

FEASIBILITY STUDY

Winston-Salem

**Service Road Parallel to I-40 Business (US 421)
From Cherry Street to
the Main Street (NB) Off-ramp
Forsyth County**

Division 9

FS-9909B

u-4021



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

A handwritten signature in black ink, appearing to read "Derrick W. Lewis".

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5/7/99

Date

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I. General Description

This feasibility study describes constructing a parallel service road adjacent to westbound I-40 Business (US 421) from Cherry Street to Main Street, a distance of approximately 900 feet (274.4 m). The project location is shown on Figure 1. Considering that this project is mostly on a new structure, the recommended cross-section is a one-lane (one-way) ramp/service road, 28 feet (8.5 m) wide from face-to-face of curbs between Cherry Street and Main Street. This service road requires an additional 80 feet (24.4 m) of right-of-way on the north side of I-40 Business in order to separate this service road from the freeway to allow for potential future improvements to I-40 Business within this area. It is anticipated that there will be no residences and one business relocated due to this project. The total cost of the project, including construction and right-of-way, is estimated to be \$5,200,000.00.

Construction.....	\$ 3,700,000
Right-of-way.....	\$ 1,500,000
Total Cost	\$ 5,200,000

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. Need for Project

The purpose of this project is to provide a ramp/service road parallel to westbound I-40 Business in order to allow the removal of the Main Street on-ramp and Cherry Street off-ramp. Under this project, the Liberty Street on-ramp onto I-40 westbound would be retained and grade separated by the proposed service road. This will greatly simplify the complex weave situation, which currently exists. This project was requested by the Division Engineer's office. The Winston-Salem Forsyth Urban Area MPO supports this project.

I-40 Business is designated as a freeway/expressway in the Winston-Salem Thoroughfare Plan and as a freeway/expressway in the North Carolina Statewide Functional Classification System.

Currently, the Main Street westbound on-ramp enters I-40 Business with no acceleration lane approximately 200 feet (61.0 m) from the Liberty Street on-ramp. In addition, the Liberty Street on-ramp and Cherry Street off-ramp form a simple weave section which is only 170 feet (51.8 m) in length. These three ramps together form what could be considered a very complex and undesirable merge/weave condition.

The Winston-Salem central business district is along the north side of I-40 Business in the project area. There are existing traffic signals at the Main Street / westbound I-40 Business on/off ramp intersection.

TIP Project U-2827 will rehabilitate the pavement and provide safety improvements to I-40 Business within the project area including the freeway structure over Liberty Street (Bridge No. 312). It is currently scheduled for right-of-way acquisition in October 1999, and for construction in October 2000.

No bicycle provisions are currently recommended on this project.

The estimated 1998 Average Daily Traffic (ADT) along the proposed parallel service is 3000 vehicles per day (vpd) between Cherry Street and Main Street while the Main Street off-ramp has an estimated 6300 vpd. For the design year 2025, the estimated traffic volumes on the parallel service road is 5100 vpd between Cherry Street and Main Street while the Main Street off-ramp has an estimated 10,600 vpd. Truck traffic along the parallel service road is estimated to make up three percent of daily traffic. The 1998 ADT on I-40 Business just east of the Main Street off-ramp is 63,300 vpd. For the design year 2025, the estimated traffic volume for I-40 Business is 97,800 vpd.

If no improvements are provided, this section of I-40 Business operates at a Level of Service (LOS) F for both the current year and 2025 design year. With this parallel service road in place, this section of I-40 Business is expected to function with a LOS F in both the current and 2025 design years. If I-40 Business is widened in the future, but the parallel service road is not provided, this section of I-40 Business will operate at LOS F in the current year and in the 2025 design year. However, if I-40 Business is widened (six-lane freeway) in the future and the parallel service road is in place, this section of I-40 Business should operate at LOS C in the current year and at LOS D in the design year 2025. The parallel service road is expected to function at LOS C in both the current and 2025 design years.

During the three-year period from May 1995 through April 1998, there were 164 accidents reported on I-40 Business between the Main Street off-ramp and the Marshall Street on-ramp. There were 77 injuries reported as a result of these accidents, but no fatalities. The accident rate along this section of I-40 Business is 938 accidents per 100 million vehicle miles (acc/100mvm). This compares with the 1995 to 1997 statewide rate of 157 acc/100mvm for Urban Interstate Routes.

III. Recommendations / Description of Project

It is recommended to construct a one-way service road parallel to I-40 Business (westbound) a distance of 900 feet (274.4 m) in order to permit the removal of the Main Street on-ramp and Cherry Street off-ramp. The project location is shown on Figure 1.

This proposed parallel service road is technically a one-way directional ramp for I-40 Business. In addition, most of the project is comprised of a new structure that is approximately 28 feet (8.5 m) wide, from face-to-face of curbs, and 884 feet (269.5 m) in length. The 28-foot (8.5-m) wide cross section includes a 14-foot (4.2-m) travel lane, a 10-foot (3.0-m) outside shoulder, and a 4-foot (1.2 m) inside shoulder.

The I-40 Business westbound off-ramp will need to be realigned to intersect the proposed parallel service road. In addition, this off-ramp approach will need to be widened to provide one thorough lane and one right turn lane. The Liberty Street on-ramp onto I-40 Business will be retained and grade separated from the proposed service road.

This service road requires an additional 80 feet (24.4 m) of right-of-way on the north side of I-40 Business in order to separate this service road from I-40 Business to allow for potential future improvements to the freeway within this area.

It is anticipated that there will be no residences and one business relocated due to this project. The total cost of the project, including construction and right-of-way, is estimated to be \$5,200,000.00.

Construction.....	\$ 3,700,000
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Total Cost	\$ 5,200,000

A transportation benefit analysis was not completed for this project because the proposed improvements are beyond the capabilities of the benefit analysis package developed by the Statewide Planning Branch. As it currently exists, the Main Street on-ramp, Liberty Street on-ramp and Cherry Street off-ramp all enter and/or exit westbound I-40 Business within a 450 feet

(137.2 m) of roadway. Therefore, a major benefit of this project is the ability to improve traffic safety of I-40 Business by removing this complex and dangerous merge/weave condition.

IV. Other Alternates Considered

The original request from the Division Engineer asked for the project limits to be from Main Street to Marshall Street. However, two properties on the National Register of Historic places are located adjacent to northbound I-40 Business between Cherry Street and Marshall Street. The two historic properties are the James Mitchell Rogers House (#793) and the Conrad Starbuck House (#1541). It is not possible to construct a facility parallel to westbound I-40 Business in this area without severely impacting these properties. Therefore, a detailed study of the section between Cherry Street and Marshall Street is not included in this report.

V. Additional Comments

An environmental screening was not conducted for this study. However, no impacts to historic properties or wetlands are anticipated.

There is a property adjacent to the project limits listed on the National Register of Historic Places. The James Mitchell Rogers House (#793) and Conrad Starbuck House (#1541) are located in the block bordered by Cherry Street, Marshall Street, I-40 Business and First Street. No impact to these structures is anticipated as a part of this project. However, it should be noted that this project will impact the Winston Salem Strollway.