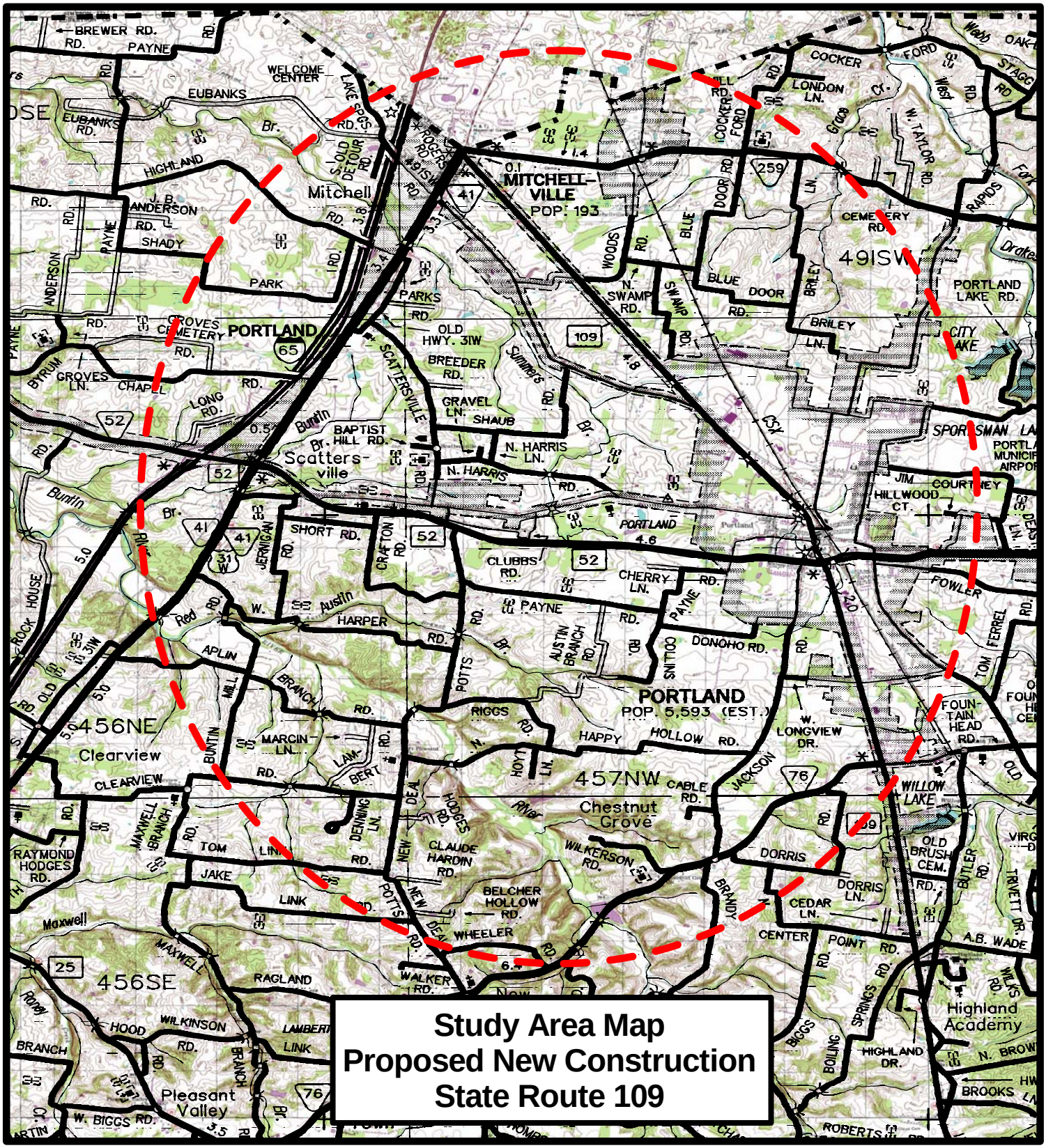
TRANSPORTATION PLANNING REPORT

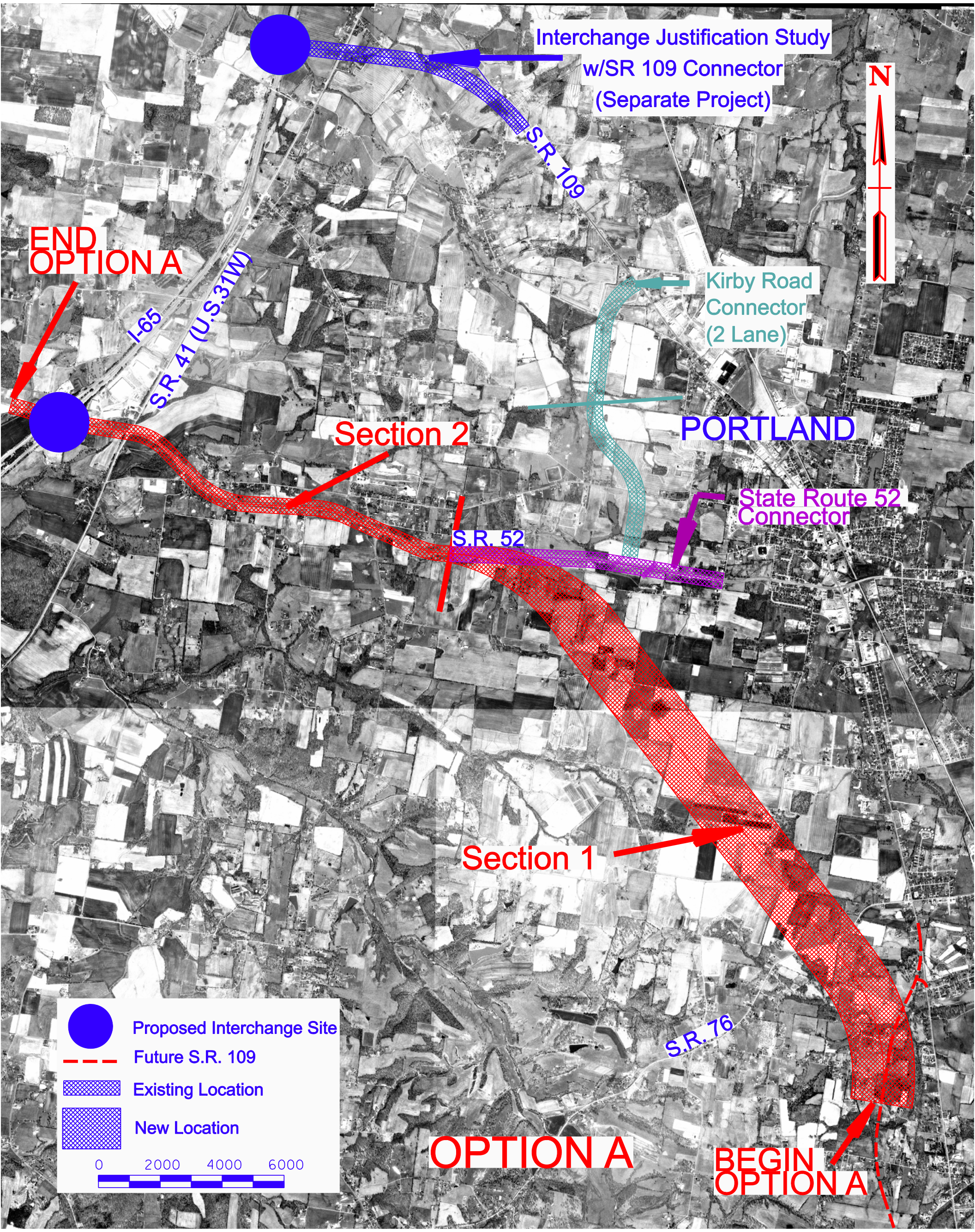
PROPOSED CONNECTOR

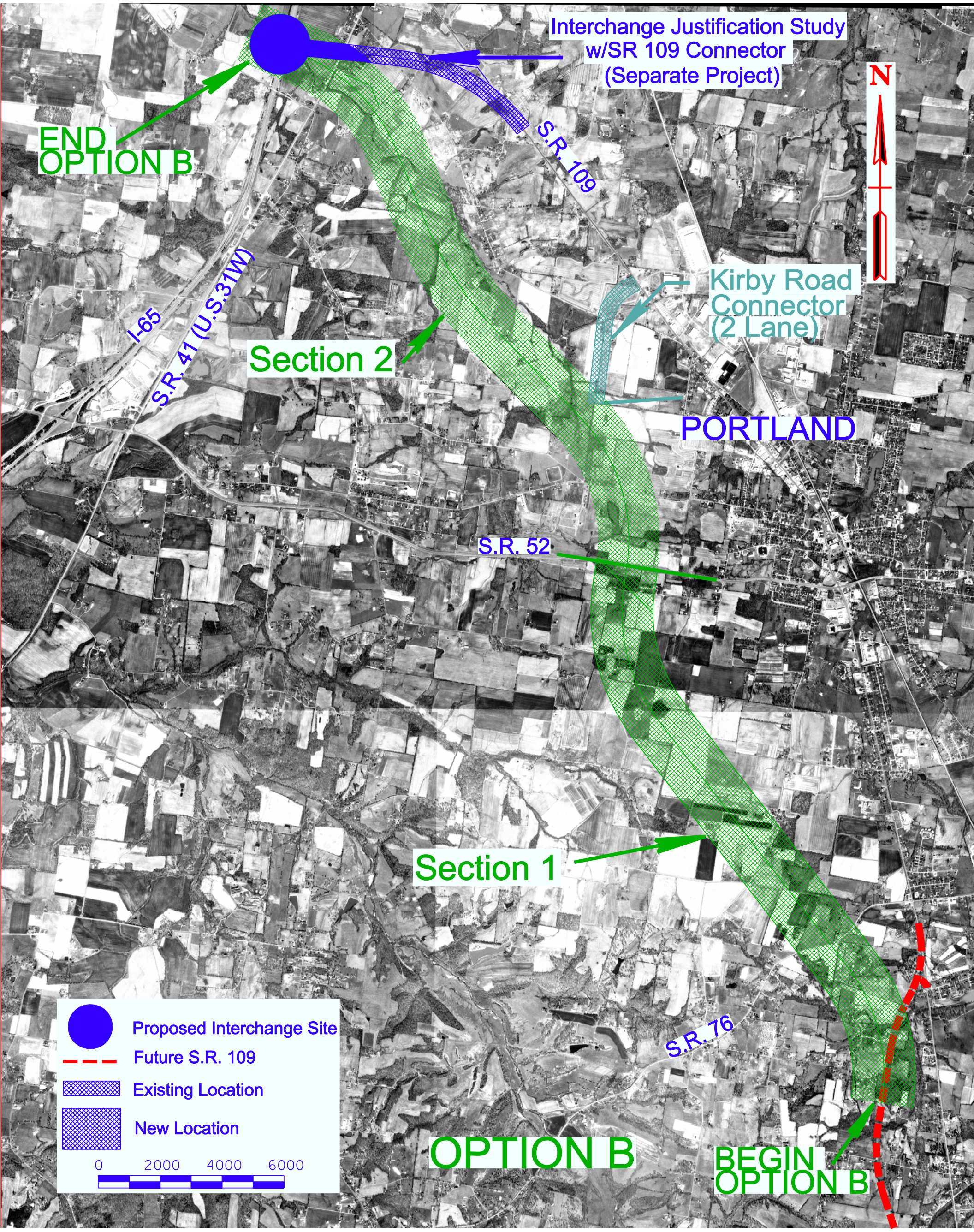
FROM PROPOSED STATE ROUTE 109
SOUTH OF PORTLAND TO I-65
SUMNER AND ROBERTSON COUNTIES
PIN# 106634.00

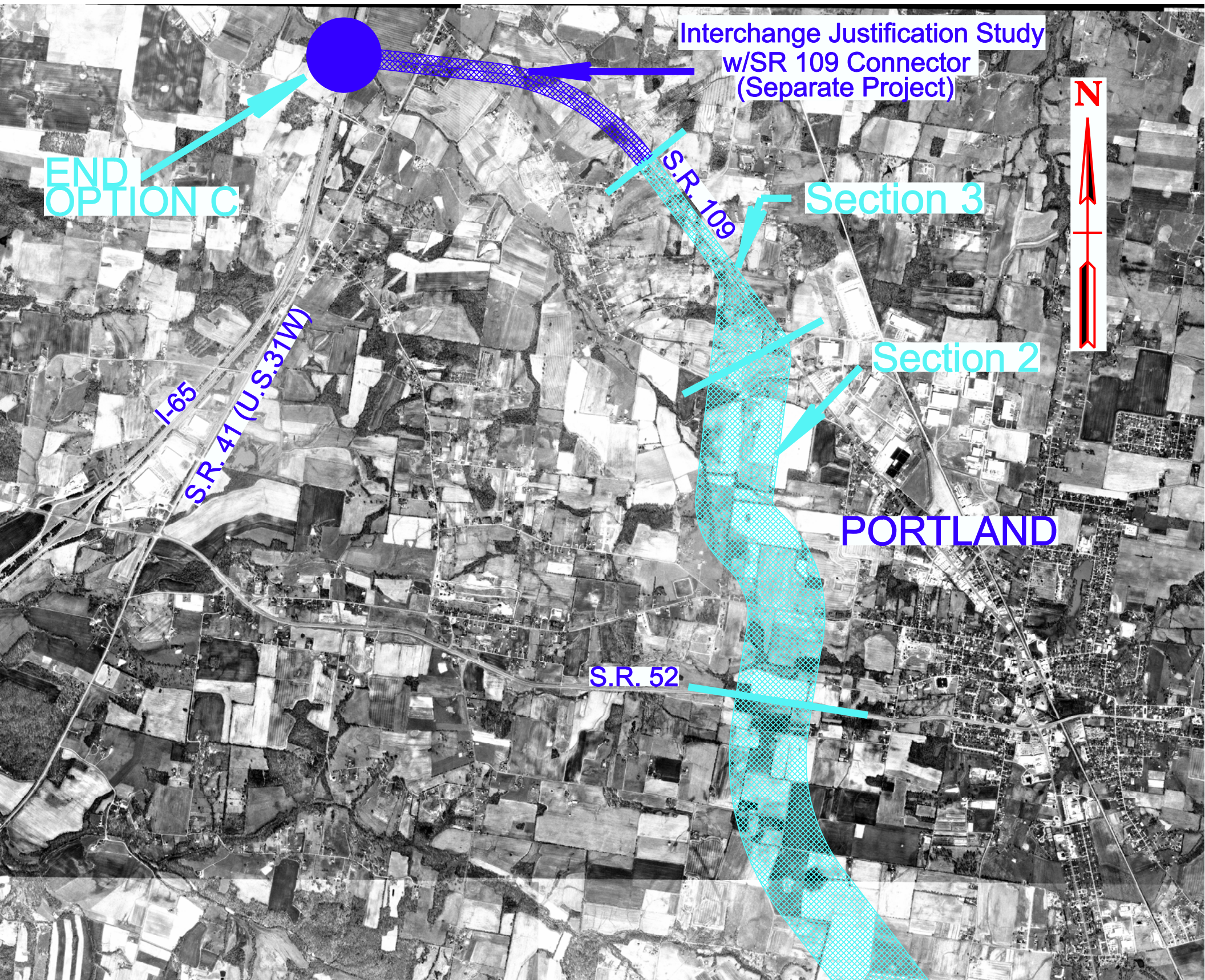
PREPARED BY
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING	Ed Cole	8/31/06
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION	Steve Allen	8-31-06
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION	Bill Hunt	8.31.06


Study Area Map
Proposed New Construction
State Route 109
PORTLAND
POP. 5,593 (EST.)
MITCHELL-VILLE
POP. 193
Scatters-ville
Clearview
Chestnut Grove
Pleasant Valley
Highland Academy
456NE
456SE
457NW
0 1 2 3 4 5
Miles
N
W
E
S


Interchange Justification Study
w/SR 109 Connector
(Separate Project)
S.R. 109
N
END
OPTION A
I-65
S.R. 41 (U.S.31W)
Kirby Road
Connector
(2 Lane)
PORTLAND
Section 2
State Route 52
Connector
S.R. 52
Section 1
S.R. 76
Proposed Interchange Site
Future S.R. 109
Existing Location
New Location
0
2000
4000
6000
OPTION A
BEGIN
OPTION A


Interchange Justification Study
w/SR 109 Connector
(Separate Project)
END
OPTION B
S.R. 109
N
I-65
S.R. 41 (U.S.31W)
Section 2
Kirby Road
Connector
(2 Lane)
PORTLAND
S.R. 52
Section 1
S.R. 76
OPTION B
BEGIN
OPTION B
Proposed Interchange Site
Future S.R. 109
Existing Location
New Location
0
2000
4000
6000


Interchange Justification Study
w/SR 109 Connector
(Separate Project)
END
OPTION C
S.R. 109
Section 3
Section 2
N
I-65
S.R. 41 (U.S.31W)
PORTLAND
S.R. 52
Section 1
S.R. 76
OPTION C
BEGIN
OPTION C
Proposed Interchange Site
Future S.R. 109
Existing Location
New Location
0
2000
4000
6000

DATA TABLE
State Route 109
Sumner County

No Build Option
From: SR-76 **EXISTING CONDITIONS**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	**Urban Principal Arterial**
System Class	**STP**
Length - Miles	**6.78**
Cross Section Feet	**22/28-32/100(2 lane) & 40-48/44-60/56-100(4 lane)**
Present ADT (2011)	**13,945**
Projected Future ADT (2031)	**22,315**
Percent Trucks	**12%**
Estimated Right-of-Way Acquisition (Acres)	**N/A**
Estimated Right-of-Way Tracts Affected	**N/A**
Estimated Business Displacements	**N/A**
Estimated Right-of-Way Cost	**$ N/A**
Estimated Utility Cost Reimbursable	**$ N/A**
Estimated Utility Cost Non-Reimbursable	**$ N/A**
Estimated Construction Cost	**$ N/A**
Estimated Preliminary Engineering Cost	**$ N/A**
Total Estimated Section Cost	**$ N/A**

*State Route 109 has a variable 4 lane section for 1.5 miles from Summer St. to Morningside Dr. in Portland.

DATA TABLE
State Route 52
Sumner County

No Build Option
From: I-65 **EXISTING CONDITIONS**
To: Existing 5 lane at Market St.

Item	
Functional Class	**Urban\Rural Principal Arterial**
System Class	**STP**
Length - Miles	**4.33**
Cross Section Feet	**24 / 42-46 / 100-150**
Present ADT (2011)	**11,200***
Projected Future ADT (2031)	**21,700***
Percent Trucks	**10%***
Estimated Right-of-Way Acquisition (Acres)	**N/A**
Estimated Right-of-Way Tracts Affected	**N/A**
Estimated Business Displacements	**N/A**
Estimated Right-of-Way Cost	**$ N/A**
Estimated Utility Cost Reimbursable	**$ N/A**
Estimated Utility Cost Non-Reimbursable	**$ N/A**
Estimated Construction Cost	**$ N/A**
Estimated Preliminary Engineering Cost	**$ N/A**
Total Estimated Section Cost	**$ N/A**

*Number is Averaged

DATA TABLE
State Route 109
Sumner County

OPTION A, B, & C Section 1
From: Near SR-76 **PROPOSED**
To: SR-52

Item	
Functional Class	**Urban/Rural Principal Arterial**
System Class	**STP**
Length - Miles	**3.79**
Cross Section Feet	**48 / 124 / 250**
Present ADT (2011)	**2,930**
Projected Future ADT (2031)	**4,400**
Percent Trucks	**7%**
Estimated Right-of-Way Acquisition (Acres)	**110.48**
Estimated Right-of-Way Tracts Affected	**9**
Estimated Business Displacements	**0**
Estimated Right-of-Way Cost	**$ 4,283,000**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 568,500**
Estimated Construction Cost	**$ 12,510,000**
Estimated Preliminary Engineering Cost	**$ 935,000**
Total Estimated Section Cost	**$ 18,296,500**

DATA TABLE
State Route 52
Sumner County

OPTION A Section 2
From: New Deal Potts Road
To: I-65

Item	**PROPOSED**
Functional Class	**Urban/Rural Principal Arterial**
System Class	**STP**
Length - Miles	**4.61**
Cross Section Feet	**48 / 124 / 250**
Present ADT (2011)	**15,500**
Projected Future ADT (2031)	**24,050**
Percent Trucks	**10%**
Estimated Right-of-Way Acquisition (Acres)	**75.94**
Estimated Right-of-Way Tracts Affected	**6**
Estimated Business Displacements	**2**
Estimated Right-of-Way Cost	**$ 5,701,000**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 5,735,500**
Estimated Construction Cost	**$ 18,620,000**
Estimated Preliminary Engineering Cost	**$ 1,390,000**
Total Estimated Section Cost	**$ 31,446,500**

DATA TABLE
State Route 52
Sumner County

OPTION A SR-52 Connector
From: Existing 5 lane at Market St. (SR-52) **PROPOSED**
To: Near New Deal Potts Rd.

Item	
Functional Class	Urban Principal Arterial
System Class	STP
Length - Miles	1.68
Cross Section Feet	48 / 124 / 250
Present ADT (2011)	10,080
Projected Future ADT (2031)	15,750
Percent Trucks	11%
Estimated Right-of-Way Acquisition (Acres)	20.37
Estimated Right-of-Way Tracts Affected	2
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 4,283,000
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 1,428,000
Estimated Construction Cost	$ 5,420,000
Estimated Preliminary Engineering Cost	$ 405,000
Total Estimated Section Cost	$ 11,536,000

DATA TABLE
State Route 109
Sumner County

OPTION A Kirby Connector
From: SR-52 **PROPOSED**
To: North of College St. (Kirby Road Connector)

Item	
Functional Class	**Urban Local Road**
System Class	**STP**
Length - Miles	**1.90**
Cross Section Feet	**24 / 48 / 150**
Present ADT (2011)	**5,210**
Projected Future ADT (2031)	**7,300**
Percent Trucks	**10%**
Estimated Right-of-Way Acquisition (Acres)	**57.26**
Estimated Right-of-Way Tracts Affected	**1**
Estimated Business Displacements	**0**
Estimated Right-of-Way Cost	**$ 1,203,000**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 285,000**
Estimated Construction Cost	**$ 3,950,000**
Estimated Preliminary Engineering Cost	**$ 295,000**
Total Estimated Section Cost	**$ 5,733,000**

DATA TABLE
State Route 109 and State Route 52
Sumner County

OPTION A Total Cost: Sections 1,2, & SR-52 Connector
From: Near SR-76 **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	Urban/Rural Principal Arterial
System Class	STP
Length - Miles	10.08
Cross Section Feet	48 / 124 / 250
Present ADT (2011)	10,700*
Projected Future ADT (2031)	19,560*
Percent Trucks	10%*
Estimated Right-of-Way Acquisition (Acres)	69*
Estimated Right-of-Way Tracts Affected	6*
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 14,267,000
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 7,732,000
Estimated Construction Cost	$ 36,550,000
Estimated Preliminary Engineering Cost	$ 2,730,000
Total Estimated Section Cost	$ 61,279,000

*Number is Averaged

DATA TABLE
State Route 109 and State Route 52
Sumner County

OPTION A Total Cost: Sect. 1,2, & SR-52 Connector w/Kirby Rd. Connector
From: Near SR-76 **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	Urban/Rural Principal Arterial
System Class	STP
Length - Miles	11.97
Cross Section Feet	48 / 124 / 250 & 24 / 48 / 150
Present ADT (2011)	9,600*
Projected Future ADT (2031)	17,100*
Percent Trucks	10%*
Estimated Right-of-Way Acquisition (Acres)	66*
Estimated Right-of-Way Tracts Affected	5*
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 15,470,000
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 8,017,000
Estimated Construction Cost	$ 40,500,000
Estimated Preliminary Engineering Cost	$ 3,025,000
Total Estimated Section Cost	$ 67,012,000

*Number is Averaged

DATA TABLE
State Route 109
Sumner County

OPTION B Section 2
From: SR-52 **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	Urban Principal Arterial
System Class	STP
Length - Miles	4.18
Cross Section Feet	48 / 124 / 250
Present ADT (2011)	5,210
Projected Future ADT (2031)	7,300
Percent Trucks	10%
Estimated Right-of-Way Acquisition (Acres)	126.60
Estimated Right-of-Way Tracts Affected	4
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 3,295,000
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 627,000
Estimated Construction Cost	$ 14,155,000
Estimated Preliminary Engineering Cost	$ 1,055,000
Total Estimated Section Cost	$ 19,132,000

DATA TABLE
State Route 109
Sumner County

OPTION B Kirby Connector
From: North of College St.
To: SR-109 (Kirby Road Connector)

Item	**PROPOSED**
Functional Class	**Urban Local Road**
System Class	**STP**
Length - Miles	**0.87**
Cross Section Feet	**24 / 48 / 150**
Present ADT (2011)	**5,210**
Projected Future ADT (2031)	**7,300**
Percent Trucks	**10%**
Estimated Right-of-Way Acquisition (Acres)	**26.34**
Estimated Right-of-Way Tracts Affected	**1**
Estimated Business Displacements	**0**
Estimated Right-of-Way Cost	**$ 553,380**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 130,500**
Estimated Construction Cost	**$ 1,930,000**
Estimated Preliminary Engineering Cost	**$ 145,000**
Total Estimated Section Cost	**$ 2,758,880**

DATA TABLE
State Route 109
Sumner County

OPTION B Total Cost: Sections 1 & 2
From: Near SR-76 **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	**Urban/Rural Principal Arterial**
System Class	**STP**
Length - Miles	**7.97**
Cross Section Feet	**48 / 124 / 250**
Present ADT (2011)	**10,700***
Projected Future ADT (2031)	**19,560***
Percent Trucks	**10%***
Estimated Right-of-Way Acquisition (Acres)	**69***
Estimated Right-of-Way Tracts Affected	**6***
Estimated Business Displacements	**0**
Estimated Right-of-Way Cost	**$ 7,578,000**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 1,195,500**
Estimated Construction Cost	**$ 26,665,000**
Estimated Preliminary Engineering Cost	**$ 1,990,000**
Total Estimated Section Cost	**$ 37,428,500**

*Number is Averaged

DATA TABLE
State Route 109
Sumner County

OPTION B Total Cost: Sect. 1,2, & Kirby Rd. Connector
From: Near SR-76 **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	Urban/Rural Principal Arterial
System Class	STP
Length - Miles	8.84
Cross Section Feet	48 / 124 / 250 & 24 / 48 / 150
Present ADT (2011)	7,020*
Projected Future ADT (2031)	12,470*
Percent Trucks	13%*
Estimated Right-of-Way Acquisition (Acres)	88*
Estimated Right-of-Way Tracts Affected	5*
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 8,131,380
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 1,326,000
Estimated Construction Cost	$ 28,595,000
Estimated Preliminary Engineering Cost	$ 2,135,000
Total Estimated Section Cost	$ 40,184,830

*Number is Averaged

DATA TABLE
State Route 109
Sumner County

OPTION C Section 2
From: SR-109 **PROPOSED**
To: SR-52 (Kirby Road Connector)

Item	
Functional Class	Urban Principal Arterial
System Class	STP
Length - Miles	1.89
Cross Section Feet	48 / 124 / 250
Present ADT (2011)	5,210
Projected Future ADT (2031)	7,300
Percent Trucks	10%
Estimated Right-of-Way Acquisition (Acres)	57.27
Estimated Right-of-Way Tracts Affected	2
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 1,693,190
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 283,500
Estimated Construction Cost	$ 6,370,000
Estimated Preliminary Engineering Cost	$ 475,000
Total Estimated Section Cost	$ 8,821,690

DATA TABLE
State Route 109
Sumner County

OPTION C Section 3
From: Kirby Rd. **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	Urban/Rural Principal Arterial
System Class	STP
Length - Miles	1.21
Cross Section Feet	48 / 124 / 250
Present ADT (2011)	12,230
Projected Future ADT (2031)	19,570
Percent Trucks	16%
Estimated Right-of-Way Acquisition (Acres)	14.71
Estimated Right-of-Way Tracts Affected	18
Estimated Business Displacements	0
Estimated Right-of-Way Cost	$ 3,598,000
Estimated Utility Cost Reimbursable	$ 0
Estimated Utility Cost Non-Reimbursable	$ 1,028,500
Estimated Construction Cost	$ 4,775,000
Estimated Preliminary Engineering Cost	$ 355,000
Total Estimated Section Cost	$ 9,756,500

DATA TABLE
State Route 109
Sumner County

OPTION C Sections 1,2, & 3 Total Cost
From: Kirby Rd. **PROPOSED**
To: I-65 (Collins Park Interchange)

Item	
Functional Class	**Urban/Rural Principal Arterial**
System Class	**STP**
Length - Miles	**6.89**
Cross Section Feet	**48 / 124 / 250**
Present ADT (2011)	**7,470***
Projected Future ADT (2031)	**13,760***
Percent Trucks	**13%***
Estimated Right-of-Way Acquisition (Acres)	**61***
Estimated Right-of-Way Tracts Affected	**10***
Estimated Business Displacements	**0**
Estimated Right-of-Way Cost	**$ 9,574,190**
Estimated Utility Cost Reimbursable	**$ 0**
Estimated Utility Cost Non-Reimbursable	**$ 1,880,500**
Estimated Construction Cost	**$ 23,655,000**
Estimated Preliminary Engineering Cost	**$ 1,765,000**
Total Estimated Section Cost	**$ 36,874,690**

*Number is Averaged

PROJECT DATA TABLE

STATE ROUTE 109

	APPROXIMATE LENGTH	PROPOSED IMPROVEMENT	2011 AVERAGE DAILY TRAFFIC	2031 AVERAGE DAILY TRAFFIC	PERCENT TRUCKS	2031 LEVEL OF SERVICE	R.O.W COST	UTILITY RELOCATION COST	CONSTRUCTION COST	PRELIMINARY ENGINEERING COST	TOTAL COST
OPTION A,B,C											
SECTION 1	3.79	4 LANE	2,930	4,400	7	A	$4,283,000	$568,500	$12,510,000	$935,000	$18,296,500
NO-BUILD	3.79	NONE	15,660	25,060	7	E	N/A	N/A	N/A	N/A	N/A
OPTION A											
SECTION 2	4.61	4 LANE	15,500	24,050	10	C	$5,701,000	$5,735,500	$18,620,000	$1,390,000	$31,446,500
NO-BUILD	4.61	NONE	13,220	21,150	9	D	N/A	N/A	N/A	N/A	N/A
OPTION A											
SR-52 CONNECTOR	1.68	4 LANE	10,080	15,750	11	B	$4,283,000	$1,428,000	$5,420,000	$405,000	$11,536,000
NO-BUILD	1.68	NONE	13,220	21,150	9	E	N/A	N/A	N/A	N/A	N/A
OPTION B											
SECTION 2	4.18	4 LANE	5,210	7,300	10	A	$3,295,000	$627,000	$14,155,000	$1,055,000	$19,132,000
NO-BUILD	4.18	NONE	12,230	19,570	16	E	N/A	N/A	N/A	N/A	N/A
OPTION C											
SECTION 2	1.89	4 LANE	5,210	7,300	10	A	$1,693,190	$283,500	$6,370,000	$475,000	$8,821,690
NO-BUILD	1.89	NONE	12,230	19,570	16	E	N/A	N/A	N/A	N/A	N/A
OPTION A											
KIRBY CONNECTOR	1.90	2 LANE CONNECTOR	5,210	7,300	10	B	$1,203,000	$285,000	$3,950,000	$295,000	$5,733,000
NO-BUILD	1.90	NONE	13,220	21,150	11	E	N/A	N/A	N/A	N/A	N/A
OPTION B											
KIRBY CONNECTOR	0.87	2 LANE CONNECTOR	5,210	7,300	10	B	$553,380	$130,500	$1,930,000	$145,000	$2,758,880
NO-BUILD	0.87	NONE	12,230	19,570	16	E	N/A	N/A	N/A	N/A	N/A
OPTION C											
SECTION 3	1.21	4 LANE	12,230	19,570	16	C	$3,598,000	$1,028,500	$4,775,000	$355,000	$9,756,500
NO-BUILD	1.21	NONE	12,230	19,570	16	E	N/A	N/A	N/A	N/A	N/A
TOTAL											
OPTION A	10.08						$14,267,000	$7,732,000	$36,550,000	$2,730,000	$61,279,000
OPT. A W/KIRBY	11.97						$15,740,000	$8,017,000	$40,500,000	$3,025,000	$67,012,000
OPTION B	7.97						$7,578,000	$1,195,500	$26,665,000	$1,990,000	$37,248,500
OPT. B W/KIRBY	8.84						$8,131,380	$1,326,000	$28,595,000	$2,135,000	$40,184,830
OPTION C	6.89						$9,574,190	$1,880,500	$23,655,000	$1,765,000	$36,874,690

*Figures based on 4 Lane Rural Principal Arterial for comparative purposes

EXISTING CONDTIONS

State Route 109 in Sumner County was completed and added to the state road system on February 15, 1929. It begins at the Wilson County line terminating at State Route 41/Robertson County line, a total distance of approximately 23.45 miles. As a result of public involvement and input, three options were prepared for this report. The proposed project area varies in length depending on the option selected. Option A, is approximately 10.08 miles without a Kirby Road connector, and 11.97 miles in length with a Kirby Road connector. Option B, is approximately 7.97 without a Kirby Road connector, and 8.84 miles in length with a Kirby Road connector. Option C, is approximately 6.89 miles in length. These options are based within selected corridors and will be further evaluated under future studies for horizontal and vertical alignment, right-of-way, utility adjustments, environmental mitigations and structures. With the exception of a 1.5 mile variable four-lane segment from Summer Street to near Morningside Drive, the majority of this route consists of a standard two-lane cross section with three foot shoulders. The route is lacking in shoulder width and sidewalks, thereby inhibiting pedestrian and bicycle traffic.

These options do not include the interchange at I-65 and Collins Industrial Park or the proposed connector to Interstate 65; it is part of a separate project. The proposed Kirby Road connector to State Route 109 was developed as a two-lane connector for Options A and B. The cost for Options A and B were calculated with and without the two-lane Kirby Road connector. Kirby Road is connected to State Route 52 in Option C as a four-lane arterial. Options A and B were prepared this way because local officials have expressed a desire for a Kirby Road connector no matter which option is ultimately selected. The cost for Options A, B and C are based on the presumption that the interchange at Interstate 65 and Collins Industrial Park are constructed prior to these options being built.

The base year (2011) average daily traffic (ADT) along this route ranges from a low of 7,240 near Interstate 65 to a high of 13,940 between State Route 52 and State Route 41. CSX Railway currently provides freight service for area industry. Trucking is also a dominant means for moving goods to and from local businesses and industry. Using the base years 2002 through 2004 average daily traffic and the calculated vehicle miles of travel, a crash rate (crashes per one million vehicle miles) was calculated for the existing route. Using the average daily traffic for State Route 109 of 13,600, a crash rate of 1.71, and a critical crash rate of 2.87 was calculated. This can be compared to the statewide average rate for these years of 2.51. Although the actual crash rates are below the statewide average, there are existing safety concerns which will likely worsen as traffic volumes increase.

COMMUNITY PROFILE

Portland was originally called Richland. In 1859, the Louisville & Nashville (L & N) Railroad opened the Nashville-Bowling Green route through Portland. A train depot was built in Richland along the L & N in 1859 on land owned by Thomas Buntin, and he became the depot's first agent and Richland's first postmaster. The Richland community developed around the depot. By 1887, there were two Richland's in Tennessee. This caused some concern from the railroad that a telegraph mix-up could cause a train wreck, and mail was also getting mixed up between the two Richland's. Railroad officials and postal authorities decided that Richland would become Portland. The name was officially changed on April 10, 1888. The City of Portland was incorporated in 1904 by the Tennessee General Assembly. In the 1920s, strawberries became very important to Portland's economy. Beginning in 1941 and continuing to the present, Portland has hosted an annual Strawberry Festival in Middle Tennessee to celebrate and remember the importance of the strawberry industry to its heritage.

The population of Sumner County in the 2000 census was 130, 449, where the City of Portland is located. Portland is a rural community of 10,046 residents according to a 2004 special census conducted by the city. The population in Portland has increased approximately 20% since the 2000 census. The unemployment rate in Portland is 4.4%, which is lower than the statewide average of 5.2% for Tennessee. The city is located in northern middle Tennessee, just five miles south of Kentucky and thirty-five miles north of Nashville. A large industrial park north of Portland is located on the east side of State Route 109 at Kirby Road. Interstate 65 is only five miles west of the city, and has aided in the industrial development of the area.

Portland has over 50 industries that comprise distribution, warehousing, and manufacturing involving a wide range of products. Some of the larger companies are Macy's/Bloomingdale's, CAT Logistics, Sofa Express, and Portland Utilities Constructions. The primary farming commodities in Sumner County include livestock, horses, hay, soybeans, tobacco, corn and wheat for grain. Despite these assets, the area leaders are eager to attract new industry to Portland and Sumner County to spur job growth.

The City of Portland has seen an increase in commercial and industrial development along State Route 109 that has increased traffic demand along the route. The traffic generators can be separated into three land use categories: 1) industrial or manufacturing, 2) retail, 3) educational or institutional.

PURPOSE AND NEED OF STUDY

The purpose of this study is to analyze existing and projected data to determine the feasibility of improving access from proposed relocated State Route 109 south of Portland to Interstate 65. This study was initiated at the request of the City of Portland. The objective of this report is to develop options for improvement and estimate the cost of project implementation. This study was initiated due to the growth of new industry and the inherent increase of truck and employee traffic in and around Portland's downtown and industrial park areas.

Currently, trucks account for 16% of the traffic on State Route 109 in the downtown and industrial park areas. Heavy trucks and vehicles now wishing to travel between the termini of the proposed project must utilize existing State Route 109 through the signalized business district of Portland. It will also provide truckers and motorists with an option to bypass downtown Portland. This project would also complete a corridor plan connecting Interstate 40 in Wilson County to Interstate 65 in Robertson County that is identified in the 10 year Strategic Investments Program. Also, this project would address future transportation needs that would have been handled by State Route 840 north if that project had not been eliminated.

The primary need on State Route 109 in Sumner County is for improved regional and statewide mobility. Several specific needs are encompassed in this broad goal:

1. Provide a north/south route to serve demand for regional accessibility to the interstate highway system and protect that provision in the future.
2. Allow additional economic growth in the City of Portland and Sumner County by providing improvement to the transportation system.
3. Reduce the density of traffic on existing State Route 109 in order to improve safety and mobility.
4. Provide an alternate route to reduce the amount of truck traffic on existing State Route 109, especially the section from the Collins Industrial Park through the City of Portland.

Addressing transportation needs through corridor planning offers many benefits and represents a new way of identifying transportation improvements throughout the state. Rather than planning on a project-by-project basis, corridor planning allows TDOT to look at a larger area and develop creative, collaborative and long-term solutions to traffic flow issues. Projects developed through corridor planning offer more transportation choices and are more financially responsible in a time of limited resources at all levels of government. The 10 year Strategic Investment Plan is intended to jumpstart key pieces of the 25 year vision plan which is discussed in detail in the Long Range Transportation Plan (LRTP).

The LRTP looks at multimodal approaches to meet the increasing transportation needs in Tennessee for the next 25 years. It describes what type of transportation system we will have in the future and provides policy direction for investments and operating decisions. Each of the six primary modes of transportation (aviation, bicycle/pedestrian, highway, public transportation, rail and waterways) was examined for current use, future travel and freight demands and the condition of the system.

The need for route improvement can be quantified by a "Level of Service" (LOS) analysis. The proficiency of roads are described by their LOS. The criteria are defined as shown in the "Level of Service" section of this report and reflect the relative ability of roads to accommodate motor vehicle traffic and subsequent physical and psychological comfort levels of drivers. The LOS analysis incorporates several factors including traffic volumes, number of lanes, terrain, percent of no passing zones, directional split, heavy vehicles, and shoulder widths. The projected traffic volumes for the base and design years are depicted in the Project Data Table and on the traffic schematic included in this report.

LEVEL OF SERVICE

LOS is a qualitative measure that describes traffic conditions related to speed and travel time, freedom to maneuver, traffic interruptions, etc. There are six levels ranging from "A" to "F" with "F" being the worst. Each level represents a range of operating conditions. General descriptions of operating conditions for each of the levels of service are as follows:

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonably free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is still high.
C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension because of the additional vigilance required for safe operation.

D Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.

E At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

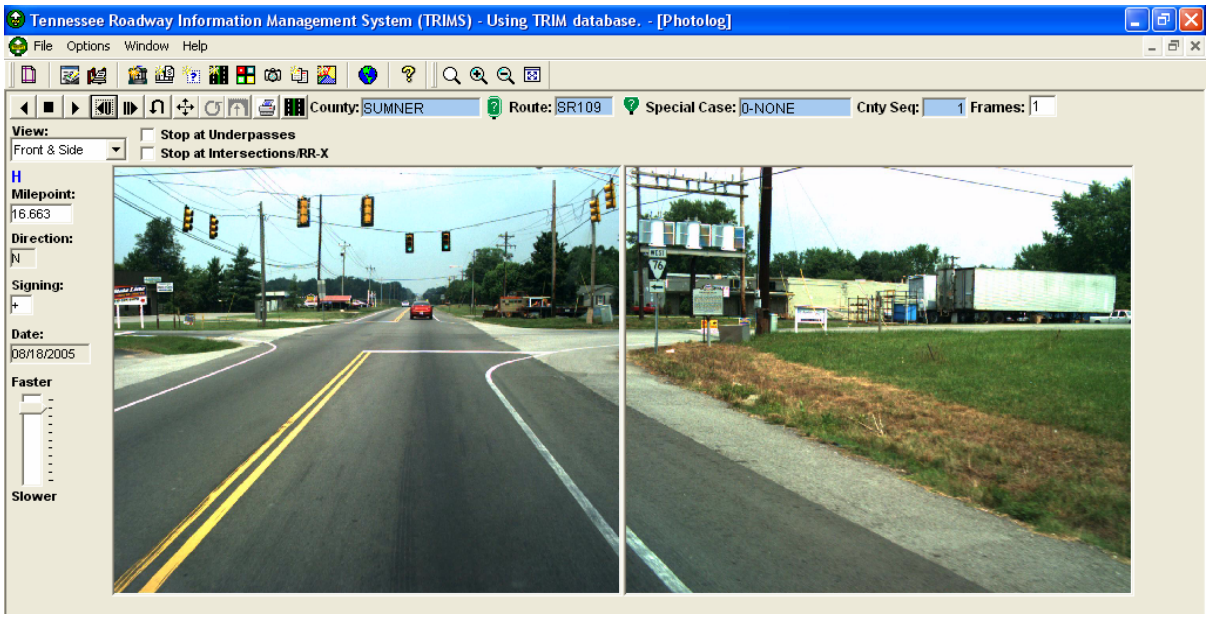
F Breakdowns in traffic flow. The number of vehicles entering the highway section exceed the capacity or ability of the highway to accommodate that number of vehicles. There is little or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

The LOS analysis completed for this route utilized the projected design year (2031) traffic on the existing route as well as on the three proposed optional improvements (A, B, and C). The results can be compared on the Project Data Table.

PROPOSED IMPROVEMENT

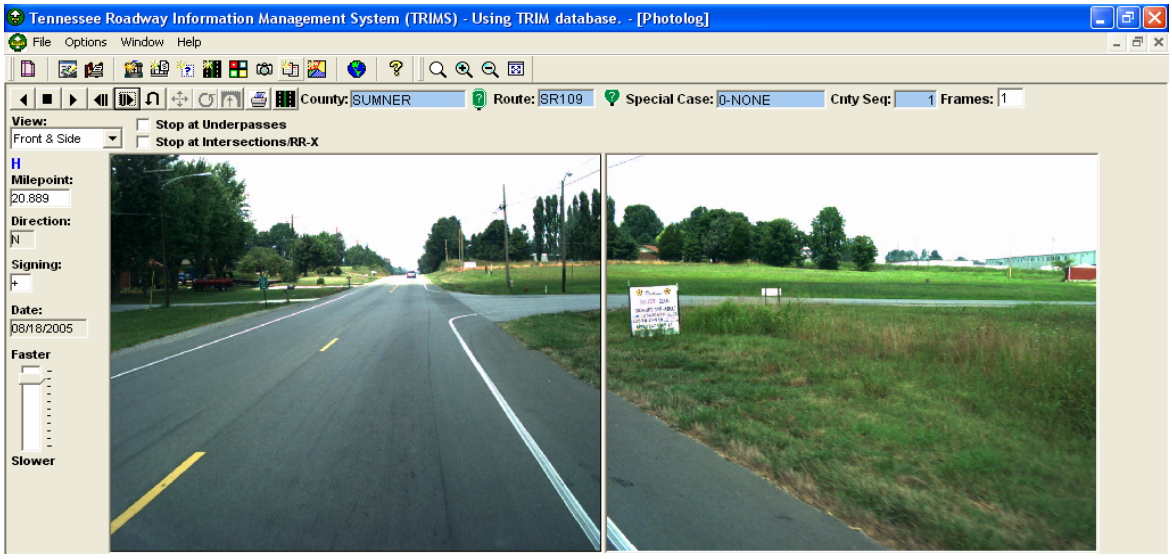
Description

This report will focus on corridor options to improve access from State Route 109 to Interstate 65. Option A begins at the proposed new location near State Route 76 connecting to State Route 52, then westward along existing State Route 52 to the Interstate 65 interchange, a total distance of approximately 10.08 miles.



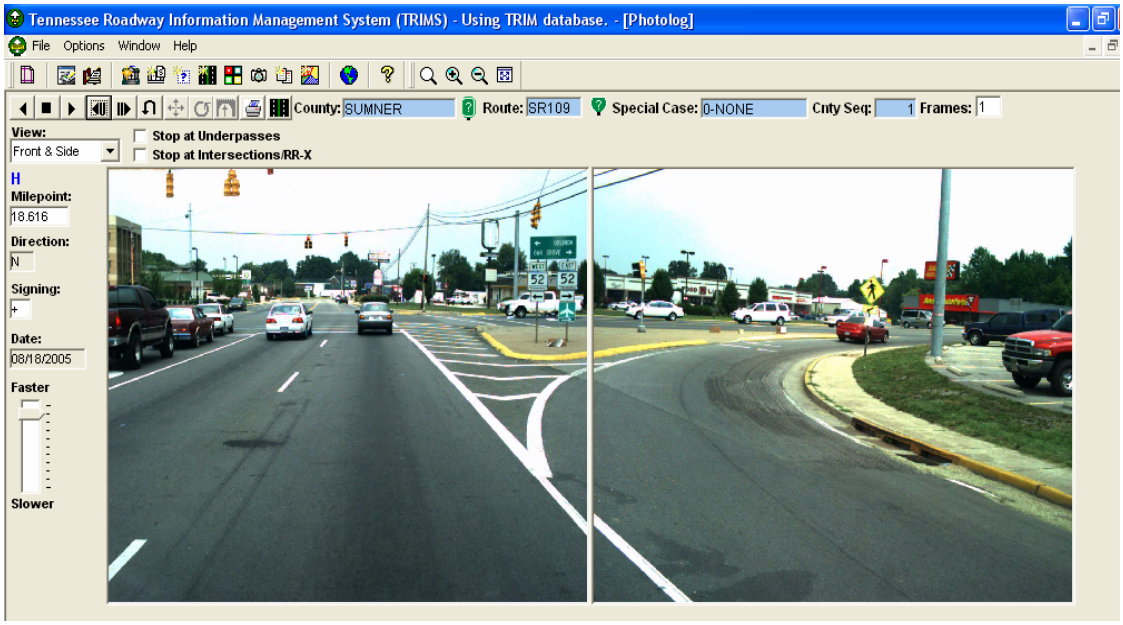
SR-109: Intersection of SR-109 & SR-76 heading north at LM 16.6

With the two-lane Kirby Road connector, the total distance for Option A is approximately 11.97 miles.



SR-109: Intersection of SR-109 & Kirby Road heading north at LM 20.88

Option B begins at the proposed new location near State Route 76 running north to State Route 52. From State Route 52, the proposed new State Route 109 will connect to the proposed new Interstate 65 interchange at State Route 109, a total distance of approximately 7.97 miles. With the two-lane Kirby Road connector, the total distance for Option B is approximately 8.84 miles.



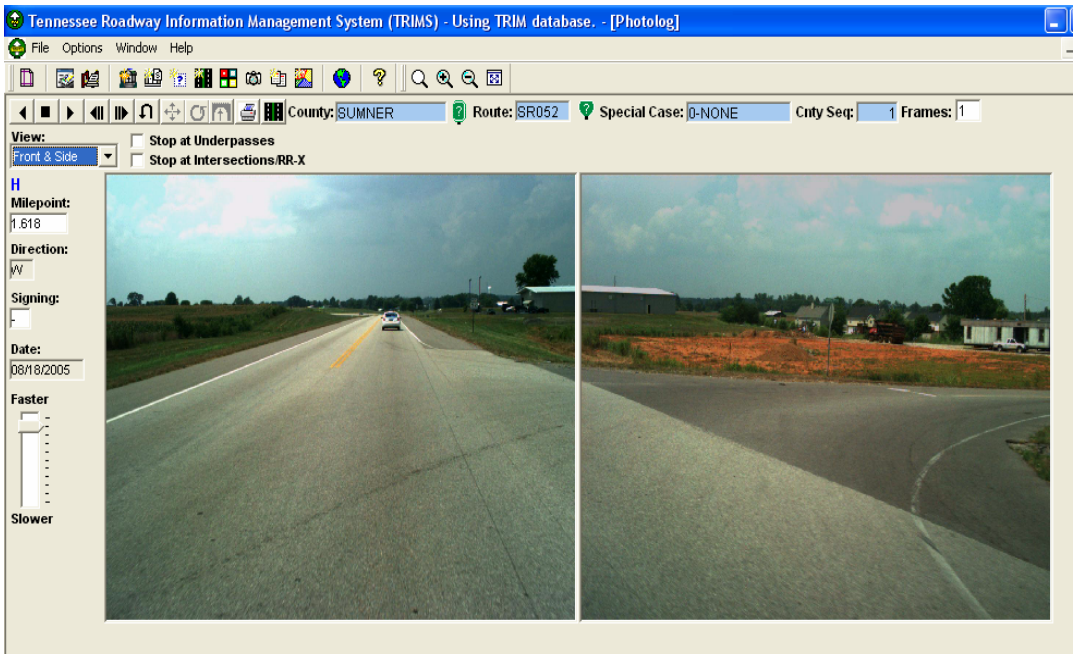
SR-109: Intersection of SR-109 & SR-52 heading north at LM 18.61

Option C extends from the proposed new location near State Route 76 to State Route 52. From State Route 52, the proposed route extends to State Route 109 and improves existing State Route 109 to tie into proposed new connector to the new Interstate 65 interchange a total distance of approximately 6.89 miles.

The project has been divided into 8 sections for planning and funding purposes. Three optional build improvements were analyzed for this report. The corridor location maps attached to this report depict the proposed sections for these three options.

Option A – Section 1 of this option proposes to relocate State Route 109 from near State Route 76 to State Route 52 and build a four lane divided highway. State Route 52 near New Deal-Potts Road (Section 2) west to I-65 and east to Market Street (SR-52 Connector) will be widened to a four lane divided highway.

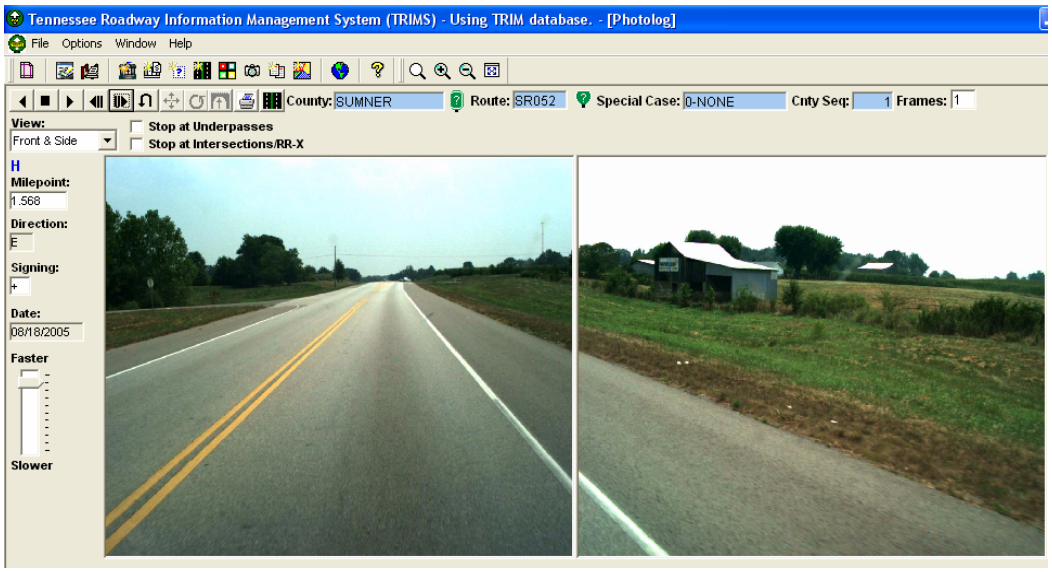
The interchange at State Route 52 under Option A will be modified and the cost of this modification is included in Section 2 of Option A. The proposed interchange configuration will be determined under future studies.



SR-52: Intersection of SR-52 and New Deal-Potts Rd. heading west at LM 1.61

Option A Kirby Road Connector comprise connecting a two-lane road from State Route 52 to the existing intersection of State Route 109 and Kirby Road.

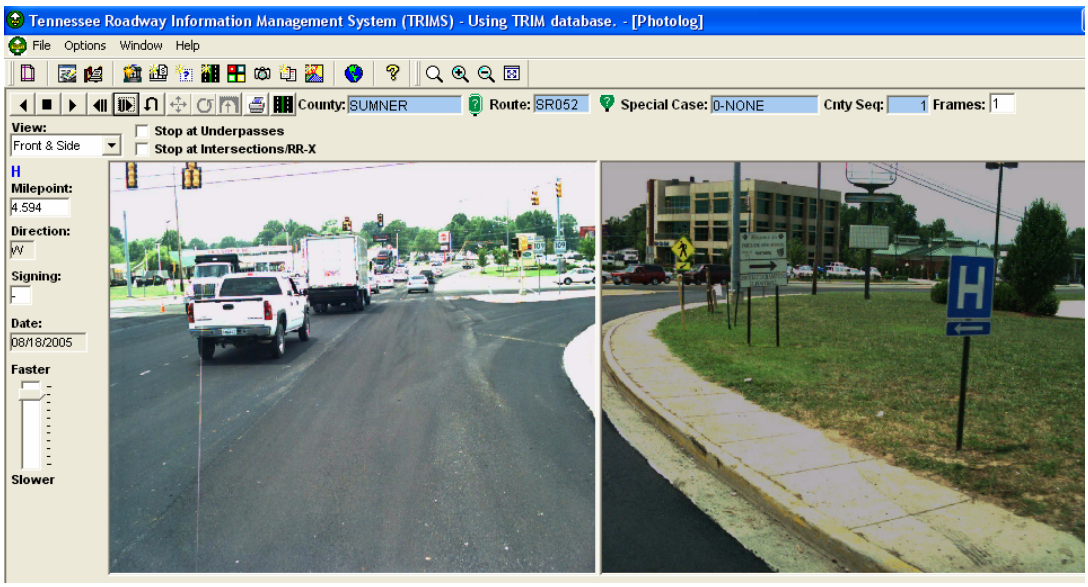
Option B – Section 1 of this option proposes to relocate State Route 109 from near State Route 76 to State Route 52 and build a four lane divided highway.



SR-52: Intersection of SR-52 and New Deal-Potts Rd. heading east at LM 1.56

Section 1 continues the proposed relocation of State Route 109 from State Route 52 to the Interstate 65 (Collins Park Interchange) and build a four lane divided highway. Option B Kirby Road Connector is a two-lane connecting road from the existing intersection of State Route 109 and Kirby Road.

Option C – Section 1 of this option proposes to relocate State Route 109 from near State Route 76 to State Route 52 and build a 4 lane divided highway.



SR-52: Intersection of SR-52 & SR-109 heading west at LM 4.59

Section 2 proposes to connect Kirby Road from State Route 109 to State Route 52 and Section 3 proposes to connect State Route 109 from Kirby Road to the I-65 (Collins Park Interchange) and build a four lane divided highway. The length of this option also minimizes environmental impacts, ROW requirements and construction costs.

The necessary right-of-way to build the project will vary depending on the median width, terrain, and land use. A no-build option was also analyzed for this report. The no-build option, as the name implies, denotes that only minor improvements (such as safety improvements and normal maintenance) would be made to the existing road and/or intersection areas.

ASSESSMENT OF OPTIONS

The Tennessee Department of Transportation (TDOT) has adopted seven guiding principles against which all transportation projects are to be evaluated. These guiding principles address concerns for system management, mobility, economic growth, safety, community, environmental stewardship, and fiscal responsibility. These guiding principles are discussed in the following paragraphs as they relate to the options for improving State Route 109 in Sumner County.

Guiding Principle 1: Preserve and Manage the Existing Transportation System

When construction was completed on February 15, 1929, State Route 109 provided a facility for regional mobility through Sumner County. That function has degraded in recent decades due to the lack of access control combined with increased commercial development along the route.

The widening of existing State Route 109 is consistent with TDOT's goal of preserving the existing transportation system, but would fail to service future traffic volumes, and fail to reduce truck traffic through the Central Business District of the City of Portland. The widening of existing State Route 109 through the city would necessitate acquisition of very expensive right-of-way in a developed commercial and residential area that would involve significant property and environmental impacts. Utility relocations would also be more costly than with the other considered options.

Options A, B, and C involve construction of a new location for State Route 109 that can help preserve the service life of existing State Route 109 by diverting regional traffic that does not have an origin or destination in Portland. The options will also divert truck traffic around the city instead of having to travel through it.

Guiding Principle 2: Move a Growing, Diverse, and Active Population

The options considered in this report will provide needed capacity to address Portland's and Tennessee's regional travel demands. Residential and commercial development and access along existing State Route 109 has made it less conducive to accommodating regional trip making, particularly to freight movement.

Industry is an important component of Portland's economy. Freight movement on existing State Route 109 is a concern as the route has become more congested in recent years. Options A, B, and C all have the potential for providing an alternative route for truck traffic.

Guiding Principle 3: Support the State's Economy

State Route 109 provides direct and indirect access to all of the major population centers in Sumner County. The population in Portland has increased approximately 20% since the 2000 census. The unemployment rate in Portland is 4.4%. The areas economic growth and jobs created by the 1,200 acre Collins Industrial Park located to the west side of Interstate 65 north of Portland have not only benefited the local economy, but the state's as well. The development of the proposed State Route 109 project will create better and safer access to the Collin's Industrial Park, which in turn will fuel future economic growth and development in the local and statewide economies.

This study recognizes the need to improve Portland's access to Interstate 65 to the north or west and Interstate 40 to the south. Options A, B, and C could provide a link to disperse north and south traffic around the city of Portland and the new Interstate 65 and State Route 109 interchange (separate project).

Guiding Principle 4: Maximize Safety and Security

Traffic crash rates on existing State Route 109 were calculated from crash data for the years 2002 through 2004. A total of 191 traffic crashes were reported during that period, of which 57 (30%) involved an injury. There were no fatalities during this time period. The statewide average crash rate for the existing rural two lane road is 1.71, while the crash rate for the proposed four lane divided road is .80 which is a noticeable improvement over existing conditions. The crash rate is calculated by dividing the number of crashes divided by a million vehicle miles traveled. The crash rate is negatively influenced by traffic congestion and lack of access control.

Guiding Principle 5: Build Partnerships for Livable Communities

TDOT staff has coordinated with local officials to identify their concerns and objectives. In keeping with the goals of TDOT's current Public Involvement Process, several meetings have been held with the local officials and two public meetings to coordinate the transportation needs envisioned by the citizens of the local community and those of TDOT. This public involvement

process will continue as mandated by the provisions of the National Environmental Policy Act (NEPA).

Guiding Principle 6: Promote Stewardship of the Environment

A detailed environmental study is needed to fully address the impacts of each considered option. It should be noted that items listed on the Preliminary Environmental Evaluation form are located within the identified corridors, but may not necessarily be impacted. A benefit of the proposed State Route 109 will be improved travel flow, and this in turn could positively impact air quality.

Guiding Principle 7: Promote Financial Responsibility

Preliminary construction cost estimates were prepared for each considered option upon typical per mile costs. Table 1 summarizes the construction cost estimates for all options.

Table 1

Comparison of Construction Cost Estimates

OPTION	NUMBER OF NEW LANES	CONSTRUCTION COST	LENGTH	COST PER MILE
No Build	n/a	$0	n/a	n/a
Option A	4	$61,279,000	10.08	$6,079,265
Option A w/Kirby Rd.	4 & 2	$67,012,000	11.97	$5,598,329
Option B	4	$37,248,500	7.97	$4,673,588
Option B w/Kirby Rd.	4 & 2	$40,184,830	8.84	$4,545,795
Option C	4	$36,874,690	6.89	$5,351,914

PRELIMINARY ENVIRONMENTAL ANALYSES

TDOT's Environmental Division has conducted a preliminary investigation into this project's possible environment impacts within the Area of Potential Effects (APE). The APE is the geographic area in which an undertaking may directly or indirectly impact the environment. A more comprehensive analysis of the impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA). This analysis will require the consideration of environmental values in the decision making processes by taking into account the environmental impacts of proposed actions and reasonable alternatives to those actions. Additional

environmental disciplines such as social, economic, farmland, displacements, and land use impacts will be evaluated in the NEPA document after a Conceptual Stage Relocation Plan is completed by TDOT's Right-of-Way Division.

Historic

TDOT historians searched TDOT records and conducted a search at the Tennessee State Historic Preservation Office (TN-SHPO). Much of the area was surveyed by TDOT in the early 1990s for the State Route 840 project and in 1999 for the State Route 109 improvement project. The following historic properties were identified from these surveys:

1. One National Register Listed Property—Currently there is only one property listed on the National Register of Historic Places within the general project area: The Rock Jolly property is located approximately 2000 feet west of I-65.
2. Three National Register Eligible Properties—the McGlothin House, Log Building and Outhouse, and Rock Rest properties have been identified as eligible for the National Register of Historic Places.
3. Additional Survey—Numerous properties were surveyed in the proposed project area for State Route 840 North and the State Route 109 projects, and while these properties were not identified as historic at the time they will have to be reassessed for National Register eligibility. It should be stressed that further survey and research could indicate additional National Register eligible properties.

Measures should be taken in the planning process to avoid the National Register properties and minimize the project in order to prevent adverse effects or potential 4(f) takes. If properties are identified later as being eligible for the National Register, they will also need to be avoided to prevent adverse effects or potential 4(f) takes.

Summary

As a result of public involvement and input, three options were prepared for this report. The proposed project area varies in length depending on the option selected. Option A, is approximately 10.08 miles without a Kirby Road connector, and 11.97 miles in length with a Kirby Road connector. Option B, is approximately 7.97 without a Kirby Road connector, and 8.84 miles in length with a Kirby Road connector. Option C, is approximately 6.89 miles in length. These options are based within selected corridors and will be further evaluated under future studies for horizontal and vertical alignment, right-of-way, utility adjustments, environmental mitigations and structures.

All three build options will improve sight distance and improve the deficient horizontal and vertical alignments throughout the route. The improved roadway will also enhance access to Interstate 65 to both commercial and industrial sites along the route. Other primary beneficial effects include: (1) improved local and regional accessibility; (2) improved safety and operating conditions along the project corridor; (3) increased traffic capacity; and (4) enhancement of future planned growth by local and/or regional land use planning agencies. The primary adverse effects of the three proposed build options include: (1) the loss of land for right-of-way; (2) the possible displacement of residences and businesses; and (3) temporary construction impacts (dust, siltation, equipment noise, etc.) during the construction period; (4) traffic noise.

As depicted on the Project Data Table, the design year LOS for both Options A, B and C range from A to C throughout the entire proposed route. The comparable LOS for the no-build option is deficient (E or F). In addition, the disadvantages of the no-build option include continued inadequate operating conditions inherent with increased traffic volumes and roadway deficiencies such as horizontal and vertical alignments that would not be corrected. Trucks from the Industrial Park destined for Interstate 65 southbound and Interstate 40 east bound will still have to navigate through the Central Business District of Portland. Some advantages of the no-build option include preserving the existing land use patterns and no disruption of the area due to construction. Also, mitigation measures to moderate environmental impacts would not be necessary.

Improvements of State Route 109 are needed to address the following needs:

1. Provide a north/south route to serve demand for regional accessibility to the interstate highway system and protect that provision in the future.
2. Allow additional economic growth in the City of Portland and Sumner County by providing improvement to the transportation system.
3. Reduce the density of traffic on existing State Route 109 in order to improve safety and mobility.
4. Provide an alternate route to reduce the amount of truck traffic on existing State Route 109, especially the section from the Collins Industrial Park through the City of Portland.

In conclusion, this report identified four options to address the purpose and need. Options A, B, and C meet the purpose and need, but the no build option does not. Therefore, the three viable options should be advanced as recommended solutions for further development under the NEPA planning process.

No Build

- Does not provide the needed capacity to address mobility concerns
- Does not address system deficiencies concerning safety

Option A or A w/Kirby Road Connector

- Increases system capacity
- Has the highest total construction cost: $61,279,000 or $67,012,000 with Kirby connector
- Longest option
- Increases access to developable property
- Has potential to reduce truck traffic through the City of Portland, if Kirby Road connector is built
- Does address system deficiencies concerning safety
- Partial access control along corridor; Kirby connector no access control
- Has a higher potential for environmental impacts than other options
- Reconstructs State Route 52, a route with a lower crash rate and it has been built to newer standards than existing State Route 109

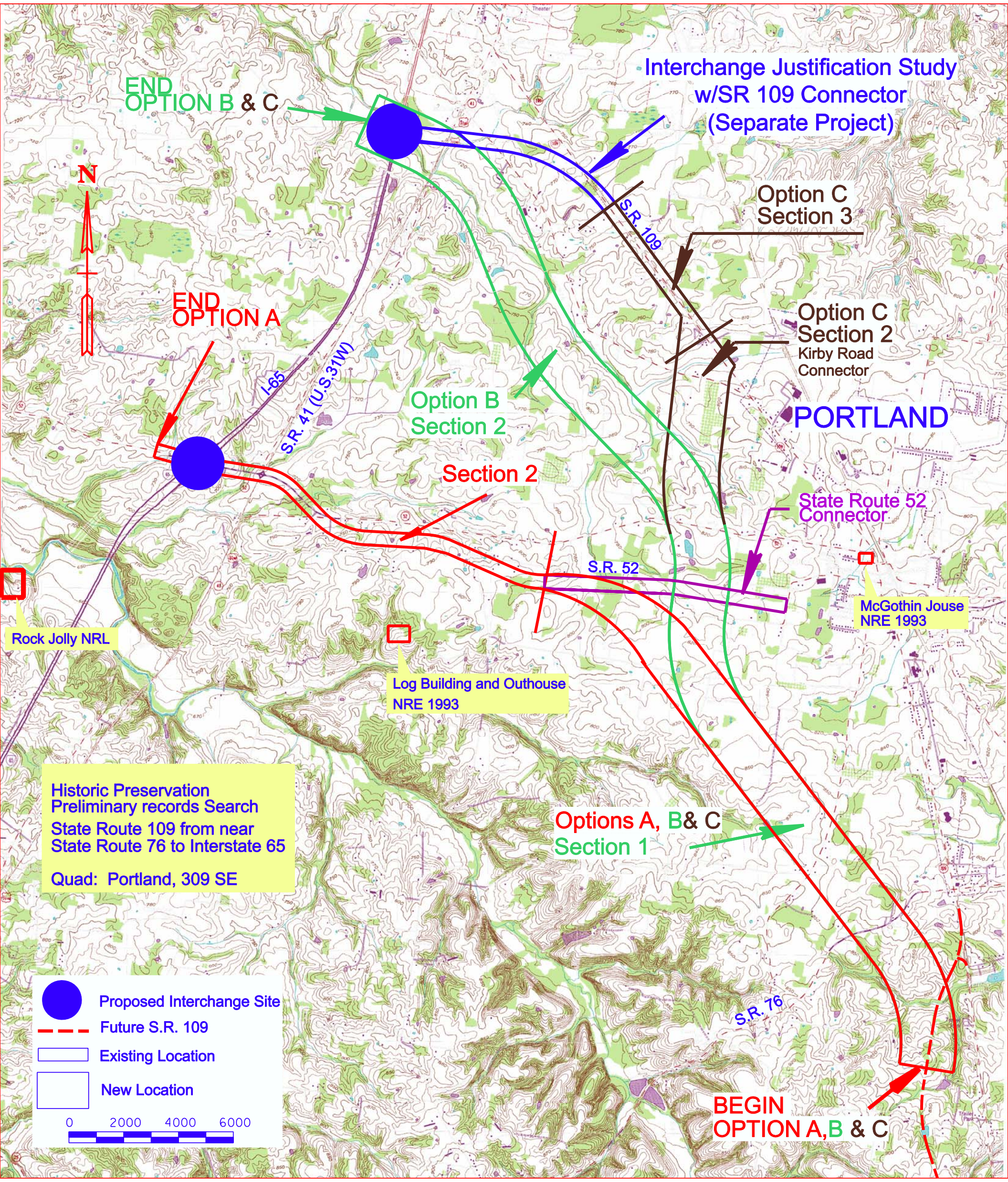
Option B or B w/Kirby Road Connector

- Increases system capacity
- Does address system deficiencies concerning safety
- Second highest total construction cost: $37,248,000 or $40,184,830 with Kirby connector
- Second longest option
- Partial access control along corridor; Kirby connector no access control
- Has a higher potential for environmental impacts.
- Has potential to reduce truck traffic through the City of Portland, if Kirby Road connector is built

Option C

- Increases system capacity
- Reduces truck traffic through the City of Portland
- Partial access control along corridor for improved regional and statewide mobility
- Increases access to developable property
- Has lowest total construction cost: $36,874,690
- Shortest option

- Has lowest potential for environmental impacts
- Provides better route connectivity with Interstate 65 and Interstate 40
- Helps to preserve and manage a portion of the existing State Route 109 by improving the section from Kirby Road to the proposed Interstate 65/State Route 109 interchange. Improvements along this section would be needed to meet future traffic demands.
- Does address system deficiencies concerning safety


END
OPTION B & C
Interchange Justification Study
w/SR 109 Connector
(Separate Project)
N
S.R. 109
Option C
Section 3
END
OPTION A
I-65
S.R. 41 (U.S.31W)
Option C
Section 2
Kirby Road
Connector
Option B
Section 2
PORTLAND
Section 2
State Route 52
Connector
S.R. 52
McGothin Jouse
NRE 1993
Rock Jolly NRL
Log Building and Outhouse
NRE 1993
Options A, B& C
Section 1
Historic Preservation
Preliminary records Search
State Route 109 from near
State Route 76 to Interstate 65
Quad: Portland, 309 SE
Proposed Interchange Site
Future S.R. 109
Existing Location
New Location
0
2000
4000
6000
S.R. 76
BEGIN
OPTION A,B & C

Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities or Economic, Social and Environmental categories (ESE), place the number of facilities in the blank opposite the item. Where more than one location option is to be considered, place its letter designation in the blank.

		Option A Section Numbers
1.)	Hazardous Material Site or Underground Storage Tanks.....	_____
2.)	Floodplains.....	_____
3.)	Historical, archaeological, cultural, or natural landmark, or cemeteries.....	2,SR-52 Connector, & Kirby _____
4.)	Airport.....	_____
5.)	Residential establishment.....	1,2,SR-52 Connector, & Kirby _____
6.)	Urban area, city, town, or community..... (Portland, Pop. 10,046)	1,2,SR-52 Connector, & Kirby _____
7.)	Commercial area, shopping center.....	1,2,SR-52 Connector, & Kirby
8.)	Institutional usages:	
	a. School or other educational institution.....	_____
	b. Hospital or other medical facility.....	_____
	c. Church or other religious institution.....	1,2,SR-52 Connector, & Kirby
	d. Public Building, e.g., fire station.....	_____
	e. Defense installation.....	_____
9.)	Agricultural land usage.....	1,2,SR-52 Connector, & Kirby
10.)	Forested land.....	_____
11.)	Industrial park, factory.....	SR-52 & Kirby Connector
12.)	Recreational usages:	
	a. Park or recreational area, State Natural Area.....	_____
	b. Wildlife refuge or wildlife management area.....	_____
13.)	Waterway:	
	a. Lake.....	_____
	b. Pond.....	1,2,SR-52 Connector, & Kirby
	c. River.....	_____
	d. Stream.....	1,2,SR-52 Connector, & Kirby
	e. Spring.....	_____
14.)	Railroad Crossings.....	_____
15.)	Location coordinated with local officials..... through 6	1,2,SR-52 Connector, & Kirby
16.)	Other.....	_____

Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities or Economic, Social and Environmental categories (ESE), place the number of facilities in the blank opposite the item. Where more than one location option is to be considered, place its letter designation in the blank.

		Option B Section Numbers
1.)	Hazardous Material Site or Underground Storage Tanks.....	_____
2.)	Floodplains.....	_____
3.)	Historical, archaeological, cultural, or natural landmark, or cemeteries.....	2 & Kirby Connector _____
4.)	Airport.....	_____
5.)	Residential establishment.....	1,2, & Kirby Connector _____
6.)	Urban area, city, town, or community..... (Portland, Pop. 10,046)	1,2, & Kirby Connector _____
7.)	Commercial area, shopping center.....	1,2, & Kirby Connector
8.)	Institutional usages:	
	a. School or other educational institution.....	_____
	b. Hospital or other medical facility.....	_____
	c. Church or other religious institution.....	1,2, & Kirby Connector
	d. Public Building, e.g., fire station.....	_____
	e. Defense installation.....	_____
9.)	Agricultural land usage.....	1,2, & Kirby Connector
10.)	Forested land.....	_____
11.)	Industrial park, factory.....	Kirby Connector
12.)	Recreational usages:	
	a. Park or recreational area, State Natural Area.....	_____
	b. Wildlife refuge or wildlife management area.....	_____
13.)	Waterway:	
	a. Lake.....	_____
	b. Pond.....	1,2, & Kirby Connector
	c. River.....	
	d. Stream.....	1,2, & Kirby Connector
	e. Spring.....	_____
14.)	Railroad Crossings.....	_____
15.)	Location coordinated with local officials.....	1,2, & Kirby Connector
16.)	Other.....	_____

Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities or Economic, Social and Environmental categories (ESE), place the number of facilities in the blank opposite the item. Where more than one location option is to be considered, place its letter designation in the blank.

		Option C Section Numbers
1.)	Hazardous Material Site or Underground Storage Tanks.....	
2.)	Floodplains.....	
3.)	Historical, archaeological, cultural, or natural landmark, or cemeteries.....	1 and 2
4.)	Airport.....	
5.)	Residential establishment.....	1 through 3
6.)	Urban area, city, town, or community..... (Portland, Pop. 10,046)	1 through 3
7.)	Commercial area, shopping center.....	2 and 3
8.)	Institutional usages:	
	a. School or other educational institution.....	
	b. Hospital or other medical facility.....	
	c. Church or other religious institution.....	1 through 3
	d. Public Building, e.g., fire station.....	
	e. Defense installation.....	
9.)	Agricultural land usage.....	1 through 3
10.)	Forested land.....	
11.)	Industrial park, factory.....	2 and 3
12.)	Recreational usages:	
	a. Park or recreational area, State Natural Area.....	
	b. Wildlife refuge or wildlife management area.....	
13.)	Waterway:	
	a. Lake.....	
	b. Pond.....	1 through 3
	c. River.....	
	d. Stream.....	1 through 3
	e. Spring.....	
14.)	Railroad Crossings.....	
15.)	Location coordinated with local officials.....	1 through 3
16.)	Other.....	