

FEASIBILITY STUDY

Town of Waynesville

US 23 Business from SR 1164 (Hyatt Creek Road)
to Ninevah Road in Waynesville

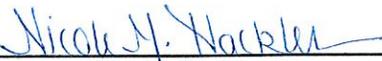
Haywood County

Division 14

FS-0114 B



Prepared by the
Program Development Branch
Division of Highways
N. C. Department of Transportation



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**US 23 Business from SR 1164 (Hyatt Creek Road)
to Ninevah Road in Waynesville
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FS-0114 B**

I. General Description

This feasibility study describes upgrading US 23 Business from SR 1164 (Hyatt Creek Road) to Ninevah Road in Waynesville, a distance of approximately 0.9 miles. The project location is shown on Figure 1. As part of this study three different cross-sections were investigated. The details of each are as follows:

- ◆ **ALTERNATIVE #1:** Three-lane curb and gutter section on 80 feet of right-of-way.
- ◆ **ALTERNATIVE #2:** Five-lane curb and gutter section on 100 feet of right-of-way.
- ◆ **ALTERNATIVE #3:** Four-lane divided curb and gutter section on 100 feet of right-of-way.

This study is the initial step in the planning and design process for this project and is not the product of exhaustive environmental or design investigations. The purpose of this study is to describe the proposed project including costs, and to identify potential problems that may require consideration in the planning and design phases.

II. Background

The purpose of this project is to increase the traffic carrying capacity and safety of US 23 Business, as well as provide improved multilane access to Waynesville. This project was requested by the Town of Waynesville.

US 23 Business is designated as principal arterial in the North Carolina Statewide Functional Classification System and as a major thoroughfare on the Waynesville Area Thoroughfare Plan. US 23 Business is currently a two-lane facility, 22 feet wide from edge of pavement to edge of pavement, with intermittent areas of curb and gutter. The development along this road is a combination of residential and commercial.

There are three existing traffic signals on US 23 Business, one at the intersection of SR 1164 (Hyatt Creek Road), one at SR 1147 (Allen's Creek Road)/Brown Avenue and a third at Ninevah Road/Riverbend Street.

Norfolk Southern Railroad (NS) currently operates a railway which crosses US 23 Business just north of Hendrix Street. The crossing is at-grade with railroad flashers, and carries four trains per day at a maximum speed of 25 miles per hour. Based on the Policy and Procedures Manual the exposure index for the design year at this location would be 78,400, which would meet minimum urban warrants of 30,000 for a grade separation at this location. However, access to surrounding businesses could not be maintained if a grade separation were to be constructed, and given the severity of these impacts this option was not considered a viable alternative within the scope of this study. The cost of upgraded signals and gates were factored in to all alternatives instead.

In order to further minimize the railroad conflicts within the limits of this project, it was also determined Hendrix Street, just east of the project limits, would need to be reworked to a right-in right-out configuration at the intersection with US 23 Business. An existing railroad crossing on Hendrix Street would also be upgraded to include signals and gates to further improve safety and reduce vehicle/train conflicts.

The current year Average Daily Traffic (ADT) along US 23 Business within the project limits ranges from 7,800 vehicles per day (vpd) to 11,400 vpd. For the design year 2025, the estimated traffic volumes on US 23 Business will range from 13,400 vehicles per day (vpd) to 19,600 vpd. Truck traffic is estimated to make up approximately five percent of the daily traffic.

Currently the intersections along US 23 Business operate at Level of Service (LOS) "B" or better, with the exception of the intersection at Allen's Creek Road/Brown Avenue which is now operating at a LOS "F". If no improvements are made, all intersections along US 23 Business will be operating an a LOS "F" in the design year 2025, with the exception of Ninevah Road/Riverbend Street which will be operating at a LOS "E". In order to further improve traffic operations, additional intersection improvements have been included in this project.

During the three-year period from January 1998 to December of 2000, there were 9 accidents reported within the project limits. There were 3 injuries reported as a result of these incidents with no fatalities. The accident rate for this roadway is 8.96 accidents per 100 million vehicle miles of travel (acc/100mvm), which is considerably lower than the 1996 to 1998 statewide rate of 290.84 accidents/100mvm for undivided two-lane urban US routes.

III. Description of Project

It is proposed to widen US 23 Business from SR 1164 (Hyatt Creek Road) to Ninevah Road, a distance of 0.9 miles. The project location is shown on Figure 1. Three cross-sections were initially proposed for this project and are as follows:

ALTERNATIVE #1: Three-lane curb and gutter section, 40' wide face to face of curbs, with 10-foot berms. The proposed right of way width for this section is 80-feet in order to minimize the right of way impacts. However, it was discovered there was very little difference in right of way impacts between all alternatives shown below.

With this proposed cross-section, it is anticipated there will be 9 (nine) residences and 30 (thirty) businesses relocated due to this project. The total cost of this alternative, including construction and right-of-way, is estimated to be \$ 11,000,000.

| | |
|-------------------|--------------|
| Construction..... | \$ 3,300,000 |
| Right-of-Way..... | \$ 7,700,000 |

Total Project Cost (Alternative 1).....\$ 11,000,000

ALTERNATIVE #2: Five-lane curb and gutter section, 64' wide face to face of curbs, with 10-foot berms. The proposed right of way width for this section is 100 feet.

With this proposed cross-section, it is anticipated there will be 11 (eleven) residences and 30 (thirty) businesses relocated due to this project. The total cost of this alternative, including construction and right-of way, is estimated to be \$ 14,400,000.

| | |
|-------------------|--------------|
| Construction..... | \$ 5,300,000 |
| Right-of-Way..... | \$ 9,100,000 |

Total Project Cost (Alternative 2).....\$14,400,000

ALTERNATIVE #3: Four-lane divided curb and gutter section, 70-foot wide face to face of curbs, with an 18-foot raised grassed median and 10-foot berms. The proposed right of way width for this section is 100-feet.

With this proposed cross-section, it is anticipated there will be 11 (eleven) residences and 30 (thirty) businesses relocated due to this project. The total cost of this alternative, including construction and right-of way, is estimated to be \$ 15,000,000.

| | |
|---|--------------|
| Construction..... | \$ 5,900,000 |
| Right-of-Way..... | \$ 9,100,000 |
| <hr/> | |
| Total Project Cost (Alternative 3)..... | \$15,000,000 |

During the investigation of the above alternatives it was discovered that the existing US 23 Bypass interchange, just outside the project limits, failed to function during the 2025 design year. In order to effectively utilize the new modifications proposed on US 23 Business, it was deemed necessary to explore interchange modifications at US 23 Bypass. These modifications included roadway widening an additional 0.3 miles west of the original limits of the project, new ramp alignment from south to north and new ramp construction in the southwest quadrant of the interchange at SR 1164/Hyatt Creek Road and US 23 Bypass (in order to avoid affecting two new businesses in the northwest quadrant). These proposed modifications improved conditions in the corridor to a level of service (LOS) "D" or better throughout the length of the project.

Two interchange modification options were investigated, and are discussed below:

ALTERNATIVE #4 - FIVE-LANE ROADWAY MODIFICATIONS WITH INTERCHANGE ALTERNATIVE: Five-lane curb and gutter section, 64' wide face to face of curbs, with 10-foot berms. The proposed right of way width for this section is 100 feet, with the extended project length being approximately 1.2 miles long. This is the same proposed cross section as Alternative #2, with the exception of additional road widening at the west end of the project and the US 23 Business interchange modifications.

With this proposed cross-section, it is anticipated there will be 11 (eleven) residences and 30 (thirty) businesses relocated due to this project. The total cost of this alternative, including construction and right-of way, is estimated to be \$ 24,400,000.

| | |
|---|--------------|
| Construction..... | \$13,200,000 |
| Right-of-Way..... | \$11,200,000 |
| <hr/> | |
| Total Project Cost (Alternative 4)..... | \$24,400,000 |

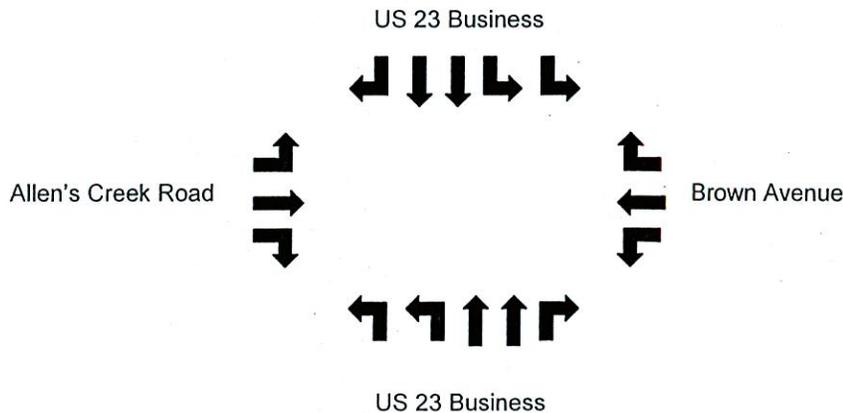
ALTERNATIVE #5 - FOUR-LANE ROADWAY MODIFICATIONS WITH INTERCHANGE ALTERNATIVE:

Four-lane divided curb and gutter section, 70-foot wide face to face of curbs, with an 18-foot raised grassed median and 10-foot berms. The proposed right of way width for this section is 100-feet, with the extended project length being approximately 1.2 miles long. This is the same proposed cross section as Alternative #3, with the exception of additional road widening at the west end of the project and the US 23 Business interchange modifications.

With this proposed cross-section, it is anticipated there will be 11 (eleven) residences and 30 (thirty) businesses relocated due to this project. The total cost of this alternative, including construction and right-of way, is estimated to be \$ 25,200,000.

| | |
|---|--------------|
| Construction..... | \$14,000,000 |
| Right-of-Way..... | \$11,200,000 |
| <hr/> | |
| Total Project Cost (Alternative 5)..... | \$25,200,000 |

In addition to the above interchange modifications, roadway improvements will be needed on the Allen's Creek Road approach to the US 23 Business intersection in order to ensure continual traffic movement and minimum levels of service in design year 2025. The proposed configuration and associated costs are shown below:



With the proposed intersection modifications, it is anticipated there will be 12 (twelve) residences and 2 (two) businesses relocated due to this project. The total cost of this alternative, including construction and right-of way, is estimated to be \$ 2,000,000.

| | |
|--------------------------------------|--------------|
| Construction..... | \$ 200,000 |
| Right-of-Way..... | \$ 1,800,000 |
| <hr/> | |
| Allen's Creek Intersection Cost..... | \$ 2,000,000 |

IV. Recommendations

ALTERNATIVE #1: The analysis for the three-lane curb and gutter section showed it would not be able to accommodate the projected 2025 design year volumes with an acceptable level of service. For this reason, Alternative #1 was not selected as the recommended option.

ALTERNATIVE #2 & ALTERNATIVE #3: It was found that both the five-lane curb and gutter section (Alternative #2) and the four-lane divided curb and gutter section (Alternative #3) would be able to accommodate design year 2025 volumes within the given project limits, however the anticipated traffic volumes were causing failure at the existing US 23 Bypass interchange. Since the new construction would not be effectively utilized if there were operational problems occurring at the beginning of the project, neither of these alternatives were selected as the recommended option.

ALTERNATIVE #4 AND ALTERNATIVE #5: It was found that with the proposed interchange modifications to US 23 Bypass that both the five-lane curb and gutter section (Alternative #4) and the four-lane divided curb and gutter section (Alternative #5) would be able to accommodate design year 2025 volumes within the given project limits as well as at the US 23 Bypass interchange. However, five-lane sections tend to promote strip development and indiscriminate left turn movements, while four-lane divided sections minimize strip development, prevent indiscriminate left turn movements and allow pedestrian refuge if needed. ***Because of these factors, Alternative #5 would be the preferred option for the proposed US 23 Business widening.***

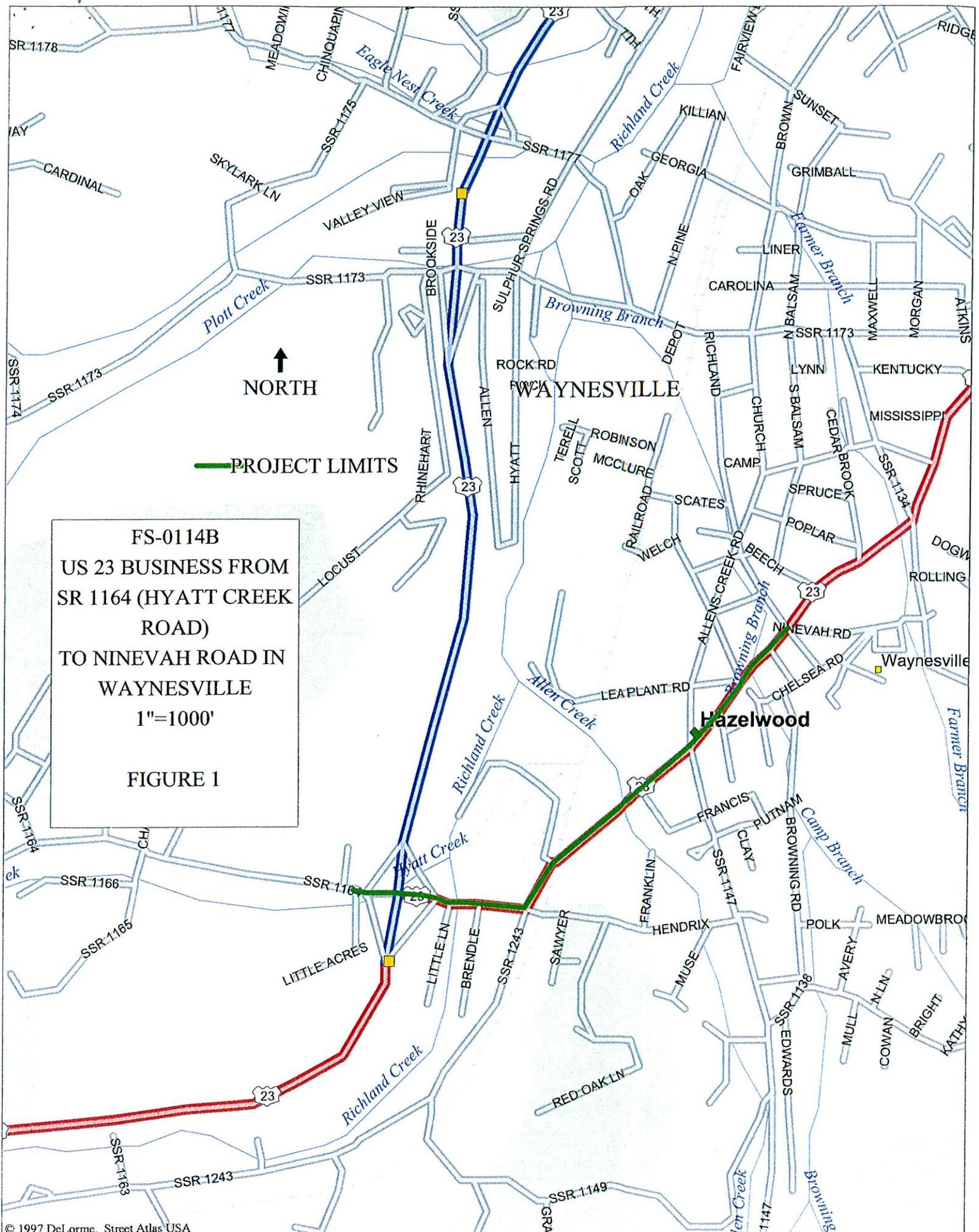
The total cost of the preferred alternative, including the widening of US 23 Business, intersection improvements at Allen's Creek Road and interchange modifications at US 23 Bypass is \$ 27,200,000. Please see the attached table for a comprehensive breakdown of alternatives and costs.

V. Additional Comments

A detailed environmental study was not conducted for this feasibility study. However, existing information available for this area showed only one possible environmental concern: on the northwest corner of SR 1164 (Hyatt Creek Road) and US 23 Business, a DayCo Corporation superfund hazardous waste disposal site has been identified. No other environmental concerns were identified, nor were any impacts to historic properties or wetlands anticipated.

Based on maps at the Department of Environment, Health & Natural Resources and Natural Heritage Section, impacts to threatened or endangered species are not anticipated in the project area.

No special bicycle accommodations were investigated for this project.



FS-0114B
 US 23 BUSINESS FROM
 SR 1164 (HYATT CREEK
 ROAD)
 TO NINEVAH ROAD IN
 WAYNESVILLE
 1"=1000'
 FIGURE 1

FS-0114 B; US 23 BUSINESS FROM SR 1164 (HYATT CREEK ROAD) TO NINEVAH ROAD IN WAYNESVILLE

| DESCRIPTION | LENGTH OF SEGMENT | NO. OF RESIDENTIAL RELOCATIONS | NO. OF BUSINESS RELOCATIONS | RIGHT OF WAY COST | ROADWAY CONSTRUCTION COST | INTERCHANGE CONSTRUCTION COST | TOTAL |
|--|-------------------|--------------------------------|-----------------------------|-------------------|---------------------------|-------------------------------|---------------------|
| ALTERNATIVE #1 - Three-lane curb and gutter section, 40' wide face to face of curbs with 10' berms on 80' right of way | 0.9 miles | 9 | 30 | \$7,700,000 | \$3,300,000 | N/A | \$11,000,000 |
| ALTERNATIVE #2 - Five-lane curb and gutter section, 64' wide face to face of curbs with 10' berms on 100' right of way | 0.9 miles | 11 | 30 | \$9,100,000 | \$5,300,000 | N/A | \$14,400,000 |
| ALTERNATIVE #3 - Four-lane divided curb and gutter section, 70' wide face to face of curbs with 18' raised grass median, 10' berms on 100' right of way | 0.9 miles | 11 | 30 | \$9,100,000 | \$5,900,000 | N/A | \$15,000,000 |
| ALTERNATIVE #4 - Same section as Alternative #2 listed above, INCLUDING INTERCHANGE MODIFICATIONS | 1.2 miles | 11 | 30 | \$11,200,000 | \$6,600,000 | \$6,600,000 | \$24,400,000 |
| ALTERNATIVE #5 - Same section as Alternative #3 listed above, INCLUDING INTERCHANGE MODIFICATIONS | 1.2 miles | 11 | 30 | \$11,200,000 | \$7,400,000 | \$6,600,000 | \$25,200,000 |
| ALLEN'S CREEK ROAD INTERSECTION IMPROVEMENTS - Adding additional right and left turn lanes to accommodate design year traffic | 700 feet | 12 | 2 | \$1,800,000 | \$200,000 | N/A | \$2,000,000 |
| TOTAL COST WITH RECOMMENDED ALTERNATIVE AND INTERSECTION IMPROVEMENTS | | | | | | | \$27,200,000 |

 DENOTES RECOMMENDED ALTERNATIVE OR IMPROVEMENTS