value-oriented merchandise from county residents in 2020 will be about \$1.275 billion per year. It is additionally projected that in 2020, inflow sales for this type of merchandise will be approximately 25 percent of County residents' consumer demand.

The following tables address how much of an unmet demand would exist in the county given the population and expenditure projections for 2020. In other words, within the next two decades, how much new big box-type retail space will be demanded within the trade area? This is shown in Table 6-33 below.

As shown, there is approximately \$391 million in annual unmet demand between Forsyth County's projected 2020 consumer demand and the county's existing annual sales from value-oriented retailers. Put another way, residents' 2020 demands will exceed the county's current sales by about \$391 million per year.

Table 6-35. Estimated Demand for Square Footage in Value-Oriented Retail, US 52 Corridor, 2020

Est. Demand in Sq. Ft. Forsyth Co.	Est. Corridor Capture Rate	Est. Demand in Acres US 52 Corridor
977,000 Sq. Ft.	20%	195,000 Sq. Ft.

Source: Hammer, Siler, George Associates.

development potential. This Corridor square footage demand is shown in the following table.

Conclusions on the Development of Value-Oriented Retail

Table 6-36. Project Retail Demand in Square Footage, US 52 Corridor, 2020

Convenience Goods & Personal Services	159,000 Sq. Ft.
Value-Oriented Retail	195,000 Sq. Ft.
Est. Supportable Retail Space	354,000 Sq. Ft.

Note: Figures presented in 2001 constant dollars.

Source: Hammer, Siler, George Associates.

6.5.2.3 Total Retail Demand, Both Categories

The preceding section shows that the next two decades will see the emergence of significant demand for the two categories of retail services examined in this report – those of convenience goods and of value-oriented merchandise. This growth comes from both the projected increase in Forsyth County’s population, and from the corresponding increase in expenditure potential.

Table 6-36 summarizes the US 52 Corridor’s projected retail demand in terms of square footage for both categories of retail services examined above.

As shown, between the two types of retail, there is projected to be a demand within the corridor for approximately 354,000 square feet of retail space by 2020.

6.5.3 Residential Market Assessment

The focus of a housing development strategy is to stabilize both public and private housing in the US 52 Corridor communities. In this context, the work of the redevelopment effort will focus on existing neighborhoods that require some form of intervention for stabilization and partnering with the Winston-Salem Housing Authority when the need exists to improve housing conditions.

However, given the absence of city resources to control the land required to begin land assembly and housing production, we have limited this analysis to a projection of demand based upon the Corridor’s share of the projected County population growth. There are many additional sections that could not be evaluated due to limited resources.

Should the City acquire the necessary resources to begin the land assembly process, we would suggest a more extensive market study containing components such as a consumer survey and focus groups that have not been included as parts of this assessment.

Capture Rate for US 52 Corridor

The above figure of 977,000 square feet in demand for value-oriented retail is based on county-wide totals. Clearly, the Corridor area being examined in this report will be able to capture only a portion of this county total. The US 52 Corridor, being centrally located with adequate infrastructure and an abundance of developable sites, will be competitive with other parts of the county in terms of retail site locations. It is estimated that the Corridor area can capture approximately 20 percent of Forsyth County’s value-oriented retail

As shown, the above calculations and projections point to a sizable demand for value-oriented retail space – both in Forsyth County overall and within the US 52 Corridor area specifically – between now and 2020. By capturing 20 percent of the County’s overall demand for such space, the Corridor is projected to demand about 195,000 square feet in retail space – or about five individual stores that are sized at around 40,000 square feet.

Table 6-37. Projected Increase in Households, Corridor Area, 2001-2020

	Low Range	High Range
Approx. Projected Increase in Population, 2001-2020	11,700	11,700
Average Household Size	229%	206%
Est. Projected Increase in Households, 2001-2020	5,100	5,700

Sources: Claritas, Inc., North Carolina State Data Center, and Hammer, Siler, George Associates.

6.5.3.1 Housing Market Potential

To gauge the potential demand for housing within the Corridor, one needs to examine the projected rates of increase for Forsyth County’s population and for the number of households. Overall, the County’s population is projected to increase to approximately 391,000 persons by 2020 – an increase of 28 percent from the county’s 2001 population estimate. With the US 52 Corridor’s centrality and the abundance of developable residential land, it is estimated that the Corridor can achieve similar population growth.

Table 6-38. Estimated New Housing Demand, US 52 Corridor, 2001-2020

	Low Range	High Range
Est. Projected Increase in Households, 2001-2020	5,100	5,700
Est. # of Housing Unit Rehabilitations	200	200
Est. # of Housing Unit Conversions	300	300
Est. # of New Housing Demand	4,600	5,200

Sources: Claritas, Inc., North Carolina State Data Center, and Hammer, Siler, George Associates.

One major variable in the demand for housing will be the composition of those households that move into the Corridor area. If the area continues to attract black and Hispanic households, as some developers have suggested, the area’s average household size will likely be larger. However, if the northern sectors of the Corridor and the downtown portion attract a relatively large share of white householders (particularly singles in multifamily units), then the average household size will be smaller. Table 6-37 examines the projected population increase in the Corridor area with a range of average household sizes.

As shown, it is projected that between 5,100 and 5,700 households will be added to the population base of the Corridor area by 2020. This points to potential demand of upwards of 5,000 housing units in the Corridor area in the next two decades. Most of this demand will be met by new housing construction, although with an existing housing unit vacancy rate of approximately 11 percent, a small portion of this demand can be met through housing rehabilitation, and also through the conversion of nonresidential properties, primarily in the downtown portion of the Corridor. The calculation of this is shown below.

Based on the above calculation, between 4,600 and 5,200 new housing units could be demanded within the US 52 Corridor, given a rate of population growth consistent with projected County averages.

6.5.3.2 Target For-Sale Market

The primary target demographic for housing in the US 52 Corridor is black, Hispanic, and white householders with average annual household incomes of \$20,000 to \$50,000 in current dollars. Although the target market householders would be coming from a variety of housing backgrounds, the most likely group of individuals to be attracted to the US 52 Corridor would be those in these income categories adjusted for inflation.

Table 6-40. Hotel Room Night Supply, Demand and Occupancy, Forsyth County, 2000-2002

	2000	2001	2002	Avg.
Total Room Night Supply	1,685,383	1,720,158	1,743,705	1,716,415
Total Room Night Demand	915,501	910,228	892,343	906,024
Annual Occupancy Rate	54.30%	52.90%	51.20%	52.80%

Note: 2002 figure averaged from statistics from first ten months of year.
Source: Smith Travel Research and Hammer, Siler, George Associates.

Room rates, meanwhile, have held relatively steady over the past three years. Currently, the average room rate in Forsyth County is \$64.37, almost identical to what the average room rate was at the same time in 1999. Individual rates vary substantially, reflecting the diversity of product offerings in the Triad hotel market.

In terms of statistical analyses, a valuable measure of the current state of the hotel market is to look at the past three years averaged together. This gives a more balanced picture of the market, and also removes the fluctuations inherent in single-year statistics, particularly concerning the effects of the 2001 terrorist attacks. Table 6-40 shows the most recent three

Table 6-41. Difference between 3-Yr. Average Room Night Demand and Ideal Demand for Current Space, Forsyth County

Demand	Room Night Supply	Occupancy Rate	Room Night Demand
3-year Average	1,716,415	52.80%	906,024
Ideal Demand Based on Current Supply	1,716,415	65.00%	1,115,670
Difference (Excess Demand)			209,646

Source: Smith Travel Research and Hammer, Siler, George Associates.

years in terms of room night occupancy statistics, and the average of those three years (note that the following tables measure *room nights*, defined as the total number of rooms made available over the course of a year).

Current short-term demand for hotel rooms in Forsyth County is relatively weak, as indicated by occupancy rates, which are shown above to be around 53 percent. This weak demand is further exacerbated by average room rates that have not been increasing in recent years. The increase in the supply of hotel rooms, along with a lack of increased demand, has resulted in a relatively soft hotel market that cannot at this time, support additional hotel facilities.

To put the above figures in perspective, the ideal average annual occupancy rate for such a hotel market is approximately 65 percent of total room night supply. Table 6-41 shows, based on the above three-year average, the current oversupply in room nights within the County.

As shown, there is currently an excess supply of just over 200,000 room nights per year, pointing to a market that is essentially in equilibrium. However, this situation is not expected to remain in equilibrium beyond the short term. By the time the US 52 Corridor project is completed, there will be an increased demand for hotel space – some of which would likely be directed towards the corridor itself.

Projected Future Demand

Table 6-42. Employment Projections by Sector to 2020, Forsyth County

Sector	2000 Employee Estimate	Average Annual Growth	2020 Employee Projection
Services	58,211	2.11%	88,383
Retail Trade	31,951	1.42%	42,360
Manufacturing	31,461	0.44%	34,348
Government	17,123	0.97%	20,770
Finance, Ins., R.E.	13,875	2.09%	20,984
Transportation	9,228	1.83%	10,887
Construction	9,177	0.76%	10,677
Wholesale Trade	7,519	0.88%	8,959
Communications & Utilities	1,891	1.00%	2,307
Agriculture Services	889	-1.11%	711
Mining	242	0.00%	242
Total	181,567	1.38%	240,628

Sources: Employment Security Commission of North Carolina and Hammer, Siler, George Associates.

growth rates from these shorter-term projections were applied to the longer-term period to 2020 – the results are shown in Table 6-42, disaggregated by major industrial sector.

Table 6-43. Low and High Estimates, Forsyth County Projected Increase in Hotel Room Night Demand, 2002-2020

	Business Travel	Leisure Travel	Total
Projected Percent of New Demand	70.00%	30.00%	100.00%
Projected Percent Increase	32.50%	30.00%	31.80%
Margin of Estimate	±10%	±10%	±10%
Low Estimate, Percent Increased Demand	29.30%	27.00%	28.60%
High Estimate, Percent Increased Demand	35.80%	33.00%	35.00%

Source: Hammer, Siler, George Associates.

Table 6-44. Projected Increase in Room Night Demand, 2002-2020, Forsyth County

	Low Estimate	High Estimate
Current Annual Room Night Demand	906,024	906,024
% Increase in Demand, 2002-2020	28.60%	35.00%
Projected Annual Room Night Demand, 2020	259,123	324,357
Ideal Occupancy Rate	65.0%	65.0%
Projected New Ideal Room Night Supply, 2002-2020	398,651	499,010

Source: Hammer, Siler, George Associates.

To assess how much additional demand will exist by 2020 for hotel space within the US 52 Corridor area, one needs to look at the major factors that would effect that demand. In this instance, the major factor is the projected business growth in the area – the Corridor’s hotel market will be largely driven by demand from business travelers. To assess what that demand would be in 2020, when the US 52 Corridor project is slated for completion, the following section projects Forsyth County’s employment base for 2020, and compares it against the County’s current employment base.

To project this future employment base, short-term employment forecasts from the Employment Security Commission of North Carolina were utilized. These short-term forecasts cover a ten-year period and represent the most forward estimates of Forsyth County’s employment that are available. The annualized growth rates from these shorter-term projections were applied to the longer-term period to 2020 – the results are shown in Table 6-42, disaggregated by major industrial sector.

It is estimated that Forsyth County’s total employment will increase from slightly over 180,000 jobs in 2000 (the most recent year for which data are available) to about 240,000 jobs in 2020. This is a 1.38 percent annualized rate of growth, or approximately 32.5 percent of total job growth over the vicennial period.

For the purposes of these hotel projections, it is assumed that:

- 70 percent of the Corridor’s new hotel room demand will be generated by business travel
- 30 percent of the Corridor’s new hotel room demand will be generated by leisure travel

The following table estimates how Forsyth County’s total room night demand is projected to increase to 2020. The table estimates the growth from both the business travel and leisure travel portions of the market, and combines them to form a total estimate of percent increased demand between 2002 and 2020.

As shown, when a margin of estimate is factored into the equations, the projection of total percent increase in hotel room night demand for Forsyth

Table 6-45. Projected New Supportable Room Night Supply, 2002-2020, Forsyth County

	Low Estimate	High Estimate
Projected New Ideal Room Night Supply, 2002-2020	398,651	499,010
Current Room Night Oversupply	209,646	209,646
Total New Supportable Room Night Supply, 2002-2020	189,005	289,364

Source: Hammer, Siler, George Associates.

County to 2020 ranges from a low estimate of 28.6 percent to a high estimate of a 35.8 percent.

When applied to the current statistics (average occupancy figures for the past three years), one can estimate the new demand for annual hotel room nights in Forsyth County by 2020. This is illustrated below.

Table 6-46. New Supportable Room Night Supply, 2002-2020, US 52 Corridor

	Low Estimate	High Estimate
Total New Supportable Room Night Supply, Forsyth County	189,005	289,364
US-52 Corridor Capture Rate	25%	25%
Total New Supportable Room Night Supply, US-52 Corridor	47,300	72,300

Source: Hammer, Siler, George Associates.

Based on the range of projected increases in both business and leisure demand for room nights in Forsyth County, it is anticipated that between now and 2020, there will be a demand for an additional number of room nights from 259,000 to 324,000 per year. Based on an ideal occupancy rate of 65 percent, this translates into a demand for a total of between roughly 400,000 and 500,000 room nights per year in Forsyth County by 2020. However, the actual number of new room nights demanded must also take into account the current oversupply of room nights in the Forsyth County market, estimated above to be approximately 209,000 room nights annually.

Table 6-47. Supportable Room New Hotel Rooms, 2002-2020, US 52 Corridor

	Low Estimate	High Estimate
Total Ideal New Room Night Supply, US-52 Corridor	47,300	72,300
Nights Per Year	365	365
Supportable New Hotel Rooms	130	198

Source: Hammer, Siler, George Associates.

Using the same high and low estimates of demand, the total number of annual room nights that would satisfy the increased demand in the Forsyth County market between 2002 and 2020 is projected to be between about 189,000 and 289,000. This is, of course, a countywide total, and the US 52 Corridor would capture only a portion of this increased demand. The hotels currently located immediately proximate to US 52 constitute about 20 percent of the total room availability within Forsyth

County. Assuming a slight increase in the Corridor's hotel capture rate to 25 percent (due to the added competitiveness implicit in the Corridor project's goals), Table 6-46 shows how many of these room nights will be supportable in the Corridor area.

This shows a supportable increase in room night supply of between 47,300 and 72,300 annual room nights for the US 52 Corridor. To put this into a more comprehensible format, one can look at the number of room nights as far as how it relates to actual hotel facilities. Table 6-47 shows how many hotel rooms would be supportable within the Corridor based on the above room night projections.

This table shows that between approximately 130 and 198 hotel rooms would be supportable within the US 52 Corridor by 2020.

Recommended Hotel Development Program

With a supportable number of hotel rooms between 130 and 198 rooms, the US 52 Corridor could support one larger hotel or two smaller hotels. Given the composition of the Winston-Salem hospitality market, it is recommended that two separate hotels be a component of the Corridor development plan. These two facilities would ideally serve different markets, one more upscale than the other. A recommended development plan follows:

- Business Travel Discount Hotel. This hotel would cater to business travelers, and offer amenities such as a business center with Internet connections and fax service, exercise and swimming facilities, rooms with data ports, and other amenities favored by business travelers.
- Budget Motel. This hotel would cater to leisure travelers or other lower-end markets, and would emphasize economy and value-for-dollar.

With such a development program, the US 52 Corridor could support two hotels that would further the corridor's image as a premier business location in Winston-Salem.

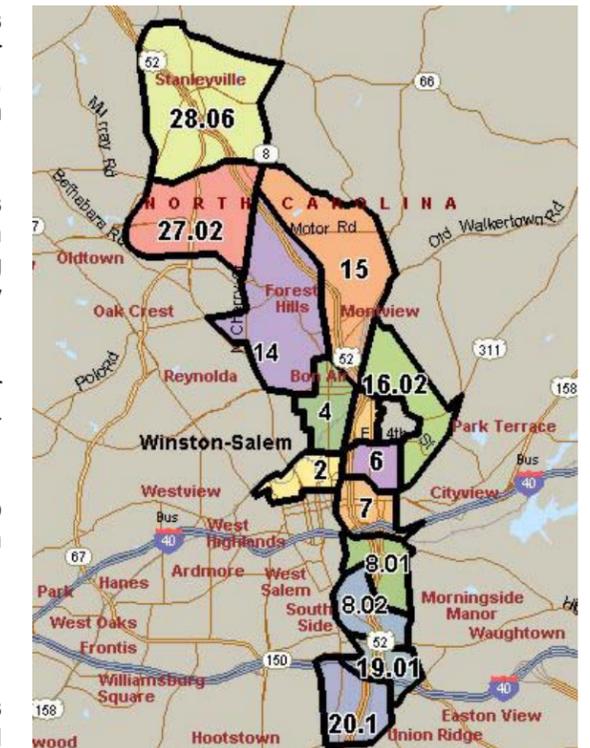
6.5.4.2 Restaurant Projections

Along with the demand for hospitality services, the demand for restaurants may experience a rise in the US 52 Corridor area due to increased population and increased business activity within the area. This section of the report analyzes the projected demand for new restaurant (eating and drinking) space within the corridor trade area, as well as land immediately proximate to US 52 itself. Demand is projected to 2020, when the US 52 Corridor project is slated for completion.

Restaurant Trade Area

Over 100 restaurants and bars are currently located within the US 52 Corridor's Restaurant Trade Area. These establishments run the spectrum of food and drink offerings, ranging from upscale sit-down restaurants to fast food franchises to drinking

Map 6-4: Restaurant Services Trade Area, by Census Tract



places. For the purposes of this analysis, the “trade area” is defined as the 14 Census Tracts that adjoin US 52 on its path through the city. This area, along with its included Census Tracts, is shown on Map 6-4.

This trade area extends along US 52 for approximately 13 miles. The width of the trade area varies with the boundaries of the component Census Tracts, from a total width of about three-fourths of a mile in the downtown areas to upwards of two miles in the northern stretches of the corridor where the population density is lower.

Table 6-48. Estimated Restaurant Sales and Resident Expenditures, Trade Area, 2001

Est. Number of Restaurants	111
Est. Total Restaurant Sales	\$76,775,037
Est. Total Resident Expenditures by Residents	\$34,945,000

Source: Claritas, Inc. and Hammer, Siler, George Associates.

The trade area as pictured extends from the Stanleyville area near Rural Hall at its northern reaches, to south of Interstate 40 (at the US 52 interchange with Clemmonsville Road). The trade area also includes adjoining neighborhoods such as Forest Hills, North Winston, East Winston, and others. In addition portions of Winston-Salem’s downtown fall within the Restaurant Trade Area.

Existing Restaurant Situation

As stated, within the Restaurant Trade Area, there are currently over 100 restaurants. The most accurate way to look at these restaurants from a retail analysis perspective is through data analysis from a service that keeps track of industry sales and consumer expenditures. For this report, information was used from Claritas, Inc., a retail and demographics research firm.

The restaurants along the US 52 Restaurant Trade Area draw the majority of their patronage from sources other than residents of the area itself. Table 6-48 shows estimates of the amount of sales from the area’s restaurants, and the amount of total restaurant expenditures attributable to the trade area’s residents.

As shown, it is estimated that the 100+ restaurants within the trade area generate slightly over \$76 million in sales per year – averaging to about \$690,000 in annual sales per establishment. Particularly revealing is that *residents* of the corridor’s trade area generate only about \$35 million per year in total restaurant purchases (measured regardless of where the actual restaurant is located). This figure is only 45 percent of what the restaurants in the same area sell.

This means that sales of the trade area restaurants consist of 45 percent of local area sales – and likely this figure is substantially less. Restaurants in the US 52 Corridor, therefore, are patronized largely by customers who live elsewhere.

Table 6-49. Projected Rates of Increase to 2020 Forsyth County Population and Employment

	Population	Employment
Estimated Growth to 2020	28.00%	32.50%
Margin of Error	±10%	±10%
Low Estimate Growth Rate	25.20%	29.30%
High Estimate Growth Rate	30.80%	35.80%

Source: Hammer, Siler, George Associates.

This is not entirely surprising, as there are several factors that would cause the area to be an importer of food customers:

- The US 52 Corridor carries a substantial amount of through-traffic, bringing non-residents into the area.
- The trade area contains portions of downtown, which has traditionally been an area of low residential population, but high commercial activity.
- The area includes major employment centers, including the downtown, which could lead to non-resident food sales.

With a consumer base that is largely non-residential, the most effective way of projecting future demand is to work from existing sales data, and to project a rate of increase that correlates with the projected rates of business growth and population growth for the area.

Forsyth County’s overall population is projected to increase by 28 percent between 2001 and 2020 – the projection range of this report. For the purposes of projecting restaurant demand, it is calculated that residential demand for restaurant services will increase at a pace correlative to the overall population. The other major component of restaurant demand is from businesses in the area, and the projected rate of employment growth also needs to be factored into restaurant demand projections. It is estimated that total employment (in all non-farm industries) within Forsyth County will increase by an estimated 32.5 percent to 2020. Due to the estimated nature of these long-range projections, it is helpful to include a margin of error in the final numbers – in this case a 10 percent variation. Table 6-49 shows this projected range of increase in both population and business growth through 2020.

Table 6-50. Restaurant Demand Range, Averaging Population and Employment Projections

	Population	Employment	Average (for Rest. Demand)
Low Estimate Growth Rate	25.20%	29.30%	27.20%
High Estimate Growth Rate	30.80%	35.80%	33.30%

Source: Hammer, Siler, George Associates.

Table 6-51. Estimated New Annual Restaurant Sales to 2020, US 52 Corridor

	Low Estimate	High Estimate
Est. 2001 Total Restaurant Sales	\$76,775,037	\$76,775,037
Growth Rate to 2020	27.2%	33.3%
Est. New Annual Sales to 2020	\$20,900,000	\$25,500,000

Source: Hammer, Siler, George Associates.

Table 6-52. New Supportable Restaurant Space to 2020, US 52 Corridor

	Low Estimate	High Estimate
Est. New Annual Sales to 2020	\$20,900,000	\$25,500,000
Est. Average Sales per Square Foot	\$325	\$325
New Supportable Restaurant Space	64,000 sq. ft.	79,000 sq. ft.

Source: Hammer, Siler, George Associates.

By 2020, there will be an additional \$20.9 million to \$25.5 million in annual demand for restaurant services within the US 52 Corridor. To put that demand figure into terms of actual restaurant space, one can use standard measures of restaurant sales per square foot of building space. For this report, it is estimated that the typical restaurant would have sales of \$325 per square foot of space. The table below translates the demand figures into square footage estimates by using this figure.

As indicated, the County’s population base is projected to grow between 25.2 percent and 30.8 percent to 2020, while the employment base is projected to grow at a similar rate of 29.3 percent to 35.8 percent. Since both projections are components of the future demand estimates for restaurant services, it is helpful to average the two ranges to arrive at an anticipated demand factor for restaurants. This is shown in Table 6-50.

The demand range percent increase to 2020 for restaurant services within Forsyth County is estimated to be between 27.2 percent and 33.3 percent. This range estimates how much additional restaurant services will be required in 2020, based upon the fact that the current supply of restaurants is supportable by existing demand. Because of the large size and geographic diversity of the US-52 Corridor, it is assumed for these calculations that the same demand range for Forsyth County would apply for the Corridor area as well.

Therefore, Table 6-51 applies the above “restaurant demand range” projections to the current estimated amount of restaurant sales within the US 52 Corridor.

Table 6-53. New Supportable Restaurant Space to 2020, US 52 Corridor, Areas Very Close to Highway

	Low Estimate	High Estimate
New Supportable Restaurant Space, Corridor	64,000 sq. ft.	79,000 sq. ft.
Capture Rate, Areas Very Close to Highway	33%	33%
New Supportable Restaurant Space, Close to Highway	21,000 sq. ft.	26,000 sq. ft.

Source: Hammer, Siler, George Associates.

Throughout the entire Corridor area (defined as a compilation of 14 Census Tracts running the length of US 52 in the City), the estimated increase in annual demand would correlate to between 64,000 and 79,000 square feet of under-roof restaurant space.

Since the Corridor itself is relatively large, only a portion of this overall supportable space will be captured on parcels immediately adjacent to US 52 – the remainder will go in neighborhoods or the downtown portion of the area that is not immediately adjacent to the highway. Table 6-53 shows the square footage of restaurant space within close proximity to US 52, figuring on a capture rate of one-third of the total Corridor’s supportable space.

This indicates that on parcels immediately adjacent to US 52, there is projected to be between 21,000 and 26,000 new supportable square feet of restaurant space by 2020.

Recommended Restaurant Development Program

With a projected amount of supportable restaurant space between 21,000 and 26,000 square feet, the area could support 4 or 5 restaurants of about 5,000 square feet each. These restaurants would be dispersed throughout the 13-mile corridor, not just in the northern portion of the corridor that is mentioned as the hotel node in the previous section.

The following development program is recommended to achieve the optimal market balance between customers seeking different levels of food service.

- **Casual Family Dining.** Development of one or two chain-style restaurants offering a casual dining atmosphere that would be suitable for residents’ needs for a family restaurant, but also appropriate for business travelers. Such restaurants would offer quality American fare with an emphasis on value; examples include Applebee’s, Ruby Tuesday, Darryl’s Restaurant, and many others.
- **Casual Specialty Dining.** Development of one restaurant that offers the same general atmosphere as the above *casual family dining* model, but with more specialized fare. Specializations would include Italian food (Olive Garden, Romano’s Macaroni Grill), gourmet pizza (Pizzeria Uno), steak/ribs (Lone Star Steakhouse, Outback Steakhouse), and others.

- **Fast Food.** Development of one or two fast food restaurants recommended, with one being a general fast food franchise (McDonald’s, Wendy’s, etc.), and the other a more specialized fast food restaurant offering possibly ethnic (Oriental, Mexican) fare or other quick-service specialized foods (fish, chicken, subs, etc.).

With this type of development program, the restaurant component of the US 52 Corridor will offer the services demanded by residential and business customers, and will complement the other development programs in the area.