

FINAL
FEASIBILITY STUDY
SURRETT DRIVE IMPROVEMENTS

Guilford and Randolph Counties
High Point, Archdale, and Trinity Cities

Prepared for:



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1.0 INTRODUCTION

The High Point Metropolitan Planning Organization (HPMPO) has prepared this feasibility study to evaluate future improvements to Surrett Drive, which is located within the cities of High Point, Archdale, and Trinity (Guilford and Randolph counties).

This feasibility study is the initial step in the planning and design process for improvements to Surrett Drive. The purpose of this study is to describe the proposed action, evaluate potential alternatives for the proposed action, and identify a preferred alternative.

The evaluation includes an estimate of costs and identification of potential issues that may require consideration in the planning and design phase of the project. As such, this study is not the product of exhaustive environmental or design investigations. Natural and human environment features within the study area are based on available data.

1.1 GENERAL DESCRIPTION

1.1.1 Project Vicinity

The project area is bordered by High Point and Greensboro to the north, Thomasville to the west, Asheboro to the south, and Archdale to the east (**Figure 1-1**).

Primary routes in the project area include Interstate 85 (I-85), Business I-85, and North Carolina Highway 62 (NC 62). I-85 is a statewide east-west facility connecting Charlotte in southern North Carolina with Chapel Hill, Durham, and the Triangle Area in central North Carolina. Business I-85 connects Greensboro to the northeast with Thomasville to the west. NC 62 is a local east-west facility connecting Thomasville to the west with Archdale to the east.

1.1.2 Surrett Drive

The subject section of Surrett Drive is approximately 4.5 miles in length. It extends from the intersection of Surrett Drive and West Market Center Drive in Guilford County southward, crossing Business 85, and continuing to the interchange of Surrett Drive with the I-85 ramps in Randolph County (**Figure 1-2**).

Surrett Drive is a two-lane radial roadway functionally classified as minor arterial. There are five signalized intersections and ten unsignalized intersections along this segment of Surrett Drive. A railroad track closely parallels the east side of the roadway from Archdale Boulevard north to Fraley Road.

Traffic generated by the commercial and industrial uses within the study area utilize Surrett Drive to connect with the Triad area, including Winston-Salem, Greensboro, and High Point, and the suburban/rural communities of Archdale, Trinity, and Randolph County. Locally, Surrett Drive connects residential areas to the south with employment centers along Surrett Drive and in High Point.

Land use within the northern end of the study area is heavily industrial, with manufacturing, warehousing, and other uses typically associated with heavy traffic and truck or freight movements. Along the southern half, Surrett Drive serves a mix of commercial uses, a high school, and low-density residential uses.

1.1.3 Project Termini

Logical termini are defined as (1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts. In order to ensure meaningful evaluation of alternatives and to avoid commitments to transportation improvements before they are fully evaluated, the action shall:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
2. Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure even if no additional transportation improvements in the area are made; and
3. Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

The proposed project is intended to improve mobility and capacity along the Surrett Drive corridor. With this in mind, potential locations for project termini were evaluated.

On the northern end, the proposed project would terminate at the intersection of West Market Center Drive. On the southern end, the project crosses I-85 Business and terminates at the intersection of Surrett Drive and the I-85 ramps. West Market Center Drive is a gateway to downtown High Point and I-85 is the highest capacity facility along Surrett Drive. These termini are logical, as improvements in this section of Surrett Drive would connect a major highway with a downtown destination and serve both local and regional travelers, which is the function of this arterial roadway. The project is approximately 4.5 miles long, a sufficient length in order to evaluate alternatives and impacts.

2 PURPOSE AND NEED

2.1 PURPOSE OF PROPOSED ACTION

The purpose of the proposed action is to improve mobility and capacity along Surrett Drive within the project study area.

2.2 NEED FOR PROPOSED ACTION

The existing two-lane radial arterial has poor vertical alignment and substandard pavement width over much of its length (11-foot travel lanes and no shoulder).

As discussed in **Section 3**, Surrett Drive is currently operating at an unacceptable level of service, with traffic volumes projected to increase in the future. Furthermore, a review of historical crash data revealed a predominance of rear-end accidents, which is indicative of a high level of congestion (**Section 3.3**).

To compound the existing congested condition of Surrett Drive, the HPMPO's member jurisdictions expect substantial growth throughout this corridor and surrounding areas, particularly in Trinity. Trinity is planning to extend public sewer lines to properties along the roadway.

According to the High Point Thoroughfare Plan Map, Surrett Drive is considered a major thoroughfare. The High Point 2030 Long Range Transportation Plan (LRTP) identifies Surrett Drive, from Market Center Drive to Business I-85, and from Fairfield Drive to Sealy Drive, as seriously congested with a Level of Service (LOS) F. According to the LRTP, these sections of Surrett Drive are recommended for improvements, including signal coordination and the addition of physical capacity. Similarly, due to capacity needs, the City of Trinity Land Development Plan (September, 2006) calls for widening Surrett Drive to a four-lane divided facility.

3 TRAFFIC OPERATIONS AND SAFETY

The discussion provided in this section is based on the *Final Surrett Drive Travel Demand Forecast Report*, dated May 29 2008 (**Appendix A**), and the *Final Surrett Drive Traffic Operations Analysis Technical Memorandum*, dated August 2008 (**Appendix B**).

3.1 TRAFFIC VOLUMES

The existing (year 2007) and no-build (year 2035) average annual daily traffic (AADT) volumes are illustrated in **Figures 4-1 through 4-4** and **Figures 5-1 through 5-4**, respectively, of the *Final Surrett Drive Traffic Operations Analysis Technical Memorandum (Appendix B)*.

As shown in **Table 3-1**, the AADT varies throughout the corridor. Currently, traffic volumes north of Sealy Drive are approximately double (50 percent higher) than volumes between Sealy Drive and I-85. In the future, traffic volumes are projected to increase throughout the corridor, with volumes in the southern half projected to approximately double. The highest traffic volumes occur between West Fairfield Road and the unsignalized intersection of Murray Circle/Archdale Boulevard intersection, both currently and in the future.

Table 3-1: Existing (Year 2007) and No-Build (Year 2035) Annual Average Daily Traffic Volumes

| Surrett Drive Segment | 2007 AADT | 2035 AADT |
|---|----------------|-----------|
| North of Market Center Drive) | 5,800 | 6,400 |
| Market Center Drive to I-85 Business | 10,200 | 12,600 |
| I-85 Business to Fraley Road / Finch Avenue | 12,400 | 17,400 |
| Fraley Road / Finch Avenue to Fairfield Road | 11,200 | 15,200 |
| Fairfield Road to Eden Terrace / Corporation Drive | 14,600 | 21,600 |
| Eden Terrace / Corporation Drive to Archdale Bl. / Murray Circle | 14,000 | 20,600 |
| Archdale Blvd. / Murray Circle to Sealy Drive / Darr Airport Road | 13,000 | 19,400 |
| Sealy Drive / Darr Airport Road to Mendenhall Road | 8,600 – 9,200* | 15,600 |
| Mendenhall Road to Mendenhall Road Extension | 10,000 | 15,600 |
| Mendenhall Road Extension to Trinity High School Drive | 8,400 | 15,400 |
| Trinity High School Drive to Uwharrie Road | 8,400 | 15,400 |
| Uwharrie Road to Turnpike Road | 8,400 | 16,800 |
| Turnpike Road to NC Highway 62 | 8,600 | 17,000 |
| NC Highway 62 to I-85 | 7,000 | 14,600 |
| South of I-85 | 4,000 | 10,200 |

Source: *Final Surrett Drive Traffic Operations Analysis Technical Memorandum*, August 2008.

* AADT varies from 9,200 vpd just south of Sealy Drive / Darr Airport Road to 8,600 vpd just north of Mendenhall Road.

3.2 TRAFFIC OPERATIONS

The level of service (LOS) is a measure of traffic congestion. The LOS is defined with letter designations from A to F that can be applied to both roadway segments and intersections. LOS A represents the best operating conditions and LOS F the worst. In urban areas, LOS D is generally considered acceptable, while in rural areas LOS C is considered acceptable.

3.2.1 Existing (Year 2007) Intersection Conditions

LOS was analyzed for fifteen intersections within the study area. **Table 3-2** summarizes the LOS and estimated intersection capacity.

Table 3-2: Existing (Year 2007) Intersection Conditions

| Surrett Drive Intersection | Signalized / Unsignalized | AM Peak Hour | | PM Peak HOUR | |
|----------------------------------|---------------------------|--------------|--------------|--------------|--------------|
| | | LOS | Capacity v/c | LOS | Capacity v/c |
| Market Center Drive (SR 1961) | Signalized | C | 0.62 | C | 0.57 |
| I-85 Business SB Ramps | Unsignalized | D | 0.66 | F | 1.07 |
| I-85 Business NB Ramps | Unsignalized | F* | 2.36 | F | 1.48 |
| Fraley Road / Finch Avenue | Signalized | C | 0.88 | C | 0.77 |
| Fairfield Road (SR 1300) | Signalized | E | 1.16 | F | 1.22 |
| Eden Terrace / Corporation Drive | Unsignalized | F | >9.99 | F | 7.04 |
| Archdale Blvd. / Murray Circle | Unsignalized | F* | 0.94 | F* | 0.98 |
| Sealy Drive / Darr Airport Road | Signalized | B | 0.79 | B | 0.53 |
| Mendhenhall Road | Unsignalized | C | 0.40 | C | 0.34 |
| Mendenhall Road Extension | Unsignalized | C | 0.26 | B | 0.16 |
| Trinity High School Drive | Unsignalized | C | 0.09 | C | 0.16 |
| Turnpike Road | Unsignalized | D | 0.49 | D | 0.40 |
| NC Highway 62 | Signalized | C | 0.76 | C | 0.74 |
| I-85 SB Ramps / Dwight Street | Unsignalized | C | 0.28 | C | 0.37 |
| I-85 NB Ramps | Unsignalized | C | 0.37 | B | 0.22 |

Source: Final Surrett Drive Traffic Operations Analysis Technical Memorandum, August 2008.

* Stop-controlled intersection with unacceptable side street LOS, but does not warrant signalization.

One of the five signalized intersections (Fairfield Road) currently operates with an unacceptable LOS. Of the ten unsignalized intersections, four currently operate with an unacceptable LOS. Three of these intersections (I-85 Business SB Ramps, I-85 Business NB Ramps, and Eden Terrace / Corporation Drive) experience side street delays and queue lengths long enough to warrant further investigation for signalization.

3.2.2 No Build (Year 2035) Intersection Conditions

A No-Build traffic analysis was performed to assess how the studied intersections would operate in the year 2035 if only currently planned improvements are made to Surrett Drive.

The No-Build (Year 2035) Conditions anticipate the improvements to Mendenhall Road. These improvements involve the realignment of Mendenhall Road across from the existing Mendenhall Road Extension to create a four-leg signalized intersection. The current three-leg intersection with Mendenhall Road would be eliminated.

The No-Build Conditions also include a new Surrett Drive intersection with Uwharrie Road / Sisters Lane Extension. This intersection is currently planned to be located between Trinity High School Drive and Turnpike Road.

The last improvement anticipated under the No-Build Conditions includes the creation of an improved west leg of the Surrett Drive / Darr Airport Road intersection.

The No-Build (Year 2035) intersection analysis indicates that four of the six signalized intersections are projected to operate with an unacceptable LOS in 2035 (Table 3-3). It should be noted that the improved Mendenhall Road Extension intersection is assumed to operate with signal control under the No-Build Conditions. All nine unsignalized intersections are projected to operate with an unacceptable LOS. Seven of these intersections experience side street delays and queue lengths long

enough to warrant further investigation for signalization. Two stop-controlled intersections operate with an unacceptable LOS, but do not warrant signalization based on analyzed queue lengths and critical movement volumes.

Table 3-3: No-Build (Year 2035) Intersection Conditions

| Surrett Drive Intersection | Signalized / Unsignalized | AM Peak Hour | | PM Peak HOUR | |
|----------------------------------|---------------------------|--------------|--------------|--------------|--------------|
| | | LOS | Capacity v/c | LOS | Capacity v/c |
| Market Center Drive (SR 1961) | Signalized | C | 0.71 | C | 0.66 |
| I-85 Business SB Ramps | Unsignalized | F | 1.59 | F | 2.60 |
| I-85 Business NB Ramps | Unsignalized | F | >9.99 | F | 8.39 |
| Fraley Road / Finch Avenue | Signalized | E | 1.32 | C | 0.92 |
| Fairfield Road (SR 1300) | Signalized | F | 1.62 | F | 1.73 |
| Eden Terrace / Corporation Drive | Unsignalized | F | >9.99 | F | >9.99 |
| Archdale Blvd. / Murray Circle | Unsignalized | F | >9.99 | F | >9.99 |
| Sealy Drive / Darr Airport Road | Signalized | E | 1.10 | D | 0.97 |
| Mendenhall Road Extension | Signalized | C | 0.92 | C | 0.91 |
| Trinity High School Drive | Unsignalized | F* | 0.56 | F* | 0.81 |
| Uwharrie Road | Unsignalized | F* | 1.48 | F* | 1.08 |
| Turnpike Road | Unsignalized | F | >9.99 | F | >9.99 |
| NC Highway 62 | Signalized | F | 1.43 | F | 1.33 |
| I-85 SB Ramps / Dwight Street | Unsignalized | F | 1.72 | F | 2.32 |
| I-85 NB Ramps | Unsignalized | F | 1.30 | F* | 0.96 |

Source: Final Surrett Drive Traffic Operations Analysis Technical Memorandum, August 2008.

* Stop-controlled intersection with unacceptable side street LOS, but does not warrant signalization.

3.3 SAFETY

Traffic crashes are often the result of deficiencies in the capacity of a transportation facility. Crash data was collected for 15 intersections along Surrett Drive for the three year period from May 1, 2004 to April 30, 2007. The NCDOT Traffic Engineering Accident Analysis System Intersection Analysis Report is included in **Appendix C**.

Crash data collected for these intersections includes the total number of crashes, types of crashes, and numbers of injury and property-only crashes (**Table 3-4** and **Table 3-5**). No fatality crashes were reported for the subject intersections.

Table 3-4: Crash Types

| Surrett Intersection | Left Turn | Right Turn | Rear End | Run off Road & Fixed Object | Angle | Side Swipe | Other |
|---|-----------|------------|----------|-----------------------------|-------|------------|-------|
| Market Center Drive (SR 1961)/College Drive (SR 1962) | 0 | 1 | 1 | 0 | 7 | 0 | 1 |
| I-85 Business/US 29/US 70 NB Ramps | 0 | 0 | 2 | 0 | 1 | 0 | 0 |
| I-85 Business/US 29/US 70 SB Ramps | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| Finch Avenue/Fraley Road | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| Fairfield Road (SR 1300) | 7 | 0 | 10 | 0 | 2 | 4 | 0 |
| Mendenhall Road (SR 1610) | 1 | 1 | 8 | 2 | 0 | 0 | 0 |

Table 3-4: Crash Types

| Surrett Intersection | Left Turn | Right Turn | Rear End | Run off Road & Fixed Object | Angle | Side Swipe | Other |
|--|-----------|------------|-----------|-----------------------------|-----------|------------|----------|
| Mendenhall Road (SR 1599) | 2 | 0 | 3 | 0 | 0 | 0 | 0 |
| Trinity High School Drive (SR 1748) | 2 | 0 | 2 | 3 | 0 | 0 | 0 |
| Turnpike Road (SR 1882) (Old Turnpike Rd) | 2 | 0 | 2 | 0 | 3 | 0 | 1 |
| Hopewell Church Road (SR 3252)/Trindale Road (NC 62) | 1 | 2 | 2 | 0 | 1 | 0 | 1 |
| TOTAL | 15 | 4 | 32 | 5 | 15 | 4 | 4 |

Source: NCDOT Traffic Engineering Accident Analysis System Intersection Analysis Report (May 1, 2004 through April 30, 2007)

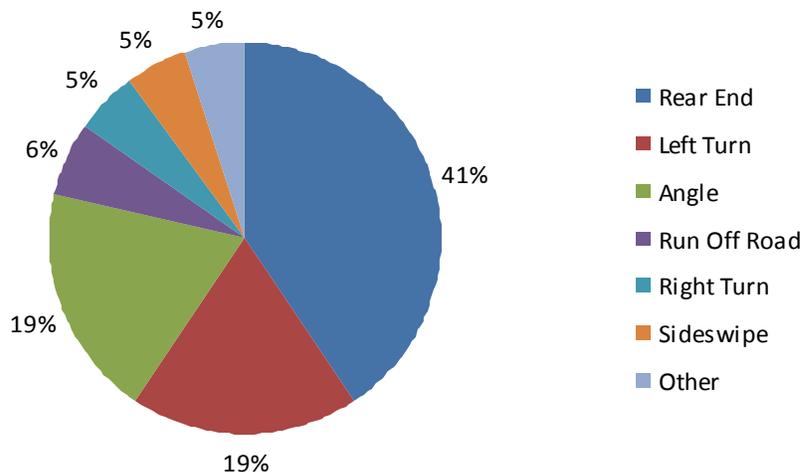
Table 3-5: Crash Severity

| Surrett Intersection | No. of Crashes | No. of Injury Crashes | No. of Property Damage Only Crashes | Crashes/100 million vehicles Entered |
|--|----------------|-----------------------|-------------------------------------|--------------------------------------|
| Market Center Dr. (SR 1961)/College Dr. (SR 1962) | 10 | 7 | 3 | 40.05 |
| I-85 Business/US 29/US 70 NB Ramps | 3 | 0 | 3 | 26.34 |
| I-85 Business/US 29/US 70 SB Ramps | 1 | 0 | 1 | 8.78 |
| Finch Avenue/Fraley Road | 3 | 1 | 2 | 20.45 |
| Fairfield Road (SR 1300) | 23 | 11 | 12 | 79.56 |
| Mendenhall Road (SR 1610) | 12 | 4 | 8 | 111.83 |
| Mendenhall Road (SR 1599) | 5 | 3 | 2 | 48.07 |
| Trinity High School Drive (SR 1748) | 7 | 5 | 2 | 65.23 |
| Turnpike Road (SR 1882) (Old Turnpike Rd) | 8 | 4 | 4 | 62.98 |
| Hopewell Church Rd. (SR 3252)/Trindale Rd. (NC 62) | 7 | 2 | 5 | 41.51 |

Source: NCDOT Traffic Engineering Accident Analysis System Intersection Analysis Report (May 1, 2004 through April 30, 2007)

A review of the crash data suggests a direct correlation between the prevalent crash types and traffic congestion along Surrett Drive. Out of the total of 79 crashes recorded, 32 (approximately 41 percent) of the crashes involved rear-end collisions. These types of crashes are expected to occur where a combination of high volumes and a large number of slowing, stopping and/or turning movements cause interruptions to the traffic flow. The highest concentrations of rear-end crashes occurred at the Surrett Drive / Fairfield Road intersection.

Crash Type Percentages



As shown in this pie chart, the second most common crash types within the study area were left turn and angle. Within the study area, 15 (19 percent) of the total crashes involved collisions while making a left turn at the Surrett Drive / Fairfield Road intersection. Fifteen (19 percent) angle crashes took place at Surrett Drive / Market Center Drive intersection.

These types of crashes typically occur when a driver fails to respond to changes in traffic signal phases (running red lights) or attempts to use insufficient gaps in the opposing traffic stream. An angle type crash is an indicator of congested conditions and represents the effect such conditions can have on driver behavior.

4 ALTERNATIVES

The purpose of the feasibility study is to provide an initial screening of the Surrett Drive improvement options so that the High Point Department of Transportation can better plan for future right of way needs. Four project alternatives are considered; Minor Widening, Traffic Operations, Major Widening, and Ultimate Section. The Preliminary Plans for these alternatives can be found in **Appendix D**. In addition, the viability of a new location alternative is considered.

4.1 MINOR WIDENING ALTERNATIVE

The Minor Widening Alternative would widen the existing two lanes on Surrett Drive from a variable existing width to 12-foot lanes with a four-foot paved shoulder entirely within the existing right of way. Typical cross sections for the Minor Widening Alternative are illustrated in **Figure 4-1**.

Additional lanes are not proposed under this alternative. Intersection improvements consist of signal phase modifications that would require additional signal equipment, and the conversion of stop-controlled intersections to signalized intersections when warranted. Improvements to existing intersection geometry or turn lanes are not proposed.

4.2 TRAFFIC OPERATIONS ALTERNATIVE

The goal of the Traffic Operations Alternative is to improve the LOS at intersections along Surrett Drive without overall facility improvements. Some additional right of way would be needed for this alternative.

The Traffic Operations Alternative for the project has been developed based on the results of the traffic operations analysis and queuing analysis. The Traffic Operations Alternative is divided into two sections (A (south) & B (north)). Section A is south of Archdale Boulevard (approximately the center of the corridor) and is defined as rural with a 50 mph design speed. Section B is north of Archdale Boulevard and is defined as urban with a 40 mph design speed.

The Traffic Operations Alternative includes intersection improvements such as minor widening in intersection areas, the addition of turn lanes, signal phase modifications that would require additional signal equipment, and the conversion of stop-controlled intersections to signalized intersections when warranted. In addition, this alternative includes the realignment of Mendenhall Road to tie into the Mendenhall Road extension. The following nine intersections, from south to north, would be improved under this alternative:

- I-85 southbound off ramp/loop
- NC 62
- Mendenhall Road and Extension
- Sealy Drive
- Archdale Boulevard
- Corporation Drive/Eden Terrace
- Fairfield Road
- Fraley Road
- Business 85 Ramps

4.3 MAJOR WIDENING ALTERNATIVE

As with the Traffic Operations Alternative, the Major Widening Alternative is divided into the same two sections (A & B) (Section A (south) at 50 mph design speed and Section B (north) at 40 mph speed).

Typical cross sections for the Major Widening Alternative are illustrated in **Figure 4-2**. This alternative includes widening Surrett Drive from two lanes to four lanes. The proposed typical sections for Section A include a four-lane facility with a 17.5-foot raised median. Outside paved

shoulders would be located from the I-85 interchange to 800 feet north of Mendenhall Road. Outside curb and gutter would be utilized from 800 feet north of Mendenhall Road to Archdale Drive. In addition, this alternative includes the realignment of Mendenhall Road to tie into the Mendenhall Road extension.

The proposed typical section for Section B (north) is a five-lane curb and gutter facility from Archdale Drive to North Market Drive. A four-foot berm would be constructed along the right side of the typical section, closely paralleling the existing railroad right of way.

The Major Widening Alternative also includes the upgrade of the existing I-85 Business interchange consisting of a new bridge and ramp and loop realignments.

4.4 ULTIMATE SECTION ALTERNATIVE

The Ultimate Section Alternative also is divided in Section A (south) and Section B (north), with the same design speeds as the Traffic Operations and Major Widening Alternatives. This alternative reflects the desirable maximum cross-section width, without consideration of existing constraints.

Typical cross sections for the Ultimate Section Alternative are included in **Figure 4-3**. The proposed typical sections for Section A (south) include a four-lane divided facility with a 23-foot raised median. Outside paved shoulders would be utilized from the I-85 interchange to 800 feet north of Mendenhall Road. Outside curb and gutter would be utilized from 800 feet north of Mendenhall Road to Archdale Drive. In addition, this alternative includes the realignment of Mendenhall Road to tie into the Mendenhall Road extension.

The proposed typical sections for Section B (north) include a four-lane divided facility with a 23-foot raised median. Outside curb and gutter would be included from Archdale Drive to North Market Drive.

Under the Ultimate Section Alternative, a 45-foot offset is proposed from the centerline of the existing railroad tracks to the back of the two-foot, six-inch curb and gutter located on the east side of the typical section. This offset would provide adequate distance to construct a full berm width plus an assumed railroad ditch while accommodating the potential for future utility relocation.

This option also calls for the redesign of the existing I-85 Business interchange. The existing half-clover interchange would be removed and replaced with a new compressed diamond interchange utilizing ramps in each quadrant.

4.5 OTHER ALTERNATIVES CONSIDERED

A cursory evaluation of the existing natural and human environment features and an engineering judgment of the alternatives considered were conducted to determine if analysis of a new location alternative would be warranted to avoid excessive environmental or cost impacts that may be associated with the widening or traffic operations alternatives.

A new location alternative would involve the construction of a four-lane median divided facility similar to the Major Widening Alternative. In order to alleviate congestion throughout the project corridor, the new location facility would have to be located within the general vicinity of the Surrett Drive corridor. A new facility constructed between Business 85 and I-85 would be substantially more expensive and create more impacts than the Major Widening Alternative, Minor Widening Alternative, and Traffic Operations Alternative.

A more common-sense approach to potential road network improvements is shown in the Thoroughfare Plan. As shown in **Figure 1-2**, the Thoroughfare Plan proposes improvements to

Surrett Drive as well as several shorter new location roadway connections. These include extension of Sealy Road west to Mendenhall Road, and extension of Shore Road south to connect to the Sealy Road Extension, and the extension of Uwharrie/Sisters Lane from Mendenhall Road south to Surrett Drive. Extending Uwharrie/Sisters Lane to Surrett Drive would create a parallel corridor to Surrett Drive from just south of Trinity High School to Fairfield Road.

5 ENVIRONMENTAL IMPACTS

This feasibility study includes a preliminary screening of the existing natural and human environment features within the study area. The intent of this review is to identify the nature and approximate magnitude of potential environmental impacts early in the process. The information obtained for the environmental screening is from readily available State and county databases and a windshield survey. No detailed survey work was conducted for this study. As such, this screening is not a substitute for the Federal environmental documentation process.

For comparative purposes, **Table 5-1** includes the length in miles and the existing and total right of way acreages for each alternative. As shown in **Table 5-1**, the Minor Widening Alternative would not require additional right of way acreage. However, the Ultimate Section Alternative would require the highest increase in right of way acreage.

Table 5-1: Right of Way Acreage per Alternative

| Alternative | Length (miles) | Existing ROW (acres) | Additional ROW (acres) | Total ROW (acres) |
|--------------------|----------------|----------------------|------------------------|-------------------|
| Minor Widening | 4.0 | 36.6 | 0.0 | 36.6 |
| Traffic Operations | 3.3 | 38.3 | 5.0 | 43.3 |
| Major Widening | 4.5 | 59.5 | 16.8 | 76.3 |
| Ultimate Section | 4.5 | 71.7 | 24.6 | 96.3 |

Source: Project Designs, PBS&J, 2008

Known natural and human environment features along Surrett Drive are shown in **Figure 5-1** (southern section) and **Figure 5-2** (northern section) and discussed below.

5.1 NATURAL ENVIRONMENT

5.1.1 Water Resources

As shown in **Figures 5-1** and **5-2**, the project study area contains several floodways, including a 100-year and 500-year floodplain.

Portions of the project study area are located within the Cape Fear and Yadkin watersheds (Letter from NC Division of Water Quality dated November 21, 2007 included in **Appendix E**). The Cape Fear watershed is a Class III protected watershed. Water Supply III (WS-III) waters are not used as sources of potable water. The Yadkin watershed is a Class IV protected watershed. Water Supply IV (WS-IV) waters are used as sources of potable water. WS-IV waters are generally in *moderately to highly developed* watersheds, and involve some categorical restrictions on discharges.

Based on a screening of GIS data for each alternative, potential impacts to watersheds within the project study area were calculated. As shown in **Table 5-2**, implementation of the Ultimate Section Alternative would result in the most impacts to local watersheds.

The southern project area crosses the upper reaches of the Uwharrie River just north of the intersection of Surrett Drive and Turnpike Road. Richland Creek, which is a 303(d) listed stream, traverses the northern portion of the study area just north of Elm Street. Muddy Creek, which is a North Carolina impaired stream, parallels Sealy Drive, and is located east of Surrett Drive from Murray Circle to just north of Eden Terrace / Corporation Drive. As shown in **Table 5-2**, implementation of the Ultimate Section Alternative would result in the most stream crossings. A review of the National Wetland Inventory (NWI) reveals several wetlands throughout the study area (**Figure 5-1** and **Figure 5-2**). In addition, implementation of the Ultimate Section Alternative would result in the most impacts to NWI wetlands.

Table 5-2: Water Resource Impacts

| Resource | | Minor Widening Alternative | Traffic Operations Alternative | Major Widening Alternative | Ultimate Section Alternative |
|--|-----------------------------|--|--|---|---|
| Floodplains (acres) | Total | 2.5 | 3.5 | 4.5 | 6.0 |
| | Impacts by Stream | A Zone - (0.89) (Uwharrie River) A Zone - (1.45) (Little Uwharrie Creek) AE Zone - (0.3) (Richland Creek) 500-Yr Zone - (0.15) (Richland Creek) | A Zone - (3.5) (Little Uwharrie River) | A Zone - (1.13) (Uwharrie River) A Zone - (1.67) (Little Uwharrie River) AE Zone - (1.6) (Richland Creek) 500-Yr Zone - (0.8) (Richland Creek) | A Zone - (1.18) (Uwharrie River) A Zone - (4.61) (Little Uwharrie Creek) AE Zone - (0.9) (Richland Creek) 500-Yr Zone (0.8) (Richland Creek) |
| Watersheds (acres) | Total | 36.6 | 43.3 | 76.3 | 96.3 |
| | Impacts by Watershed | Cape Fear - (11.21) Yadkin - (25.45) | Cape Fear - (18.45) Yadkin - (24.85) | Cape Fear - (31.36) Yadkin - (44.95) | Cape Fear - (42.48) Yadkin - (53.81) |
| Streams (# of crossings) | Total | 3 | 4 | 5 | 6 |
| | Impacts by Stream | Little Uwharrie River (1) Uwharrie River (1) Tributary to Richland Creek (1) | Little Uwharrie River (3) Muddy Creek (1) | Little Uwharrie River (2) Uwharrie River (1) Tributaries to Richland Creek (2) | Little Uwharrie River (3) Uwharrie River (1) Tributaries to Richland Creek (2) |
| Total Streams (linear feet within ROW) | Total | 443.6 | 721.5 | 785.8 | 1,185.3 |
| | Impacts by Stream | Little Uwharrie River (224.9) Uwharrie River (129.8) Tributary to Richland Creek (88.8) | Little Uwharrie River (571.7) Muddy Creek (149.7) | Little Uwharrie River (312.3) Uwharrie River (163.7) Tributaries to Richland Creek (309.7) | Little Uwharrie River (864) Uwharrie River (170.9) Tributaries to Richland Creek (150.3) |
| NWI Wetlands (acres) | Total | 0.5 | 0.0 | 0.6 | 0.7 |
| | Wetland | Uwharrie River | | Uwharrie River | Uwharrie River |

Source: Available GIS Data

5.1.2 Protected Species

The NC Department of Environment and Natural Resources - Natural Heritage Program provided information regarding resources in the project area in a letter dated November 26, 2007. This letter is included in **Appendix E**. There are no records of rare species, significant natural communities, significant natural heritage areas, or conservation/managed areas along the project or within one mile of the project.

Although there are no recorded occurrences of Natural Heritage Program elements, there may be protected species or significant natural communities in the undeveloped areas along the project that have simply not been surveyed.

5.2 HUMAN ENVIRONMENT

5.2.1 Land Use

Land use within the northern end of the study area is heavily industrial, with manufacturing, warehousing, and other uses typically associated with heavy traffic and trucking movements. Along the southern portion of the corridor, Surrett Drive serves a mix of commercial uses, the Guilrand Fire Department, Trinity High School, and low-density residential uses.

5.2.2 Hazardous Materials

As shown on **Figure 5-1** and **Figure 5-2**), there are several hazardous substance disposal sites within the project study area. The hazardous materials site owned by Duke Refining Corporation located on Jarrell Street, just north of US-85 Business, would impact implementation of the Major Widening Alternative and Ultimate Section Alternative. Hazardous materials sites likely would not impact either of the two other project alternatives. Additional studies would be needed to determine the conditions on the site and severity of impact.

5.2.3 Farmland

There are no active farming operations within the Surrett Drive corridor and much of the study area is developed. However, some vacant areas within Randolph County may be viable farmland. As such, soil data and USGS maps for the Randolph County portion of the study area were analyzed. As shown in **Table 5-3**, the Ultimate Section Alternative, which would require the most right of way, also would impact the most farmland soils.

Table 5-3: Farmland Soils Impacts

| Alternative | Prime Farmland Soils (acres) | Farmland Soils of Statewide Importance (acres) |
|--------------------|------------------------------|--|
| Minor Widening | 7.8 | 2.0 |
| Traffic Operations | 9.4 | 3.2 |
| Major Widening | 10.9 | 2.8 |
| Ultimate Section | 13.4 | 2.9 |

Source: Natural Resource Conservation Service, 2008

5.2.4 Archaeological and Historic Resources

The State Historic Preservation Office (HPO) provided information regarding known archaeological and historic resources in the project area in a letter dated January 15, 2008. This letter is included in **Appendix E**.

Archaeological Resources. In their letter dated January 15, 2008 (**Appendix E**), the State Historic Preservation Office states that “there are no recorded archaeological sites in the immediate vicinity of Surrett Drive”. They also state that “If the proposed improvements are not extensive, the majority of the project should have no effect on archaeological resources. The area of the crossing of the Uhwarrie River may have the potential to affect as yet unrecorded archaeological sites. We recommend that you forward plans of this area as they develop, so we may advise you as to any needed archaeological investigations in that area.”

Historic Resources. There is one known historic resource in the area of potential effect, the Highland Cotton Mill and Village (Site GF 636). This historic district is located one block to the northwest of the project terminus at West Market Street. Impacts to this historic district are not anticipated under any of the project alternatives.

5.2.5 Economics

According to the Employment Security Commission of North Carolina (<http://www.ncesc.com/>), in 2006 Manufacturing was the largest employment sector, accounting for approximately 42 percent of the private sector employment base of Randolph County. Trade, Transportation and Utilities ranked as the largest employment sector for Guilford County.

The NC Department of Commerce annually ranks the State's 100 counties based on economic well-being and assigns each a Tier designation. The 41 most distressed counties are designated as Tier 1, the next 39 as Tier 2 and the 20 least distressed as Tier 3. Randolph County has a Tier 2 ranking and Guilford County has a Tier 3 ranking (<http://www.nccommerce.com>).

If most of the businesses along the route remain after construction, improvements to Surratt Drive likely would benefit the economy of the High Point area by providing better access to I-85 from downtown High Point and the commercial/industrial area of the northern half of Surratt Drive.

5.2.6 Environmental Justice

Federal laws and regulations require the evaluation of effects of transportation actions on minority and low-income populations, which in the past have been underserved in the decision-making process.

The need to identify low-income and minority populations and incorporate their input in the project's decision-making process gained greater emphasis as a result of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-income Populations* (February 11, 1994). This Order directs all Federal agencies to determine whether a proposed action would have a disproportionately high and adverse impact on minority and/or low-income populations.

In April 1997, the US Department of Transportation (USDOT) issued the *USDOT Order on Environmental Justice to Address Environmental Justice in Minority Populations and Low-Income Populations (DOT Order 5610.2)* to summarize and expand upon the requirements of Executive Order 12898 on environmental justice. The Order generally describes the process for incorporating environmental justice principles into all USDOT existing programs, policies, and activities that are undertaken, funded, or approved by the FHWA, the FTA, or other USDOT entities.

The three fundamental environmental justice principles are:

- 1) To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority and low-income populations.
- 2) To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- 3) To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

The USDOT Order 5610.2 defines "minority" in the definition section of its appendix and provides definitions of four minority groups addressed by Executive Order 12898. These groups are:

- 1) Black – a person having origins in any of the black racial groups of Africa.
- 2) Hispanic – a person of Mexican, Puerto Rican, Cuban, Central or South America, or other Spanish culture or origin regardless of race.
- 3) Asian – a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.

4) American Indian and Alaskan Native – a person having origins in any of the original people of North America and who maintains tribal affiliation or community attachment.

It also defines ‘low-income’ as a person (of any race) whose household income (or in the case of a community or group, whose median household income) is at or below the U.S. Department of Health and Human Services poverty guidelines.

As shown in **Table 5-4**, the project study area is included in six Census Tract Block Groups. The median household income and total population within these block groups were studied.

Table 5-4: Census Block Groups in Study Area

| Randolph County | Guilford County |
|---------------------|-----------------|
| CT 315.01, BG 1 | CT 143, BG 2 |
| CT 316.01, BG 1 & 3 | CT 145.01, BG 1 |
| CT 316.02, BG 1 | |

Source: Census 2000

Household Income. Data on median household income within the corridor were compared to Randolph (\$38,348) and Guilford (\$42,618) counties and the State (\$39,184). The median household income for the four Census Tract Block Groups in Randolph County ranged between \$34,375 (CT 316.02, BG 1) and \$48,438 (CT 316.01, BG 3). Of the four Census Tract Block Groups, only CT 316.02, BG 1 was lower than Randolph County and the State. In contrast, the median household incomes for both of the Census Tract Block Groups within Guilford County were lower than Guilford County and the State (CT 143, BG 2 with \$28,626 and CT 145.01, BG 1 with \$31,625).

Race/Ethnicity. Whites are the predominant racial group in the project area, consisting of comprising approximately 91 percent of the population in the study area block groups. Census Tract 143 Block Group 2, located in Guilford County, is the most diverse, with approximately 54 percent white, 18 percent Black or African American, 16 percent Asian, and 9.2 percent Hispanic or Latino. Census Tract 145.01 Block Group 1, also located in Guilford County, is approximately 74 percent white, 13 percent Black or African American, 4.2 percent Asian, and 9.9 percent Hispanic or Latino. In contrast, the Census Tract Block Groups located in Randolph County are less diverse with the white population ranging between 89 and 98 percent.

Table 5-5: 2008 Poverty Guidelines

| Persons in Family/Household | 48 Contiguous States and DC |
|-----------------------------|-----------------------------|
| 1 | \$10,400 |
| 2 | \$14,000 |
| 3 | \$17,600 |
| 4 | \$21,200 |
| 5 | \$24,800 |
| 6 | \$28,400 |
| 7 | \$32,000 |
| 8* | \$35,600 |

Source: Federal Register, Vol. 73, No. 15, January 23, 2008. *Each additional person, add \$3,600.

Based upon the above review of the Census data and a project site visits there does not appear to be relatively high percentages of minority populations in the area. Although the economic make-up of the corridor includes lower household income levels, the income levels are not below that identified by the US Department of Health and Human Services poverty guidelines (**Table 5-5**). As such, implementation of either of the project alternatives would not disproportionately impact any special populations identified in the environmental justice requirements.

5.2.7 Property Acquisition and Relocation

All of the alternatives were reviewed to determine the number of parcels to be acquired and the approximate number of relocations, with the exception of the Minor Widening Alternative. Since this alternative would not include improvements outside the existing right of way, property acquisition would not be required and there would be no associated right of way costs. Identification of impacted parcels per alternative and right of way cost estimates are included in **Appendix F**.

In order to determine the approximate number of acquisitions and relocations, aerial preliminary plan sheets, county GIS property data systems, and other real estate data base websites were reviewed. A field review was not conducted. Potentially impacted parcels were identified and the property tax

records obtained for base information for each alternative. **Table 5-6** includes the number of impacted parcels that are located within the right of way for each alternative based on current land use, as well as the number of potential relocation parcels per alternative.

Table 5-6: Land Uses Within Right of Way

| Alternative | Potential Relocations | Number of Parcels in Right of Way | | | | | | |
|--------------------|-----------------------|-----------------------------------|----------------------|------------|---------------------|--------|-------------|-------------|
| | | Total Parcels | General Comm/ Retail | Industrial | Light Manufacturing | Church | Residential | Vacant Land |
| Traffic Operations | 2 | 69 | 9 | 8 | 6 | 2 | 16 | 28 |
| Major Widening | 11 | 107 | 12 | 15 | 7 | 3 | 24 | 46 |
| Ultimate Section | 22 | 119 | 12 | 17 | 9 | 3 | 28 | 50 |

Source: Right of Way Estimate, PBS&J, 2008

5.2.8 Right of Way and Construction Costs

Right-of-way costs were estimated using tax values available on-line at the Guilford County and Randolph County websites. **Appendix F** contains the estimate spreadsheets. If the proposed right of way passed through a structure, the parcel was assumed to be a relocation, and the entire tax value was assumed for the right-of-way cost estimate. For partial takes of parcels, the cost was estimated by multiplying the tax-assessed land value by the percent of the parcel required for right of way. These values were multiplied by a factor of three to account for market conditions, relocation costs, and other contingencies.

Preliminary construction costs for each alternative also were developed. The breakdown of the costs associated with the construction of each alternative can be found in **Appendix F**.

The total estimated costs (construction and right of way) in 2008 dollars are listed in **Table 5-7**. As expected, the Ultimate Section Alternative would cost the most to implement and the Minor Widening Alternative the least.

Table 5-7: Estimated Right of Way and Construction Costs by Alternative

| Alternative | Construction Cost (\$millions) | | | Right of Way Cost (\$millions) | | | Total Cost |
|--|--------------------------------|-------------------|-----------|--------------------------------|-------------------|-----------|------------|
| | Section A (south) | Section B (north) | Total A+B | Section A (south) | Section B (north) | Total A+B | |
| Minor Widening (not divided into sections) | \$7.10 | -- | \$7.10 | -- | -- | -- | \$7.10 |
| Traffic Operations | \$4.45 | \$9.00 | \$13.45 | \$2.61 | \$0.17 | \$2.77 | \$16.22 |
| Major Widening | \$14.20 | \$14.20 | \$28.40 | \$3.54 | \$6.38 | \$9.92 | \$38.32 |
| Ultimate Section | \$14.40 | \$21.00 | \$35.40 | \$4.33 | \$32.81 | \$37.14 | \$72.54 |

Source: Right of Way Estimate, PBS&J, 2008

6 RECOMMENDATIONS

As described in **Section 4**, there are four alternatives considered for increasing capacity and improving congestion along the Surrett Drive corridor. When comparing the potential impacts associated with implementation of the four project alternatives, implementation of the Ultimate Section Alternative would result in the most impacts to the natural and human environment. However, this alternative would result in the most improvements to capacity. Conversely, the Minor Widening Alternative would cost the least, but also result in the least benefit.

This feasibility study recommends implementing a combination of the Ultimate Section Alternative south of Archdale Boulevard (Section A) and the Traffic Operations Alternative north of Archdale (Section B) Boulevard. South of Archdale Boulevard, land uses are more suburban and there is more room to increase right of way without causing a substantial number of relocations.

Room for improvements north of Archdale Boulevard is constrained by dense industrial/commercial development and the proximity of the rail line directly along the east side of existing Surrett Drive. The Traffic Operations Alternative would provide the best balance between cost and impacts north of Archdale Boulevard.

Total estimated costs for a combined Ultimate Section (Section A)/Traffic Operations (Section B) Alternative would be \$27.9 million, including \$23.4 million for construction and \$4.5 million for right of way.