EXECUTIVE SUMMARY

The subject of this Transportation Planning Report (TPR) is the State Route (SR) 91 corridor located in Johnson County and Washington County, VA. This TPR was initiated by elected officials to establish long-term needs for future improvement options for this corridor and to assess the options for meeting these needs.

The purpose and need for improvement to the SR 91 corridor was developed based on the findings and analysis of the route's existing conditions, the travel demand projections for changing demographics in the area, coordination with other regional highway improvements, and the input from local and regional stakeholders.

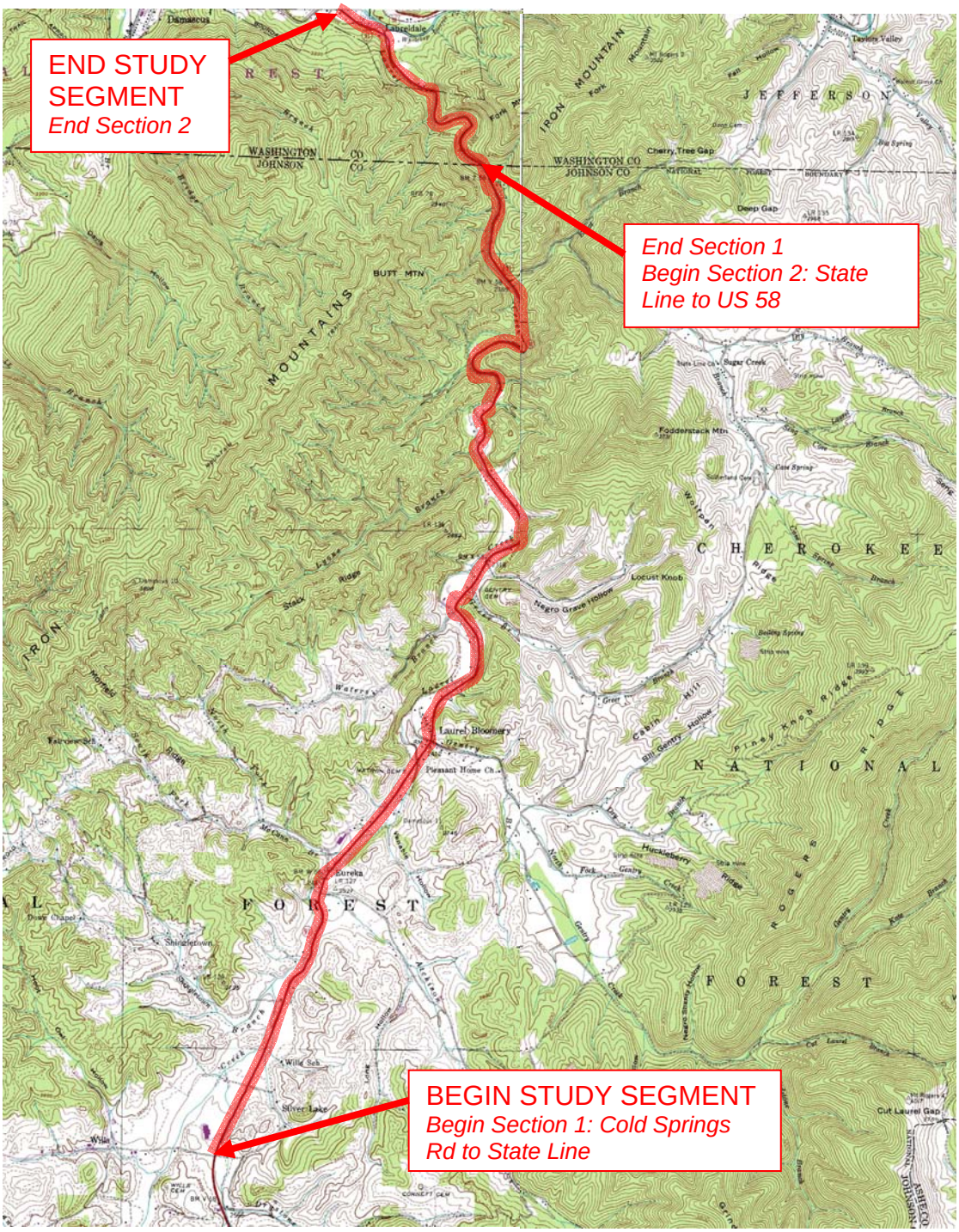
The primary purpose and need for the proposed improvement options is to provide a more efficient system linkage between Mountain City and I-81 to the north suitable for various user types including local traffic, tourists, non-motorized users, and commercial truck traffic. This segment will provide greater route continuity from the recently constructed SR 91 route north of Mountain City to improvements being made to US 58 in Virginia. The improved connection will also enhance the natural setting, including the Cherokee National Forest and Watauga and Holston Lakes, by providing improved access for recreational tourism, maintaining the environmental integrity, and promoting the scenic value of the corridor. Lastly, SR 91 will provide enhanced recreational opportunities by providing adequate accommodations for cyclists and pedestrians and making strategic connections to established regional destinations like the Virginia Creeper Trail.

To meet the purpose and need of an improved SR 91 corridor, two (2) options should be considered during the NEPA environmental analysis phase of this project.

- **Option A – No-Build:** The No-Build option assumes no modifications or improvements will be made over the planning horizon to add capacity. Analysis of projected traffic volumes supports this. Routine maintenance activities as well as scheduled resurfacing, signing, and possible safety projects may occur. This option, however, does not satisfy the proposed project's purpose and need to provide an improved system linkage between Mountain City and I-81.

- **Option B – Two-Lane Construction on New Alignment**: This TPR confirmed the conclusions of the 2003 Feasibility Study conducted by TDOT that only one alternate route to existing SR 91 is feasible. This alternate route is presented as Option B and describes a new alignment east of and parallel to the existing SR 91 corridor. Assumed construction consists of two (2) twelve (12) foot wide travel lanes and ten (10) foot wide shoulders with turn lanes and climbing lanes where needed. The length of this new corridor alignment is 8.7 ± miles. Because of the severe mountainous terrain crossed by Option B, significant structural and earthwork considerations exist in construction. Option B has an estimated cost of $178,622,000.

Consideration of improvement along the existing alignment was abandoned due to geometrical constraints; Laurel Creek to the west and mountainous terrain to the east prevents the possibility of widening travel lanes, constructing turn lanes, or adding shoulders on much of the route.



Vicinity Map.
SR 91, Johnson County, TN and Washington County, VA

TRANSPORTATION PLANNING REPORT

STATE ROUTE 91

From Cold Springs Road to Virginia State Line, Johnson County, Tennessee
From Tennessee State Line to US 58, Washington County, Virginia
PIN 114147.00

PREPARED BY
RPM TRANSPORTATION CONSULTANTS, LLC
For the
FIRST TENNESSEE RURAL PLANNING ORGANIZATION
in cooperation with
TENNESSEE DEPARTMENT OF TRANSPORTATION PROJECT PLANNING DIVISION

Approved by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING		11-28-11
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION		11-9-11
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION	Bill Hart	11/9/11

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1.0 PURPOSE OF STUDY

The subject of this Transportation Planning Report (TPR) is the State Route (SR) 91 corridor located in Johnson County, Tennessee and Washington County, Virginia. Johnson County officials have identified the segment of the SR 91 corridor north of Mountain City as being in need of prioritization for future improvement and asked the Tennessee Department of Transportation (TDOT) to study the corridor. The limits of the study are from Cold Springs Road, north of the City Limits of Mountain City, to US 58, southeast of the City Limits of Damascus, VA.

This study will analyze existing traffic conditions, roadway geometrics, and crash data to determine current improvement needs. An analysis of other transportation, land use, and development changes will be made to determine future transportation needs for the corridor. Improvement options will then be developed to best provide for the future transportation needs of the corridor. Also, an Early Environmental Screening (EES) will be made to determine the likely impacts to sensitive locations within the study area prior to the National Environmental Policy Act (NEPA) assessment if the TPR moves into the NEPA phase of development.

2.0 HISTORY AND BACKGROUND

For at least the past 25 years, Johnson County Officials have discussed the role and function of the SR 91 corridor and identified the route as a transportation priority. The background of this current study can be summarized into three different phases: Previous Improvements to SR 91, Related Projects in Virginia, and Current Planning Efforts. These three phases are discussed in detail in the following sections.

2.1 Previous Improvements to SR 91

Based on local planning going back at least to 1987, the SR 91 corridor through Mountain City had been identified as one that, while vital to the City, also had some transportation issues. At that time, SR 91 followed Church Street north from downtown. Church Street is an urban residential street which also accesses other neighborhood-related land uses like the high school. In support of local planning objectives and to provide a more modern highway facility, Church Street reverted back to a locally-maintained road and TDOT began construction of the new SR 91 alignment from SR 34 (US 421) to Cold Springs Road in 2004.

The new SR 91 was constructed roughly parallel to Cold Springs Road, north of Mountain City, on a new alignment. This segment of SR 91 is approximately 3.8 miles in length, and was constructed as a modern two-lane highway with turn lanes and climbing lanes where needed. Local stakeholders have indicated that this reconstructed segment of SR 91 has had the following impacts to the community:

- Improved the safety of Church Street,
- Lowered the cost of maintenance on the old SR 91 route (largely due to the diversion of truck traffic),
- Provided a more efficient route for traffic which meets current design standards, and
- Enhanced the residential and community context of the old SR 91 route.

2.2 Related Projects in Virginia

The Virginia Department of Transportation (VDOT) currently has one major project in various phases of development that has some relationship with the study segment of SR 91 north of Mountain City. An objective of VDOT is to provide a more efficient north-south highway through Washington County to improve the connection between Damascus with I-81 and Abingdon. To meet this objective, US 58 between Damascus and Abingdon is being improved.

Currently, US 58 is under construction from VA 677 south of Abingdon to VA 638. This is Phase 1 of a three-phase project to widen US 58 to a four-lane highway between Abingdon and Damascus. Phase 2 is the segment of US 58 from VA 638 to VA 708. Preliminary engineering and right-of-way acquisition are complete for Phase 2 (UPC # 16383 in the VDOT Six-Year Improvement Program). Phase 3 is the segment of US 58 from VA 708 to the western city limit of Damascus. Preliminary engineering is complete for Phase 3 and right-of-way acquisition is underway (UPC # 16382 in the VDOT Six-Year Improvement Program). No construction funding has been allocated for either Phase 2 or Phase 3 in the current Six-Year Improvement Program. Locations of the proposed and existing SR 58 construction locations are provided below in Figure 1.

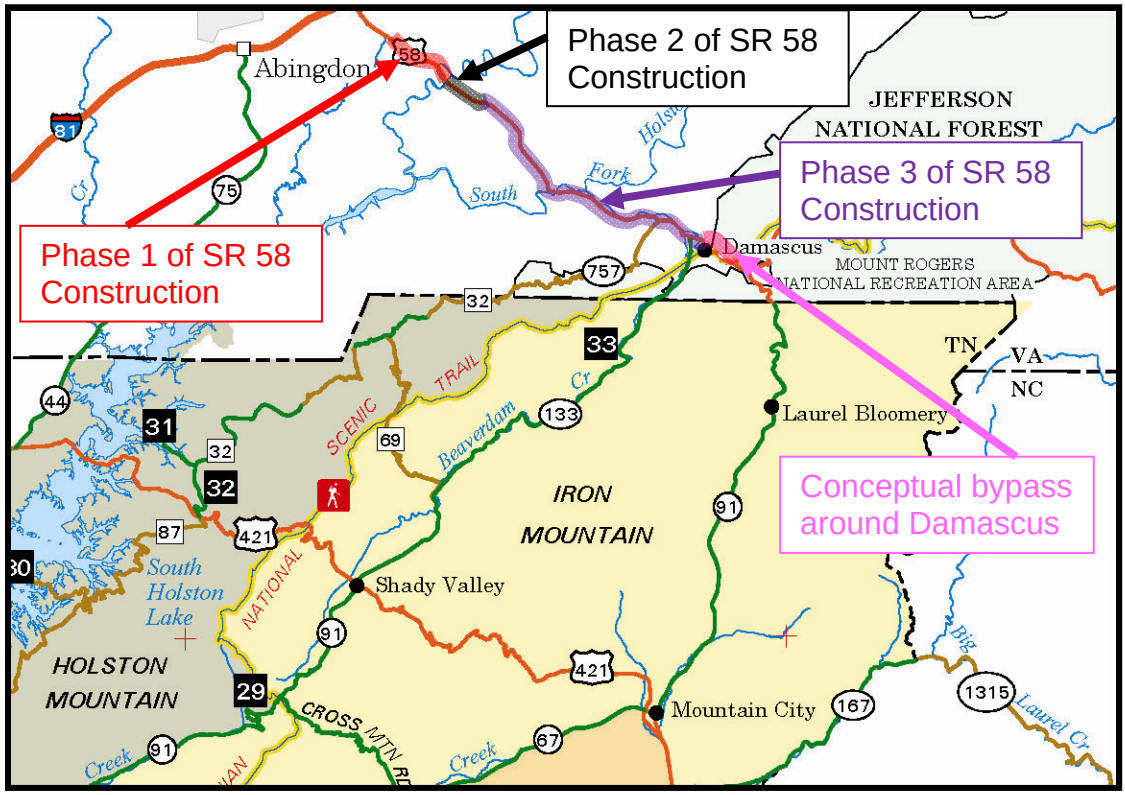


Figure 1. SR 58 Existing and Proposed Construction Locations.

The relationship between the US 58 improvements in Virginia and the study segment of SR 91 is that with improvement of SR 91, along with some additional roadway improvements or the provision of a new bypass around Damascus, an improved connection between Mountain City and I-81 would be available. Although discussed by VDOT in the past, VDOT currently has no plans to make local road improvements in Damascus or to provide a bypass route around Damascus to provide linkage in the event of the construction of an improved SR 91.

2.3 Current Planning Efforts

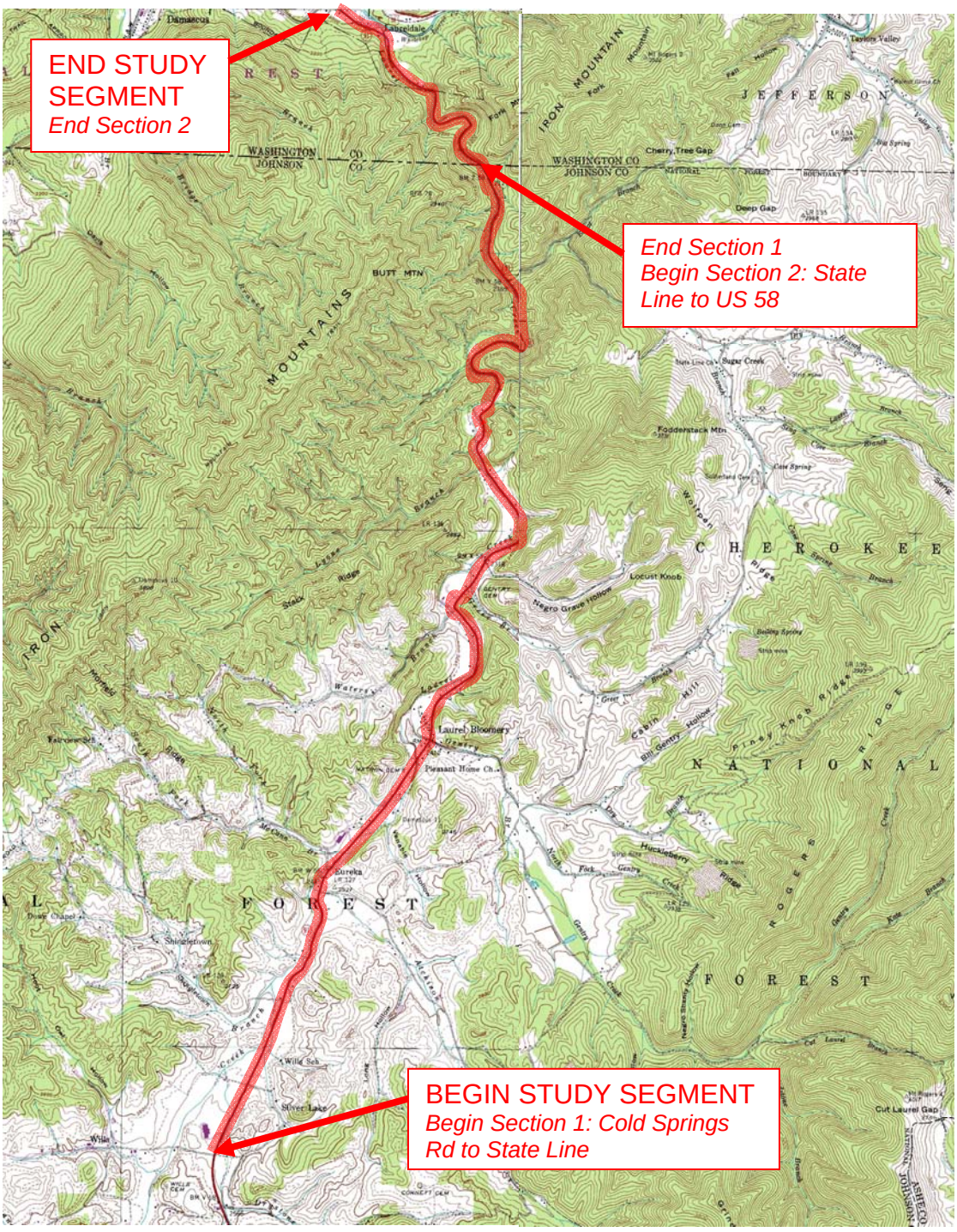
A feasibility study was completed by TDOT in 1987 for the now completed segment of SR 91 in Mountain City. Since the completion of that construction, Johnson County officials have included the improvement of the northern portion of SR 91 in local transportation plans.

The 2003 Johnson County Transportation Plan (the most recent) recommended the construction of a new alignment of SR 91, as a continuation of the new SR 91 route north of Mountain City, through Sugar Creek and reconnecting with the existing SR 91 prior to the Virginia State Line. This project is included as the sole short-term priority in the county plan.

In July 2003, in response to the Johnson County Transportation Plan and requests from local officials, TDOT performed a feasibility study for the SR 91 corridor from Cold Springs Road to the Virginia State Line. The study concluded that the only feasible improvement to the SR 91 corridor would be the construction of a new alignment parallel and east of the existing alignment. Improvement options along the existing SR 91 corridor were abandoned based on the confinements of the existing route by Laurel Creek to the west and mountainous terrain to the east. Also, consideration of a new alignment west of SR 91 was abandoned due to the topographic challenges of the Iron Mountain ridgeline which runs parallel to the existing corridor.

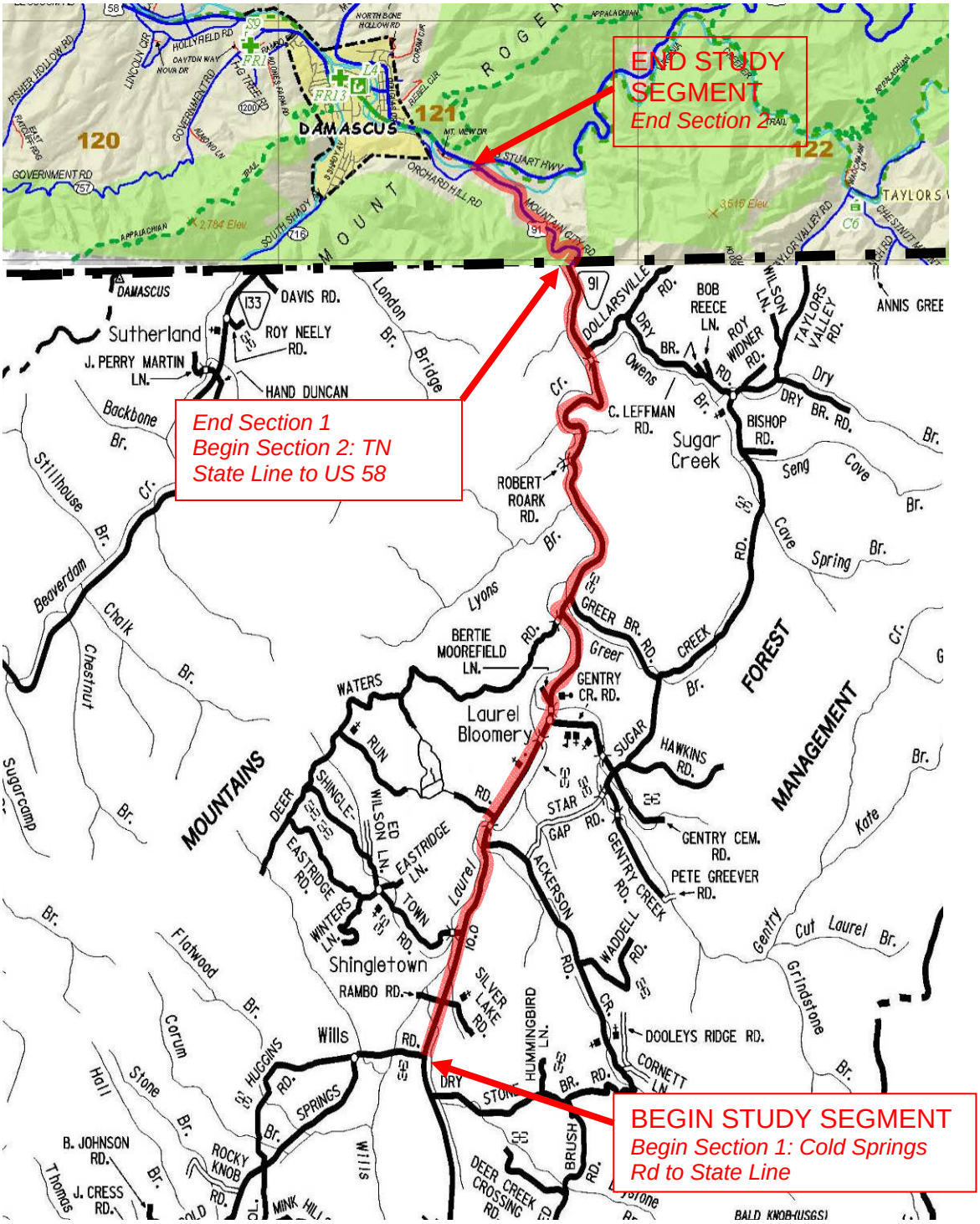
Currently, improvement of the SR 91 corridor north of Mountain City is identified as a priority project by the First Tennessee Rural Planning Organization.

A Vicinity Map for the study area is provided as Figure 2 and a Location Map for the study area is given as Figure 3.



Source: USGS. Not to Scale

Figure 2. Vicinity Map.
SR 91, Johnson County, TN and Washington County, VA



Source(s): TDOT County and City Maps, Washington County Road Map. Not to Scale

Figure 3. Location Map.
SR 91, Johnson County, TN and Washington County, VA

3.0 EXISTING CONDITIONS

3.1 Description of the Study Area

This study begins in an unincorporated area of Johnson County south of the community of Laurel Bloomery and ends in an unincorporated area of Washington County, VA, southeast of Damascus. Land uses along the 8.39 mile corridor include residential, institutional (private group camp), and farmland. A few commercial properties exist at Laurel Bloomery. Much of the route lies within the Cherokee National Forest and conservation land uses allow recreation but few development opportunities.

SR 91 provides the most efficient connection between Mountain City and areas north including Damascus, VA, Abingdon, VA, and I-81, the nearest interstate route. Because of the geometrics of the other roadways connecting Mountain City to the north, SR 91 is the quickest and most direct route and is therefore preferred for truck travel. In addition, being the primary northern access to the Cherokee National Forest and the areas surrounding Watauga Lake, SR 91 serves regional tourist traffic.

The Virginia Creeper (bicycle) Trail crosses SR 91 at the northern end of the study segment. The Virginia Creeper Trail is a nationally recognized recreational destination and has resulted in significant economic development for Damascus and the region. The Appalachian (hiking) Trail also passes through Damascus, bringing many hikers into this area. A conceptual bicycle path along an abandoned rail line on the west bank of Laurel Creek and connecting to the Virginia Creeper Trail has also been discussed.

A map of the recreational destinations surrounding the SR 91 corridor is shown in Figure 4.

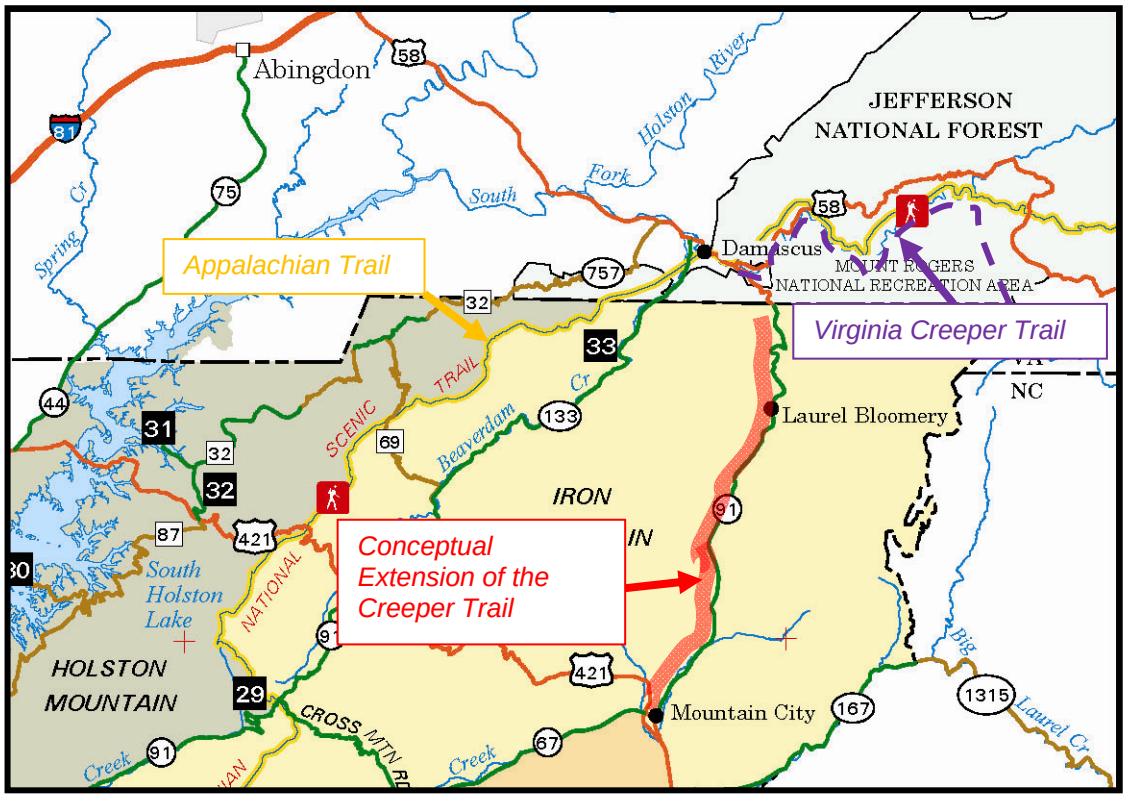


Figure 4. Recreational Destinations Location Map.

The US Census estimated Johnson County's 2009 population to be 18,019 residents. Unemployment rates for Johnson County in March 2011 were 13.2% as compared to the statewide unemployment rate of 9.5%[1]. The State Department of Labor and Workforce Development reported the 2009 average annual wage for Johnson County to be $30,198. Johnson County has the 71st highest wages of Tennessee's 95 counties. The statewide average annual wage for 2009 was $40,242[2]. The top industries (by percentage of all employment) for Johnson County are presented in Table 1.

Table 1. Leading Employment Industries, Johnson County, TN

Industry	Johnson County, TN	Tennessee
Retail Trade	19%	15%
Construction	11%	9%
Leisure and Hospitality	8%	9%
Professional and Technical Services	7%	10%
Education and Health Services	7%	10%

(Source: Quarterly Census of Employment and Wages. Tennessee Dept. of Labor and Workforce Development)

[1] Labor Force Estimates. Tennessee Dept. of Labor and Workforce Development, Employment Security Division.
[2] Quarterly Census of Employment and Wages. Tennessee Dept. of Labor and Workforce Development. Annual Average 2009.

3.2 Crash History

SR 91 was divided into two segments for crash experience analysis: Section 1 (Cold Springs Road to the Virginia State Line) and Section 2 (Virginia State Line to US 58). The summarized results are given in Table 2.

As shown in Table 2, most of the study route (within Tennessee) has a crash history that is equal to the Tennessee statewide average for rural two (2) lane highways. North of the State Line, the actual crash rate is slightly higher than VDOT's statewide average rate. Many (52%) of the crashes along SR 91 were road departure crashes. Crash severity along the route is typical (65% of crashes resulted only in property damage), though one fatal crash was reported from 2006 - 2009.

Table 2. Study Crash Experience Summary, 2006 - 2009

Location	Length (mi)	Number of Crashes	Actual Crash Rate (number of crashes per million vehicle miles)	Statewide Average Crash Rate (number of crashes per million vehicle miles)
Section 1: Cold Springs Road to VA State Line	6.83	54	1.661 cr/mvm	1.657 cr/mvm
Section 2: VA State Line to US 58	1.62	11	2.05 cr/mvm[3]	1.61 cr/mvm[3]

3.3 Geometrics

The study segment of SR 91 is a typical rural road having eleven (11) foot travel lanes and both paved and unpaved shoulders that vary in width throughout the study segment from 0-2 feet. The route is generally signed with a posted speed limit of 45 mph (55 mph in Virginia), but the alignment makes these speeds impractical over some segments of the route. SR 91 is designated by TDOT as a rural major collector.

The major geometric deficiencies of the route are created by the severe topography which SR 91 transverses. Much of the route follows Laurel Creek, placing a large portion of the existing route within a flood plain. In several locations, the banks of Laurel Creek are adjacent to the road on one side, and the toe of the slope of a mountain is adjacent to the road on the other. This width limitation prevents the possibility of widening travel lanes, constructing turn lanes, or adding shoulders on much of the route. Additionally, the original SR 91 construction which followed the creek and adjacent mountain topography required that the road contain numerous horizontal curves, many with short radii. The vertical curvature of the route, while present, is not considered to be a geometric deficiency. The geometric conditions of SR 91 are presented in Table 3.

[3] Crash analyses provided by VDOT.

Table 3. Geometrics Summary of State Route 91

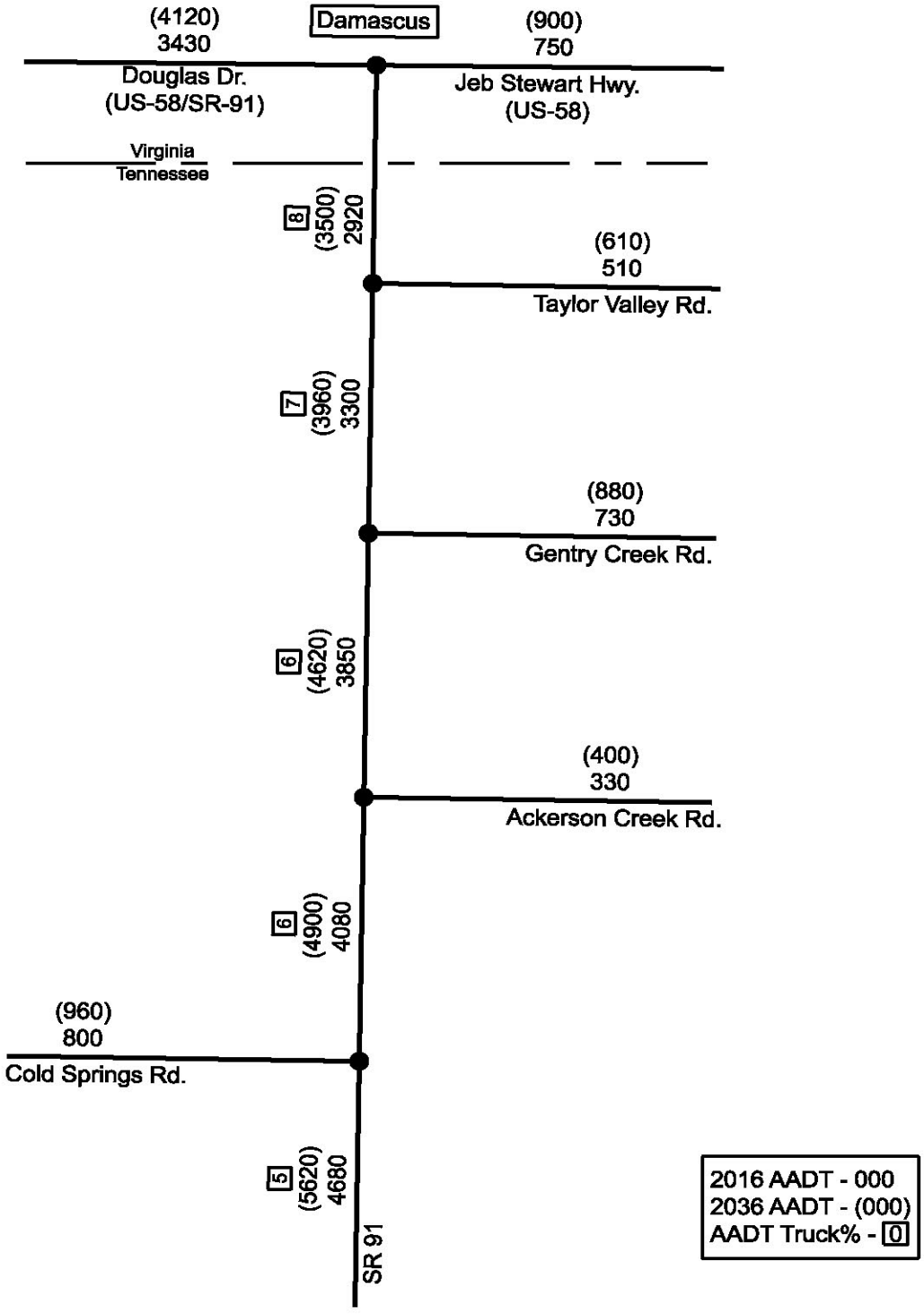
Geometric Data	Segment of SR 91	
	Section 1 (Tennessee): Cold Springs Road to State Line	Section 2 (Virginia): State Line to US 58
Functional Classification	Rural Major Collector	Rural Major Collector
Length	6.81 miles from Cold Springs Road (L.M. 7.52) to State Line (L.M. 14.33)	1.62 miles from State Line to US 58
Average Right-of-Way Width	Variable, 66 feet typical	Variable
Average No. Travel Lanes	2 (1 each direction)	2 (1 each direction)
Average Lane Width	11 feet	11 feet
Average Shoulder Width	2 feet (paved and gravel)	None
Median Type	None	None
Average Median Width	N/A	N/A
Bicycle Facilities	None	None
Average Sidewalk Width	None	None
Topography	Mountainous	Mountainous
Major Intersections	None	One way stop control on US 58 at the intersection of SR 91 and US 58
Drainage	Open ditch	Open ditch

3.4 Level of Service Analyses

SR 91 currently carries approximately 3,850 vehicles per day (vpd) at the southern end of the study area and 2,760 vpd near the Virginia State Line. The projected base year (2016) annual average daily traffic (AADT) along SR 91 ranges from 4,680 to 2,920 vpd. The projected future year (2036) AADT ranges from 5,620 to 3,500 vpd. The projected traffic volumes for the study area are given in Figure 5.

The base year and design year operating characteristics for the study segments were analyzed as part of the study. A “Level of Service” (LOS) index was used to gauge the operational performance at each roadway segment. The 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. Table 4 shows the traffic flow conditions and approximate driver comfort level at each level of service.



Source: TDOT and VDOT. Not to Scale

Figure 5. Projected Average Annual Daily Traffic (AADT)

Table 4. Level of Service Operational Criteria

Level of Service (LOS)	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver with the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonable 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.
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 exceeds the capacity or ability of the highway to accommodate that number of vehicles. There is little room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Source: *Highway Capacity Manual,* TRB 2010

As defined by the *Highway Capacity Manual*, level of service analyses for two lane highways are defined by three (3) different highway classifications. Class I Highways – Highways where motorists expect to travel at relatively high speeds, such as major intercity routes, primary connectors of major traffic generators, daily commuter routes, or major links in state or national highway networks; Class II Highways - Highways where motorists do not necessarily expect to travel at high speeds, such as access routes to Class I facilities, scenic or recreational routes, or routes passing through rugged terrain; Class III Highways – Highways serving moderately developed areas, such as portions of a Class I or Class II highway that pass through small towns or developed recreational areas. Based on these descriptions the SR 91 corridor was analyzed as a Class II Highway.

The base year and future year projected LOS is given in Table 5.

Table 5. Current and Projected Segment Level of Service (Existing Alignment)

SR 91 Segment of Analysis	Analysis Type	Level Of Service		
		2011 Current Year Peak Hour	2016 Base Year Peak Hour	2036 Future Year Peak Hour
All	Class II Two-Lane Segment	C	C	C
Note: All analyses made using a Class II, two (2) lane cross section.				

As shown in Table 5, the existing study segment is expected to operate at a LOS C through the 2036 design year. Also, the peak hour volume-to-capacity ratio for the existing segment is expected to rise from 0.20 (2011) to 0.27 (2036).

3.5 Major Structures

SR 91 follows Laurel Creek and has eight (8) structures crossing the creek or its tributaries. All of these structures have sufficient width for only two (2) lanes of traffic. Section 1 has six (6) total structures with four (4) rated in good condition and two (2) rated as functionally obsolete. Section 2 has two (2) structures with one (1) rated in good condition and one (1) rated as functionally obsolete.

3.6 Multi-Modal Facilities

This segment of SR 91 is not part of any designated bike route. However, recreational use of SR 91 (by car) is common given its location within the Cherokee National Forest and its proximity to the Virginia Creeper Trail and the Appalachian Trail. SR 91 has no sidewalk and no shoulders with which to accommodate non-motorized road users. The Highway Capacity Manual-based analysis of bicycle level of service on SR 91 is given in Table 6. Pedestrian level of service for a two-lane highway is not supported by the current Highway Capacity Manual.

Table 6. Current and Projected Bicycle Level of Service (Existing Alignment)

SR 91 Segment of Analysis	Analysis Type	Bicycle Level Of Service		
		2011 Current Year Peak Hour	2016 Base Year Peak Hour	2036 Future Year Peak Hour
All	Bicycle LOS	E	F	F
Analyses made using existing two (2) lane cross-section.				

Construction of an off-road, multi-use path is a plan that is advocated by the Johnson County Trail Association. The plan involves constructing a trail that would connect the Virginia Creeper Trail to Mountain City and ultimately south to Watauga Lake. Constructing this connector trail on an existing, abandoned rail bed is proposed; a

portion of the proposed trail alignment parallels the study segment along the west side of Laurel Creek. This proposed off-road, multi-use path is shown in Figure 4.

No fixed route transit service or other modal considerations exist or are planned in Johnson County.

4.0 FIELD REVIEW INFORMATION

A field review with TDOT, local, and regional stakeholders was held in Mountain City on March 31, 2011 to give an overview of the current study and to discuss the purpose and need for this study. The general themes of the meeting were as follows:

- The local viewpoint is that a new alignment of the SR 91 corridor would not just improve in-state economic development but regional economic development as well, including Virginia and North Carolina. According to local stakeholders, the concept of a regional economy (not limited within a single state's borders) is being cultivated within the region, and transportation infrastructure is a critical piece of this model.
- A significant percentage of the land area of Johnson County is designated as part of the Cherokee National Forest. Much of the existing SR 91 study area is within the national forest. For this reason, access to adjacent lands for development is not a primary objective of corridor improvement.
- According to stakeholders, improving the access from Mountain City to I-81 is a special need for economic and business development within Mountain City and the surrounding area. Without a more direct connection to the north, stakeholders believe that transportation and access will remain a major challenge to increased business development within the area.
- Watauga and Holston Lakes are tourist destinations within the vicinity of Mountain City. Access to these lakes from the north (including I-81) is provided by SR 91.
- Roadway improvements should complement emerging economic development initiatives of Johnson County (for example, as a center for outdoor recreation activity).
- Improvement along the existing alignment would be difficult due to the proximity of Laurel Creek as well as the extreme topography adjacent to the creek.
- Given the need for a more modern and efficient connection to I-81 and the limitations of the existing SR 91, it is not expected that spot improvements to the existing route will effectively meet an established purpose and need for this study.

The field review minutes are provided in the Appendix.

5.0 PURPOSE AND NEED

The purpose and need for improvement to the SR 91 corridor was developed based on the findings and analysis of the route's existing conditions, the travel demand projections for changing demographics in the area, coordination with other regional highway improvements, and the input from local and regional stakeholders. Below is a list of needs which were considered when developing the purpose and need for improvements:

1. Safety – The majority of the study route within Tennessee has a crash history that is equal to the Tennessee statewide average for rural two (2) lane highways. North of the State Line, the actual crash rate is slightly higher than VDOT's statewide average rate. No specific locations exhibiting high numbers of crashes or notable crash patterns were found.
2. System Linkage – SR 91 is the primary and most direct connection between Mountain City and Damascus, Abingdon, and I-81 to the north. Other connections to I-81 exist but are not ideal due to the area's mountainous terrain.
3. Capacity – As shown in Table 5, the existing study segment's capacity is adequate and is expected to operate at a LOS of C through the projected design year 2036.
4. Transportation Demand – Historic traffic growth within the SR 91 corridor has been modest and future traffic growth is not expected to exceed the roadway capacity through the 2036 planning horizon. There are no specific commercial, residential, or recreational developments that appear certain enough to warrant significant additional roadway capacity.
5. Legislation – The County Seat Connector Initiative was developed in response to TCA 54-5-102 which states that "It is the intent of the general assembly that all county seats should be connected by a four-lane highway to the nearest interstate highway by the best route available." Mountain City is one of the 21 county seats for which no phase of this initiative is funded or underway. Connecting Mountain City to I-81 with an improved SR 91 alignment would fulfill the ideals of this Program (local stakeholder input has indicated that a Johnson County connector need not consist of a four-lane highway), but is also dependant on roadway projects in Virginia. Elected officials re-initiated this study of the SR 91 corridor.
6. Social Demands or Economical Development – According to the local stakeholders, improving the access from Mountain City to I-81 is a special need for economic and business development within Mountain City. Without a more direct connection to the north, stakeholders believe that transportation and access will remain a major challenge to increased business development within Mountain City and the surrounding areas.
7. Modal Interrelationships – The proposed corridor will be conducive to cyclists and will make strategic connections to established regional destinations like the Virginia Creeper Trail. Also, diverting truck traffic to the proposed corridor will present cyclists with the option of using the existing SR 91 corridor as an alternative and scenic route.
8. Roadway Deficiencies – The existing SR 91 corridor consists of substandard geometrics such as horizontal curvature and limited lane and shoulder width. The proximity of the corridor to Laurel Creek to the west and mountainous terrain to the east present significant obstacles to options for improvement along the existing corridor. The proposed new alignment will create a more efficient and direct connection from Mountain City to I-81 to the north while maintaining the scenic and environmental integrity of the existing corridor.

As a result of these analyses, the primary purpose and need for the proposed improvement options is to provide a more efficient system linkage between Mountain City and I-81 suitable for various user types including local traffic, tourists, non-motorized users, and commercial truck traffic. This segment will provide greater route continuity from the recently constructed SR 91 route north of Mountain City to improvements being

made to US 58 in Virginia. The improved connection will also enhance the natural setting, including the Cherokee National Forest and Watauga and Holston Lakes, by providing improved access for recreational tourism, maintaining the environmental integrity, and promoting the scenic value of the corridor. Lastly, SR 91 will provide enhanced recreational opportunities by providing adequate accommodations for cyclists and pedestrians and making strategic connections to established regional destinations like the Virginia Creeper Trail.

6.0 OPTIONS FOR IMPROVEMENT

To meet the purpose and need of an improved SR 91 corridor, two (2) options should be considered during the National Environmental Policy Act (NEPA) environmental analysis phase of this project.

6.1 Option A – No-Build

With no improvements to this segment of SR 91, the operational level of service will remain at an acceptable LOS C through the projected year 2036. Traffic volumes will remain well below the capacity of the highway. The lack of appreciable amounts of developable land outside of the Cherokee National Forest will not place any significant new demands for traffic capacity or access on SR 91 for the foreseeable future. With few expected changes in traffic volumes or redevelopment activities along the corridor, crash rates would reasonably be expected to remain at their current levels, approximately equivalent to the statewide average rate.

However, despite a lack of significant deficiencies in traffic capacity or safety, Option A would preclude several aspects of the established purpose and need of corridor improvement. First, under the no-build option, the need for an efficient regional highway connection from Mountain City to the north would remain unmet. Second, the full benefit of recent improvements to SR 91 in Mountain City and US 58 in Washington County, VA would remain unrealized. Lastly, the route in its current condition would remain an unsuitable accommodation for non-motorized users.

6.2 Option B – Two (2) Lane Construction on New Alignment

Option B describes the construction of a new roadway east of the existing SR 91. The new alignment will follow the existing SR 91 corridor for approximately 1.5 miles north of Cold Springs Road before veering to the northeast just south of the intersection of SR 91 and Ackerson Creek Road. The proposed alignment will traverse the mountainous terrain east of the existing SR 91 alignment following Sugar Creek Road. Constructing a new alignment is expected to lessen impacts along the banks of Laurel Creek and avoid significant disruption to the steep slopes adjacent to the existing roadway. However, northern portions of the Option B corridor will necessarily encounter very significant topography itself and will require commensurate levels of earthwork. The new roadway will have two (2) twelve (12) foot wide lanes with ten (10) foot wide shoulders. Turn lanes and climbing lanes are likely to be required to meet the need for a higher-speed corridor than currently exists. The length of this new roadway would be 8.7 ± miles.

As shown in Table 7, this new alignment will provide a LOS C through the 2036 design year. As shown in Table 8, the bicycle level of service will improve through the design year 2036 to a bicycle LOS of A, primarily due to the addition of shoulders in Option B.

Table 7. Base and Projected Proposed Option B Segment Level of Service (Proposed Alignment)

Proposed SR 91 Segment of Analysis (Option B)	Analysis Type	Non-Motorized Level Of Service	
		2016 Base Year Peak Hour	2036 Future Year Peak Hour
All	Class II Two-Lane Segment	C	C
Note: All analyses made using a Class II, two (2) lane cross section.			

Table 8. Base and Projected Proposed Option B Bicycle Level of Service (Proposed Alignment)

SR 91 Segment of Analysis	Analysis Type	Non-Motorized Level Of Service	
		2016 Base Year Peak Hour	2036 Future Year Peak Hour
All	Bicycle LOS	A	A
Analyses made using proposed two (2) lane cross-section.			

Construction of a new bridge would be required as part of Option B. Depending on the specific alignment chosen, this bridge would be approximately 1,500 feet in length. Located just south of the Virginia State Line, the bridge would span the valley associated with both Elliot Branch Creek and Owens Branch Creek on the western face of Iron Mountain.

In developing the cost of Option B, it has also been estimated that approximately 2,300 feet of tunnel construction would be required through the western face of Fork Mountain. From the south, the planned route would enter the mountain at an elevation of approximately 2,600 feet and at a location approximately 1,000 feet north of the State Line. The route would exit the tunnel at approximately the same elevation, before beginning its decent down the north face of Fork Mountain towards US 58. Tunnel construction at this location would preclude the construction associated with ascending and descending approximately 400 feet of elevation in mountainous terrain along the assumed alignment.

The total estimated cost of Option B is $178,915,000 including $3,707,000 for right-of-way acquisition, $541,000 for utility relocation, $153,707,000 for construction, and $20,960,000 for preliminary engineering. These costs are further broken into study sections in Table 9.

Table 9. Costs for Option B by Study Section

Cost Type	Section 1: Cold Springs Road to State Line	Section 2: State Line to US 58	Total, Option B Both Sections
ROW Acquisition	$3,608,000	$99,000	$3,707,000
Utility Relocation	$529,000	$12,000	$541,000
Construction	$65,841,000	$87,866,000	$153,707,000
Preliminary Engineering	$8,979,000	$11,981,000	$20,960,000
Total, Option B	$78,957,000	$99,958,000	$178,915,000

6.3 Other Improvement Considerations

In determining the alternatives for the improvement of the SR 91 corridor, several other alternatives were considered in addition to Options A and B as presented.

Spot Improvements/Improvement Along Existing Alignment – This alternative was removed from consideration based on stakeholder input, geometric constraints, and the dispersion of crashes throughout the route not clearly identifying any potential critical safety locations. Comprehensive improvement along the existing alignment to meet design objectives is deemed unfeasible due to the resulting impacts to Laurel Creek, the lower slopes of Iron Mountain, and residential properties.

Western Alignment – An evaluation of a corridor west of the existing SR 91 was made. This evaluation resulted in the dismissal of further consideration of a western alignment due to topography. A western alignment would require extreme earthwork cuts and fills throughout the entirety of the route to enable vehicles to traverse the eastern slopes of the Iron Mountain range. A western alignment is therefore deemed unfeasible.

Eastern Alignment(s) – Several other corridor possibilities were considered to the east of Option B. Once again, topographic conditions precluded further evaluation of these corridors. In short, this TPR confirmed the conclusions of the 2003 Feasibility Study conducted by TDOT that only one alternate route to existing SR 91 is feasible; and, while feasible, significant construction challenges for this option exist.

6.4 Disposition of Existing Route

Option A will not have an effect on the existing state route system. However, if Option B was implemented it would displace a portion of the existing SR 91 alignment to a new location. No determination has been made with regard to the disposition of the state route system. Any modification to the designation of the state route system will be decided during the NEPA process.

As a function of Option B, the by-passed segment of SR 91 would likely be removed from the State Highway System and revert to the local government for maintenance.

6.5 Preliminary Environmental and Cultural Considerations

The potential environmental impacts of this study have been investigated and the presence of common environmental items has been summarized in the "Preliminary Environmental Evaluation" form. A comprehensive analysis of the impacts will be completed in a later phase of the study in accordance with the National Environmental Policy Act (NEPA).

The existing SR 91 alignment is predominately located within the 100 year flood zone. Research of the Federal Emergency Management Agency's (FEMA) published flood maps does not show any encroachment on the 100 year flood zone by Option B. The flood zone maps for this area are provided in the Appendix.

Option B will transect the Cherokee National Forest property along its alignment. These impacts will require confirmation from the appropriate coordinating agencies as well as TDOT's coordination with them. A map of identified national forest areas is provided in the Appendix.

To determine the presence of environmentally sensitive features along the proposed corridor improvement options, an Early Environmental Screening (EES) was performed by TDOT for Options A and B. The EES found that concentrations of linguistically isolated and low-income populations exist along Options A and B.

For both Options A and B, the analysis found substantial impacts to TDEC Conservation Sites and Scenic Waterways, large wetland areas, wildlife management areas, and TWRA lakes and other public lands, moderate impacts to National Register Sites, terrestrial species, and pyritic rock, and low impact to cemetery sites and cemetery properties.

Terrestrial species found within the study area are:

- Symplocarpus foetidus
- Galium palustre
- Oenothera parviflora
- Corvus corax
- Minuartia godfreyi
- Dryopteris cristata
- Hexastylis virginica
- Cardamine rotundifolia
- Dryopteris cristata
- Cymophyllus fraserianus
- Hydrophyllum virginianum
- Scutellaria saxatilis

The EES reports are provided in the Appendix.

Preliminary Environmental Evaluation

If preliminary field reviews indicate the presence of any of the following facilities and/or Economic, Social, and Environmental categories (ESE), place an "X" in the blank opposite the item (or the Option designation). Where more than one option is to be considered, place its letter designation in the blank. A more comprehensive analysis of the impacts will be completed at a later date to comply with the National Environmental Policy Act (NEPA).

1.)	Hazardous Material Site or Underground Storage Tanks…….....	
2.)	Floodplains ……	**A, B**
3.)	Historical, archeological, cultural, or natural landmarks, or Cemeteries ……	**A, B**
4.)	Airport ……...	
5.)	Residential Establishment ……	**A, B**
6.)	Urban area, city, town, or community……...	**A, B**
7.)	Commercial area, shopping center ……	
8.)	Institutional Usages	
	a. School or other educational institution ……	
	b. Hospital or other medical facility ……...	
	c. Church or other religious institution ……	**A, B**
	d. Public Building, e.g., fire station……..	
	e. Defense installation…….....	
9.)	Agricultural land usage……..	**A, B**
10.)	Forested land ……	**A, B**
11.)	Industrial Park, factory..……	
12.)	Recreational usages:	
	a. Park or recreational area, State Natural Area……	**A, B**
	b. Wildlife refuge or wildlife management area…….....	**A, B**
13.)	Waterway:	
	a. Lake …….....	
	b. Pond ……	**B**
	c. River……	
	d. Stream……...	**A, B**
	e. Spring……	
14.)	Railroad Crossings……	
15.)	Study coordinated with MPO/RPO and/or local officials…….	**A, B**
16.)	Other ……	

6.6 Preliminary Structural Considerations

Eight (8) bridge structures exist along the study corridor. Option B will not affect any of the eight (8) existing bridge structures. It is estimated, however, that at least one (1) new bridge (approximately 1,500 feet long) will require construction as part of Option B. Depending on the specific alignment chosen, this bridge would be located just south of the Virginia State Line and would span the Elliott Branch Creek valley between the Fork and Snaggy Mountains in the Iron Mountain range.

Approximately 2,300 feet of tunnel construction through the western face of Fork Mountain in the Iron Mountain range is proposed as part of Option B as well. The tunnel would be located in Virginia approximately 1,000 feet north of the State Line.

Locations of the proposed bridge and tunnel are shown below in Figure 6.

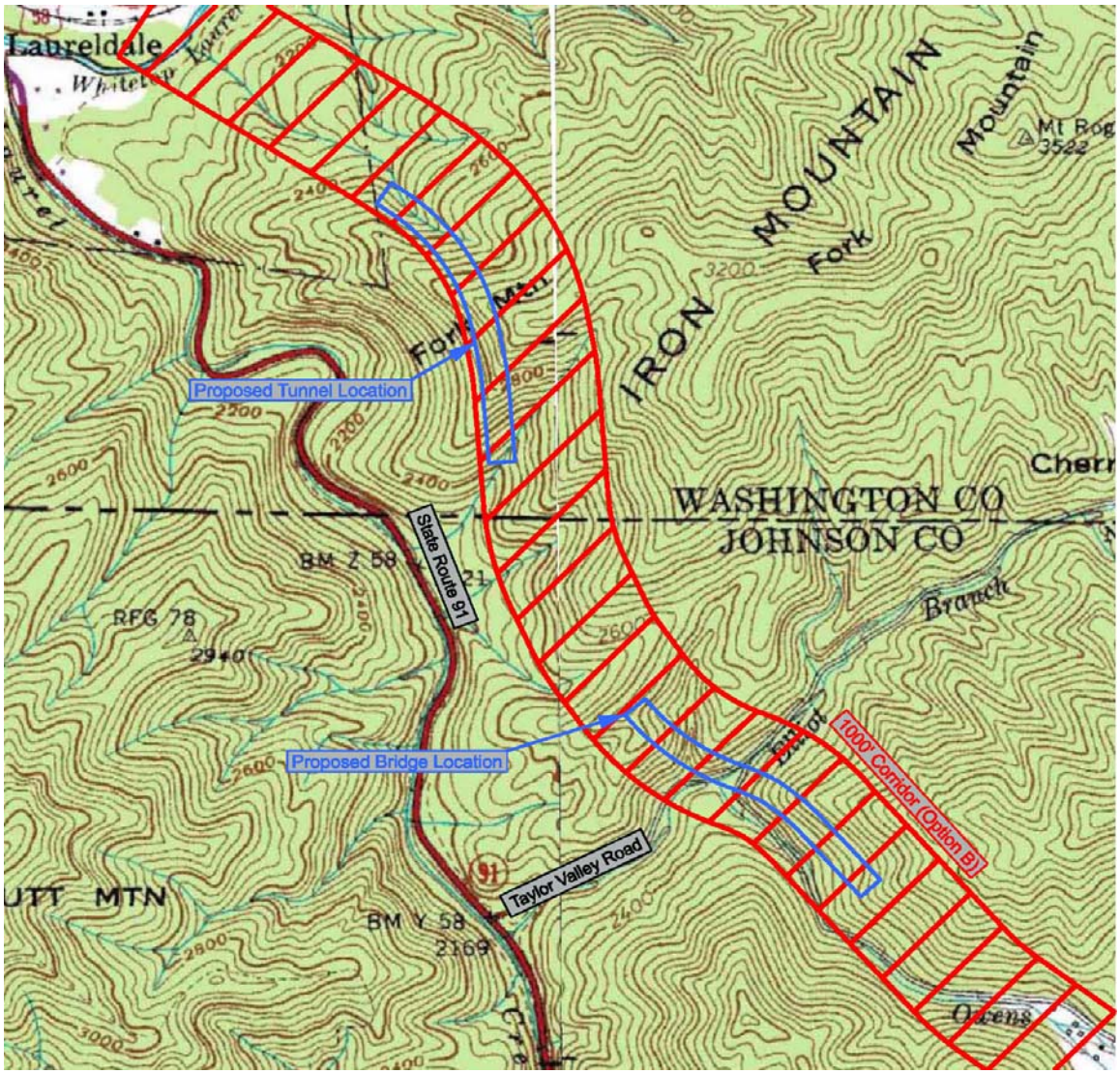


Figure 6. Proposed Bridge and Tunnel Locations.

7.0 ASSESSMENT OF CORRIDOR OPTIONS

TDOT has developed a set of seven (7) guiding principles by which all transportation projects are to be evaluated. These principles evaluate how all transportation improvement studies meet the established long-range statewide planning objectives. These guiding principles are discussed in the following paragraphs as they relate to the improvement of the SR 91 corridor in Johnson County.

Guiding Principle 1: Preserve and Manage the Existing Transportation System
Because the existing SR 91 corridor is not subject to foreseeable capacity or safety deficiencies, Option A will continue to meet the base mobility needs of this area. Preservation of SR 91 should be accomplished through on-going highway maintenance. Option B will manage the highway system in this area to a greater degree through improved travel efficiency and linkage by the construction of a modern highway facility with a higher design speed and modern design features.

Guiding Principle 2: Move a Growing, Diverse, and Active Population
The University of Tennessee Center for Business and Economic Research estimates that the population of Johnson County will decrease slightly over the planning study horizon, to a population of 17,933 in 2035[4]. SR 91 has served Johnson and the surrounding counties with basic mobility for many years and would be expected to continue to provide the same level of service at least through the 2036 design year. Despite the adequacy of Option A, Option B would enhance the north-south movement across the state line, decreasing travel time in the region for business growth opportunities, tourism, emergency services, and other important needs.

Guiding Principle 3: Support the State's Economy
Despite a drop in overall county population, recreational tourism will continue to bring visitors into the region, creating an opportunity for improved facilities for activity-based tourism. Linking northeast Tennessee's recreational destinations to established ones in Virginia is a growing regional economic opportunity. Option B best accomplishes this by accommodating non-motorized recreational trips on a new corridor and providing a lower traffic, scenic route on the existing SR 91 alignment.

Economic benefits brought by Option B may also be realized by providing shorter travel times from I-81 to new potential business opportunities in Johnson County and providing better routing for commercial trucks (approximately 10% of the traffic mix on SR 91).

Guiding Principle 4: Maximize Safety and Security
Crash records indicate that SR 91 has a crash rate approximately equivalent to the statewide average rate for similar roadway facilities.

In the event that existing SR 91 north of Mountain City becomes impassable, the alternative route to Damascus (west on SR 34 to Shady Valley, then north on SR 133 to Damascus) is more than 10 miles and approximately 22 minutes longer. While Option A maintains an adequately safe system linkage, Option B better fulfills the planning objective to maximize the security of the network by providing a desirable route redundancy in the event of a forced route closure.

[4] Tennessee State Data Center. University of Tennessee.

Option B also improves the safety of the existing corridor by providing standard width travel lanes, shoulders, and by separating higher speed through traffic and truck traffic from local, tourist, and non-motorized traffic.

Guiding Principle 5: Build Partnerships for Livable Communities
Both options have been developed with input from local stakeholders who are most interested in providing a modern roadway connection from the north into central Johnson County and Mountain City.

Option B also strives to make coordinated connections by capitalizing on adjacent highway improvements in both Tennessee and Virginia. Improvement to the SR 91 corridor along with a conceptual bypass around Damascus would result in a higher speed corridor from Mountain City to I-81 in Washington County, VA. Approximately four (4) miles of this connection in Tennessee is complete, and approximately ten (10) miles of this connection in Washington County, VA is either complete, under construction, or in a design phase. No formal plans or funding currently exist for a Damascus bypass or an improved routing through Damascus.

Guiding Principle 6: Promote Stewardship of the Environment
Given the topographic challenges of the study area, any construction along or adjacent to SR 91 would require significant environmental investigation. Option A is not expected to result in any required environmental mitigation, though future stream bank and/or slope stabilization work as part of regular on-going maintenance is feasible. Option B would result in significant earthwork and resulting environmental evaluation and permitting. This study is subject to all of the regulations of NEPA and these will be addressed in detail in the environmental phase of the study.

Guiding Principle 7: Emphasize Financial Responsibility
Planning level cost estimates were prepared for the improvement options for comparison purposes. TDOT's financial objectives include following a comprehensive transportation planning process, promoting coordination among public and private operators of transportation systems, and supporting efforts to provide stable funding for the public component of the transportation system. One or more of these strategies will be used in this study to promote financial efficiency and minimize taxpayer expenditures.

8.0 SUMMARY

The topographic variability of northern Johnson County has been a longstanding constraint to having a modern, high design speed roadway linkage north to I-81 and the regional communities of Washington County, VA. Improvement of approximately four (4) miles of SR 91 north of Mountain City and approximately ten (10) miles of US 58 south of Abingdon, VA is making the I-81 connection with Mountain City more feasible than under previous studies.

The current alignment of SR 91 exists as the primary connection north of Mountain City, serving local, regional, tourist, and commercial traffic. Traffic data have shown that the two (2) existing traffic lanes on SR 91 will adequately accommodate growing traffic volumes through the 2036 design year. A lack of developable land will preclude the demand for new points of access in this portion of Johnson County. Crash data have shown that the existing route is on par with other similar highways across the state with respect to crash rate. Option A is presented as a No-Build alternative and will continue to meet the basic mobility needs of this area for the foreseeable future. Option A has no additional cost beyond that required for on-going maintenance activity.

The study has presented a purpose and need for a higher degree of mobility for all users, to build upon recent and ongoing regional roadway improvement projects, and to extend the region's recreational tourism successes south into Johnson County. Option B more fully meets this purpose and need through construction of a new highway on a new alignment parallel to and east of the existing SR 91 alignment. The cross-section of Option B would be a two lane highway with paved shoulders and turning and climbing lanes where appropriate. Option B has an estimated cost of $178,622,000. It should also be noted that the implementation of Option B cannot be achieved without technical and financial cooperation from VDOT.

TENN.	YEAR	SHEET NO.
	2011	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

SHEET NO. DESCRIPTION

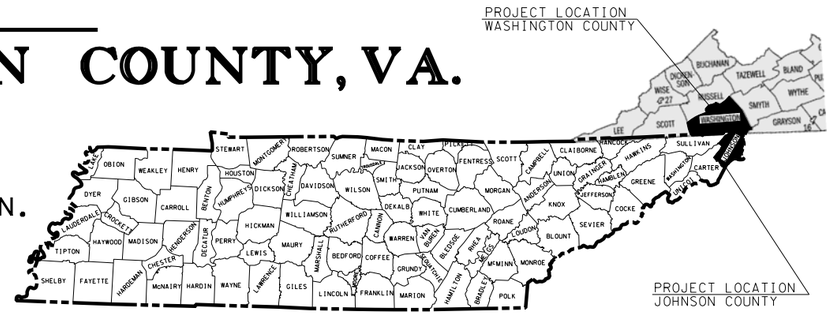
STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

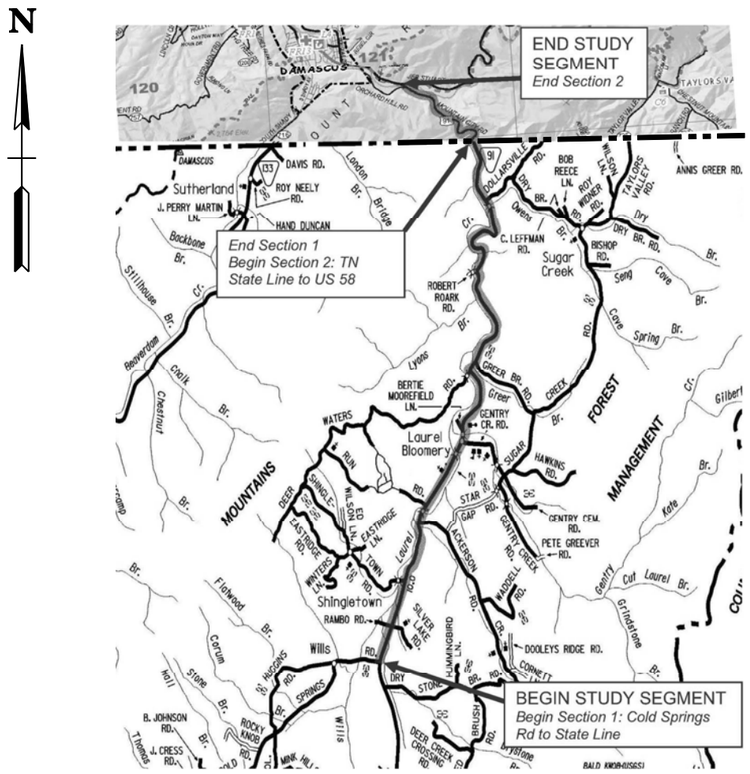
JOHNSON COUNTY, TN. & WASHINGTON COUNTY, VA.

TRANSPORTATION PLANNING REPORT

STATE ROUTE 91
FROM COLD SPRINGS ROAD, JOHNSON COUNTY, TN.
TO US 58, WASHINGTON COUNTY, VA.

STATE HIGHWAY NO. N/A F.A.H.S. NO. N/A





NOT TO SCALE

SPECIAL NOTES

PROPOSALS MAY BE REJECTED BY THE COMMISSIONER IF ANY OF THE UNIT PRICES CONTAINED THEREIN ARE OBVIOUSLY UNBALANCED, EITHER EXCESSIVE OR BELOW THE REASONABLE COST ANALYSIS VALUE.

THIS PROJECT TO BE CONSTRUCTED UNDER THE STANDARD SPECIFICATIONS OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION DATED MARCH 1, 2006 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT.

TDOT C.E. MANAGER 1 _____

DESIGNED BY RPM Transportation Consultants, LLC

DESIGNER _____ CHECKED BY _____

P.E. NO. _____

PIN NO. 114147.00

APPROVED:

_____
CHIEF ENGINEER

DATE: _____

APPROVED:

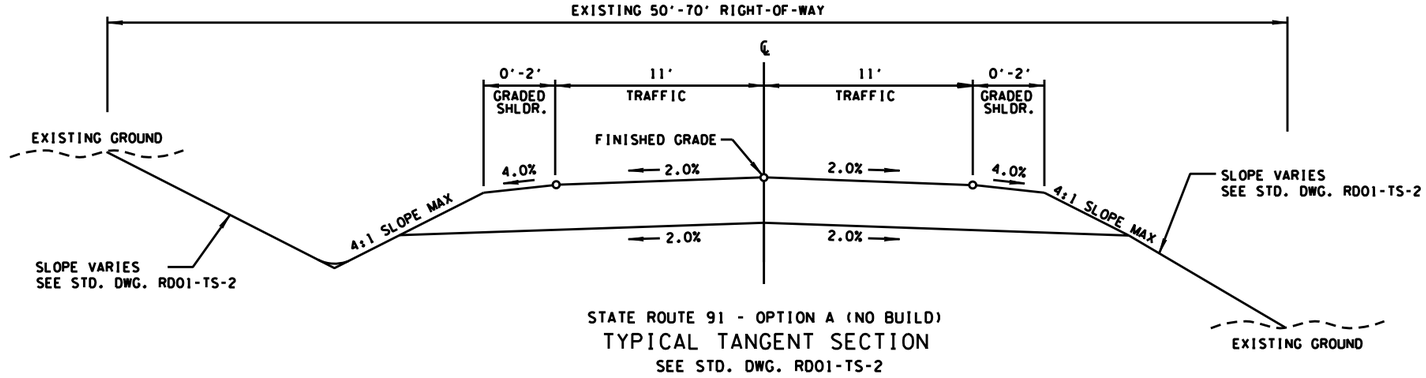
_____
COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

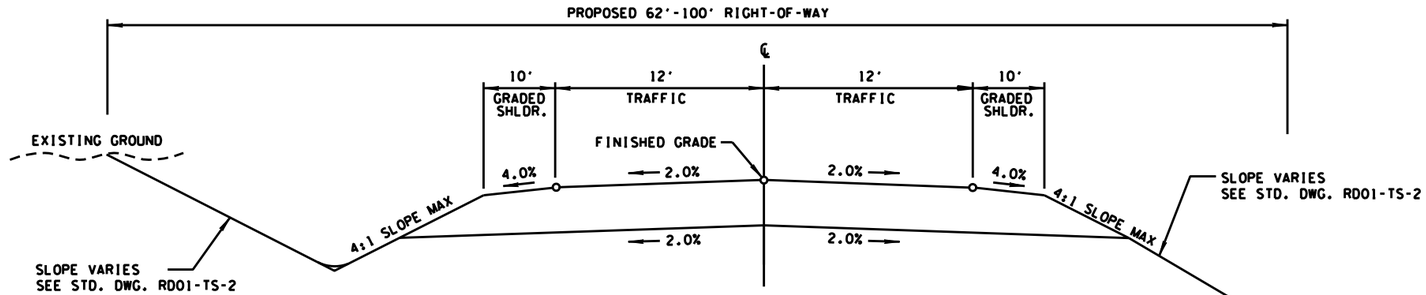
APPROVED:

_____ _____
DIVISION ADMINISTRATOR DATE

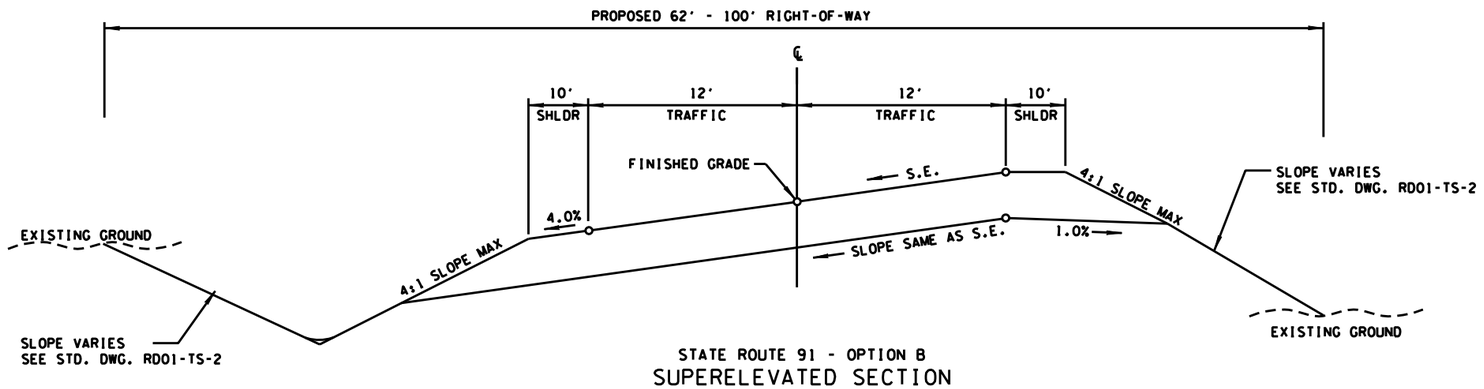
TYPE	YEAR	COUNTY	SHEET NO.
TPR	2011		2



STATE ROUTE 91 - OPTION A (NO BUILD)
TYPICAL TANGENT SECTION
SEE STD. DWG. RD01-TS-2



STATE ROUTE 91 - OPTION B
TYPICAL TANGENT SECTION
SEE STD. DWG. RD01-TS-2



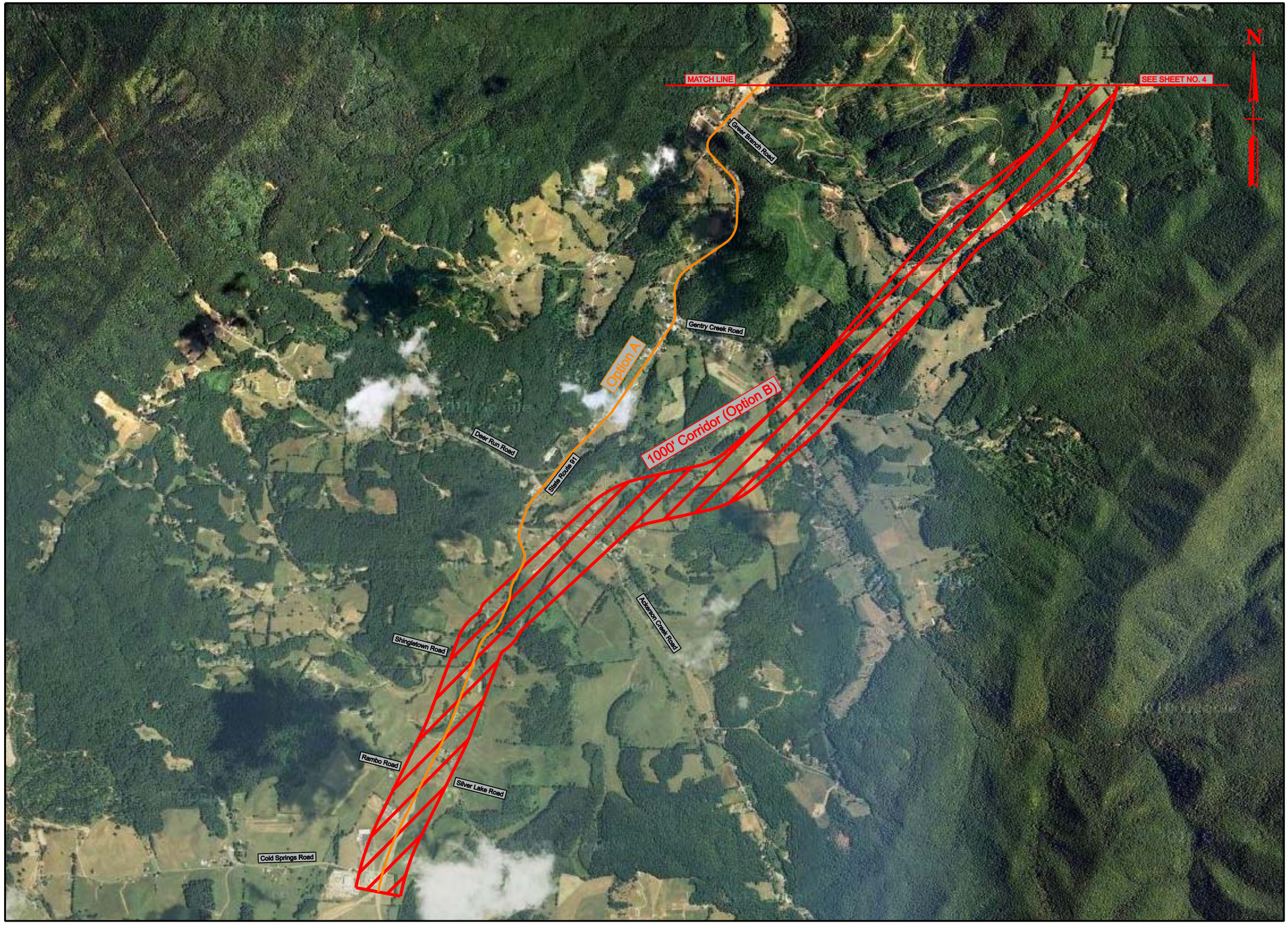
STATE ROUTE 91 - OPTION B
SUPERELEVATED SECTION
(BASED ON STD. DWG. RD01-TS-2)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 91
FROM COLD SPRINGS RD.
JOHNSON CO., TN. TO
US 58, WASHINGTON CO., VA.

TYPICAL SECTIONS

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2011		3

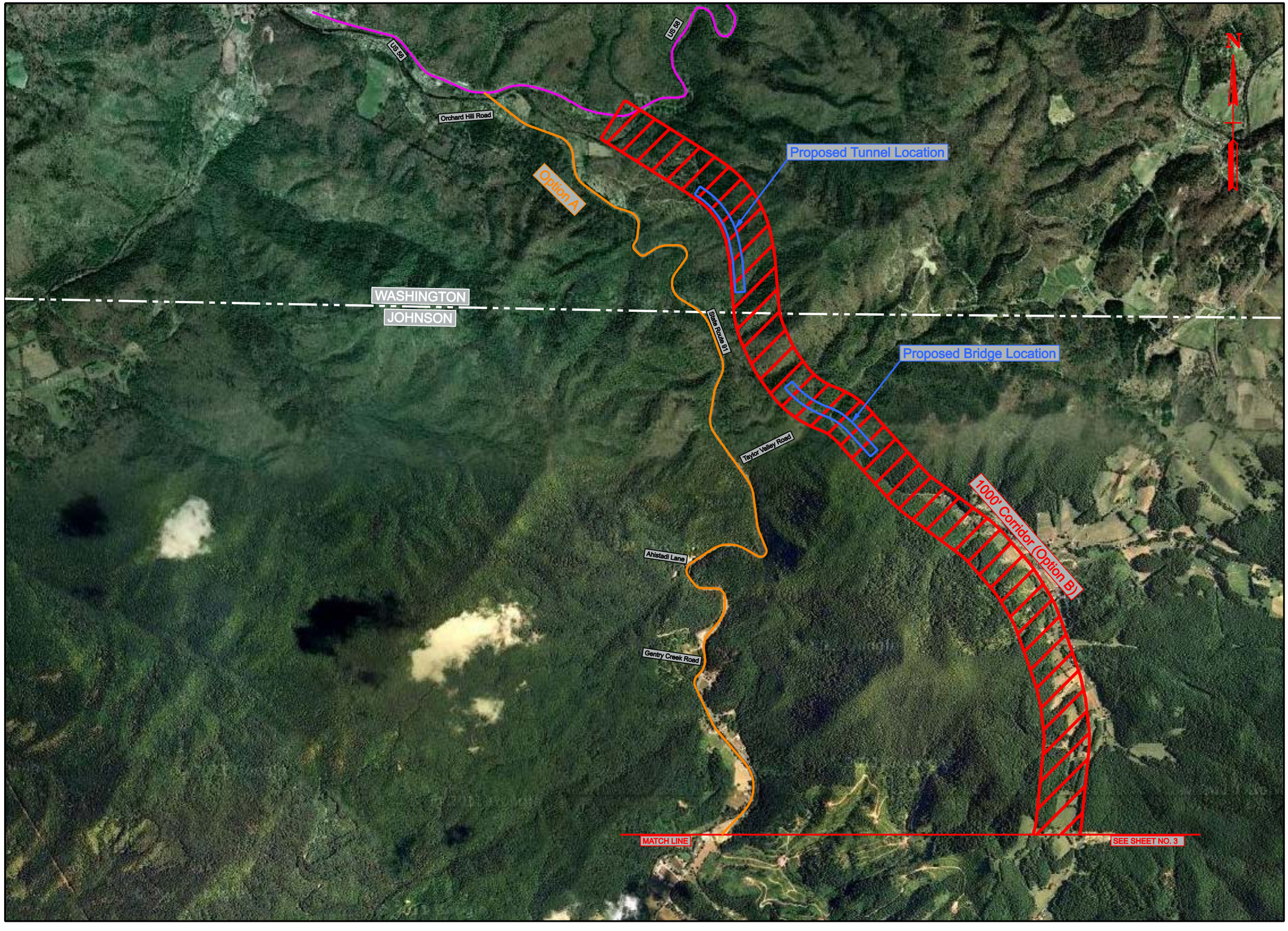


0 1000' 2000' 3000'

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 91
FROM COLD SPRINGS RD.,
JOHNSON CO., TN. TO
US 58, WASHINGTON CO., VA.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2011		4

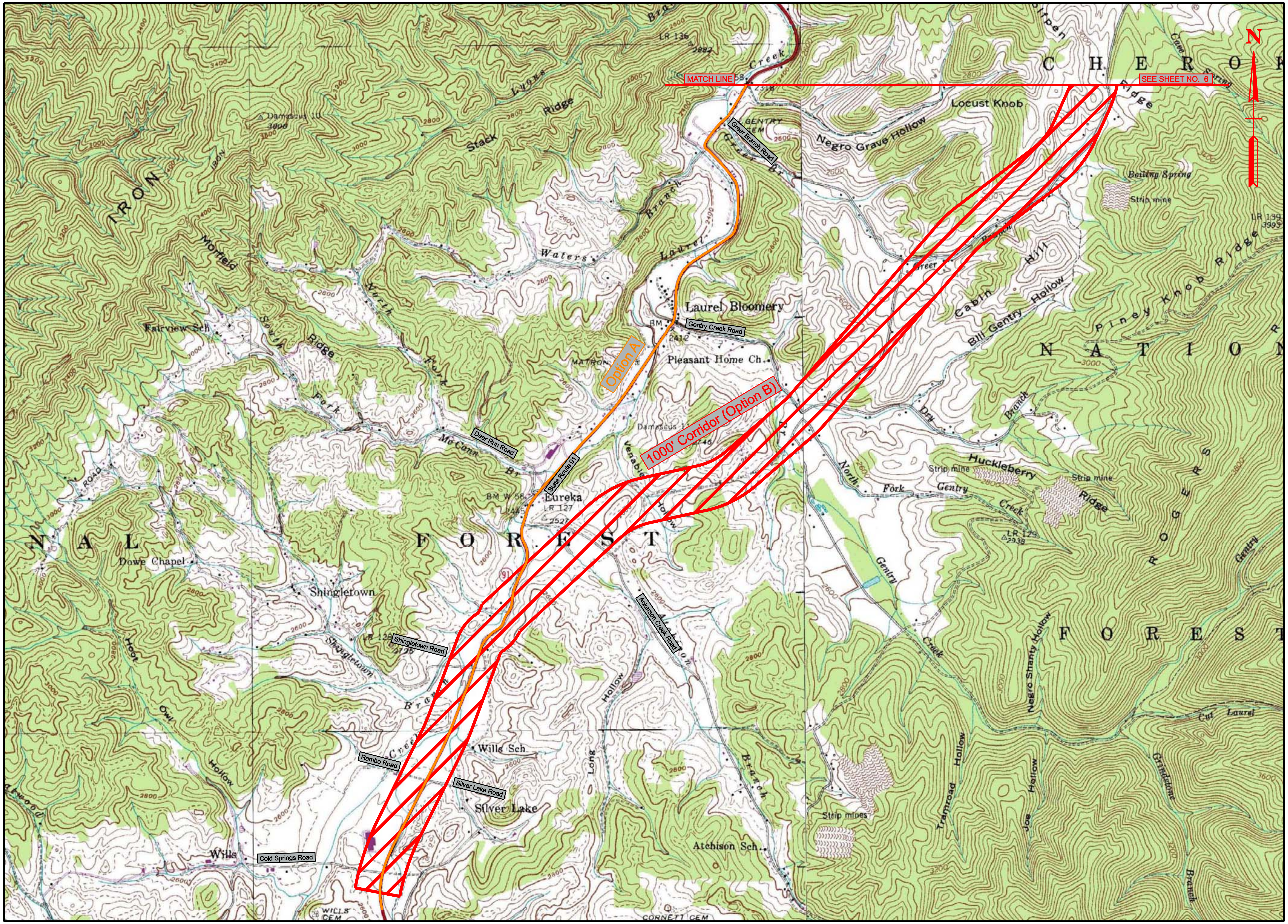


0 1000' 2000' 3000'

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 91
FROM COLD SPRINGS RD.,
JOHNSON CO., TN. TO
US 58, WASHINGTON CO., VA.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2011		5

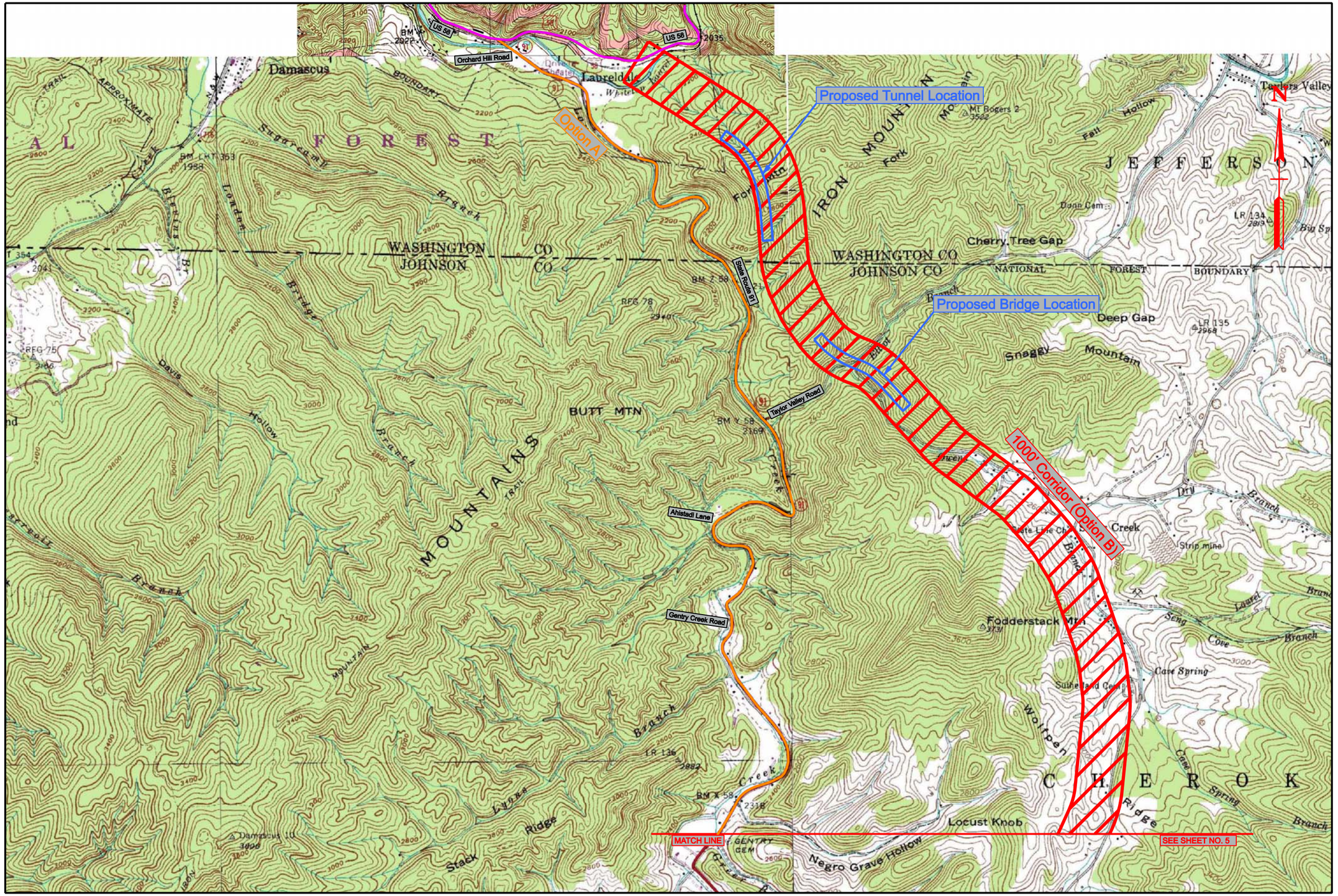


0 1000' 2000' 3000'

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 91
FROM COLD SPRINGS RD.
JOHNSON CO., TN. TO
US 58, WASHINGTON CO., VA.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2011		6



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STATE ROUTE 91
FROM COLD SPRINGS RD.
JOHNSON CO., TN. TO
US 58, WASHINGTON CO., VA.

SUPPLEMENTAL DATA APPENDIX

FOR THE

STATE ROUTE 91

TRANSPORTATION PLANNING REPORT

COLD SPRINGS ROAD TO VIRGINIA STATE LINE, JOHNSON COUNTY, TN
TENNESSEE STATE LINE TO US 58, WASHINGTON COUNTY, VA

COST PROJECTIONS

Route:	**SR 91 (Option B)**
Description:	**New alignment east of SR 91**
	Cold Springs Road to US 58
County:	**Johnson County**
Length:	**8.7± Miles**
Date:	**October 5, 2011**

	Section 1 (TN): Cold Springs Road to Tennessee State Line	Section 2 (VA): Tennessee State Line to US 58	Total
Right-of-Way	$ 3,608,000	$ 99,000	$ 3,707,000
Clearing and Grubbing	$ 179,000	$ 35,000	$ 214,000
Earthwork	$ 20,563,000	$ 2,982,000	$ 23,545,000
Pavement Removal	$ 88,000	$ 4,000	$ 92,000
Drainage	$ 3,700,000	$ 269,000	$ 3,969,000
Utilities	$ 529,000	$ 12,000	$ 541,000
Structures	$ 19,710,000	$ 67,170,000	$ 86,880,000
Railroad Crossing or Separation	$ -	$ -	$ -
Paving	$ 3,591,000	$ 475,000	$ 4,066,000
Retaining Walls	$ 2,289,000	$ 140,000	$ 2,429,000
Maintenance of Traffic	$ 15,000	$ -	$ 15,000
Topsoil	$ 696,000	$ -	$ 696,000
Seeding	$ 609,000	$ -	$ 609,000
Sodding	$ 243,000	$ -	$ 243,000
Signing & Pavent Markings	$ 22,000	$ 3,000	$ 25,000
Lighting	$ -	$ -	$ -
Signalization	$ -	$ -	$ -
Fencing	$ -	$ -	$ -
Guardrail	$ 1,146,000	$ 132,000	$ 1,278,000
Rip-Rap or Slope Protection	$ 200,000	$ -	$ 200,000
Other Construction Items (8.5%)	$ 4,510,000	$ 6,053,000	$ 10,563,000
Mobilization	$ 2,402,000	$ 2,498,000	$ 4,900,000
CONSTRUCTION COST	$ 59,973,000	$ 79,761,000	$ 139,734,000
Engineering and Contingency	$ 5,997,000	$ 7,976,000	$ 13,973,000
TOTAL CONSTRUCTION COST	$ 65,970,000	$ 87,737,000	$ 153,707,000
Preliminary Engineering (15%)	$ 8,996,000	$ 11,964,000	$ 20,960,000
PROJECT COST [1]	$ 79,103,000	$ 99,812,000	$ 178,915,000

[1] *For estimating future project costs, a compounded inflation rate of 10% should be applied from the date of this estimate.*

TRAFFIC PROJECTIONS

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: 46006-0237-14 ROUTE: SR-91
COUNTY: Johnson CITY: Mountain City
PROJECT PIN NUMBER: 114147.00
PROJECT DESCRIPTION: SR-91 corridor from Cool Spring Rd. to US-58 in Damascus, VA

DIVISION REQUESTING:

MAINTENANCE	☐	PAVEMENT DESIGN	☐
PLANNING	☒	STRUCTURES	☐
PROG. DEVELOPMENT & ADM.	☐	SURVEY & DESIGN	☐
PUBLIC TRANS. & AERO.	☐	TRAFFIC SIGNAL DESIGN	☐
		OTHER	☐

YEAR PROJECT PROGRAMMED FOR CONSTRUCTION:
PROJECTED LETTING DATE:

TRAFFIC ASSIGNMENT:

BASE YEAR		DESIGN YEAR					DESIGN ROADWAY % TRUCKS		DESIGN AVERAGE DAILY LOADS	
AADT	YEAR	AADT	DHV	%	YEAR	DIR.DIST.	DHV	AADT	FLEX	RIGID
3,540	2016	4,250	425	10	2036	65-35	5	7		

REQUESTED BY: NAME Gena Gilliam DATE 12/22/10
DIVISION Project Planning
ADDRESS Suite 1000 James K Polk Bldg
Nashville, TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 12-23-10
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

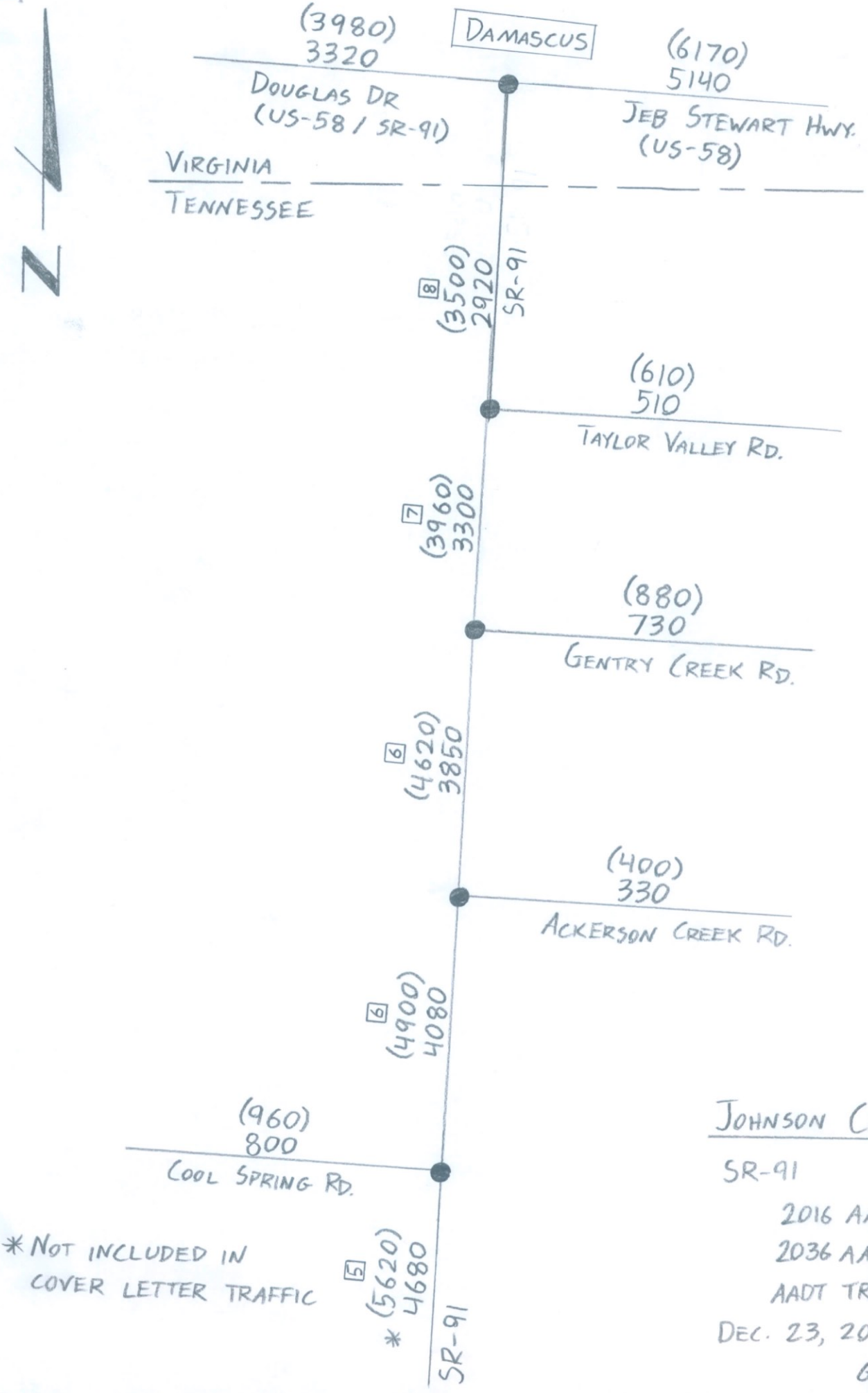
APPROVED BY: BILL HART Bill Hart DATE 12/23/10
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

This traffic is based on 2010 cycle counts. Design year traffic based on growth rate from the ADAM computer program. Truck percentage based on a classification count within the project limits, dated 10/20/2009.

DHV'S ARE NOT REQUIRED FOR SIDE ROADS LESS THAN 1000 AADT.

NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADT's OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS. (REV. 9/20/07)


N
(3980)
3320
DOUGLAS DR
(US-58 / SR-91)
DAMASCUS
(6170)
5140
JEB STEWART HWY.
(US-58)
VIRGINIA
TENNESSEE
8
(3500)
2920
SR-91
(610)
510
TAYLOR VALLEY RD.
7
(3960)
3300
(880)
730
GENTRY CREEK RD.
6
(4620)
3850
(400)
330
ACKERSON CREEK RD.
6
(4900)
4080
(960)
800
COOL SPRING RD.
5
(5620)
4680
*
SR-91
* NOT INCLUDED IN COVER LETTER TRAFFIC
JOHNSON COUNTY
SR-91
2016 AADT- 000
2036 AADT- (000)
AADT TRUCK % - 0
DEC. 23, 2010
G.K.D.

Route 91

From: Tennessee State Line

To: Route 58 East Intersection

YEAR	AADT	Trucks
09	2398	9
08	2509	9
07	2496	9
06	2704	9
05	2647	9

Route 58/91 Overlap

From: Route 91 East Intersection

To: Route T-1212 (Just inside Damascus ECL)

YEAR	AADT	Trucks
09	3129	7
08	3233	7
07	3256	7
06	3841	6
05	3821	7

Route 58

From: Route 91 East intersection

To: Route 603

YEAR	AADT	Trucks
09	682	2
08	714	2
07	710	2
06	721	1
05	706	1

D. A. "Donny" Necessary, Jr.

Virginia Department of Transportation

Bristol District Planner

870 Bonham Road

Bristol, VA

Office (276) 669-9956

Cell (276) 591-9545

ROADWAY CAPACITY ANALYSES

EXISTING SYSTEM

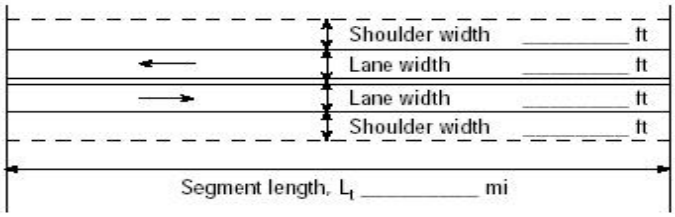
(2016 & 2036)

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*RPM*	Highway / Direction of Travel	*State Route 91*
Agency or Company	*RPM Transportation Consultants*	From/To	*Cold Springs Road to SR 58*
Date Performed	*7/6/2011*	Jurisdiction	*Johnson Co./Washington Co.*
Analysis Time Period	*Base Year 2016*	Analysis Year	*2016*

Project Description: *Base Conditions*

Input Data



☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *80%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *10*/mi

Analysis direction vol., V_d *304*veh/h

Opposing direction vol., V_o *164*veh/h

Shoulder width ft *2.0*

Lane Width ft *11.0*

Segment Length mi *8.4*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*2.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.925*	*0.907*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.74*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*425*	*271*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*50.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*3.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.3 mi/h*	Free-flow speed, FFS ($FSS=BFFS-f_{LS}-f_A$)	*44.5 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*35.8 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.6*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.947*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.79*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*405*	*244*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*40.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*46.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1659*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.4*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*337.8*
Effective width, Wv (Eq. 15-29) ft	*13.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.58*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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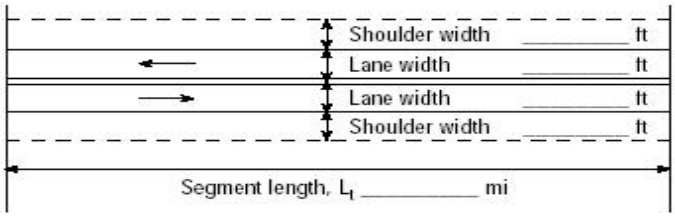
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*RPM*	Highway / Direction of Travel	*State Route 91*
Agency or Company	*RPM Transportation Consultants*	From/To	*Cold Springs Road to SR 58*
Date Performed	*7/6/2011*	Jurisdiction	*Johnson Co./Washington Co.*
Analysis Time Period	*Projected Year 2036*	Analysis Year	*2036*

Project Description: *Projected Conditions*

Input Data



Show North Arrow

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *80%*

Analysis direction vol., V_d *365*veh/h

% Trucks and Buses , P_T *7 %*

Opposing direction vol., V_o *197*veh/h

% Recreational vehicles, P_R *4%*

Shoulder width ft *2.0*

Access points *mi* *10*/mi

Lane Width ft *11.0*

Segment Length mi *8.4*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.931*	*0.913*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.90*	*0.77*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*484*	*311*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*50.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*3.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*2.5 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.1 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*44.5 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*35.3 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.90*	*0.81*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*463*	*283*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*40.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.27*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1659*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*79.2*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*405.6*
Effective width, Wv (Eq. 15-29) ft	*13.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*5.67*
Bicycle level of service (Exhibit 15-4)	*F*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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PROPOSED SYSTEM (OPTION B)

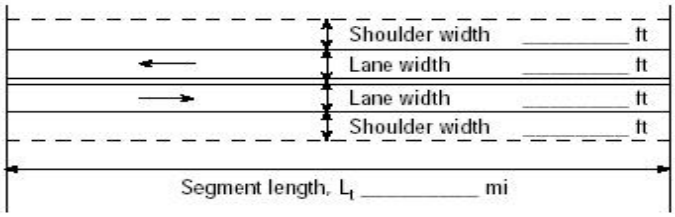
(2016 & 2036)

DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*RPM*	Highway / Direction of Travel	*State Route 91*
Agency or Company	*RPM Transportation Consultants*	From/To	*Cold Springs Road to SR 58*
Date Performed	*7/6/2011*	Jurisdiction	*Johnson Co./Washington Co.*
Analysis Time Period	*Projected Year 2036*	Analysis Year	*2036*

Project Description: *Projected Conditions - Proposed*

Input Data



Analysis direction vol., V_d *304* veh/h

Opposing direction vol., V_o *164* veh/h

Shoulder width ft *10.0*

Lane Width ft *12.0*

Segment Length mi *8.4*

Show North Arrow

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *80%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *5*/mi

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.1*	*2.4*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.925*	*0.907*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.86*	*0.74*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*425*	*271*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*50.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS} (Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*1.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.4 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*48.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.9 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-18 or 15-19)	*1.6*	*1.8*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.960*	*0.947*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.87*	*0.79*
Directional flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*405*	*244*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*40.3*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*46.2*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.1*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.24*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1659*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*81.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*337.8*
Effective width, Wv (Eq. 15-29) ft	*32.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*1.31*
Bicycle level of service (Exhibit 15-4)	*A*
Notes	

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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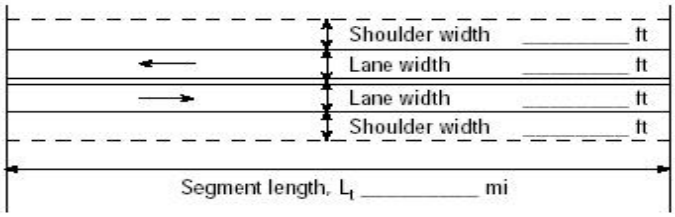
DIRECTIONAL TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	*RPM*	Highway / Direction of Travel	*State Route 91*
Agency or Company	*RPM Transportation Consultants*	From/To	*Cold Springs Road to SR 58*
Date Performed	*7/6/2011*	Jurisdiction	*Johnson Co./Washington Co.*
Analysis Time Period	*Projected Year 2036*	Analysis Year	*2036*

Project Description: *Projected Conditions - Proposed ÆÀ¡B*

Input Data



Show North Arrow

☐ Class I highway ☑ Class II highway ☐ Class III highway

Terrain ☐ Level ☑ Rolling

Grade Length mi Up/down

Peak-hour factor, PHF *0.90*

No-passing zone *80%*

% Trucks and Buses , P_T *7 %*

% Recreational vehicles, P_R *4%*

Access points *mi* *5*/mi

Analysis direction vol., V_d *365*veh/h

Opposing direction vol., V_o *197*veh/h

Shoulder width ft *10.0*

Lane Width ft *12.0*

Segment Length mi *8.4*

Average Travel Speed

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T (Exhibit 15-11 or 15-12)	*2.0*	*2.3*
Passenger-car equivalents for RVs, E_R (Exhibit 15-11 or 15-13)	*1.1*	*1.1*
Heavy-vehicle adjustment factor, $f_{HV,ATS}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.931*	*0.913*
Grade adjustment factor[1], $f_{g,ATS}$ (Exhibit 15-9)	*0.90*	*0.77*
Demand flow rate[2], v_i (pc/h) $v_i=V_i/(PHF*f_{g,ATS}*f_{HV,ATS})$	*484*	*311*

Free-Flow Speed from Field Measurement		**Estimated Free-Flow Speed**	
Mean speed of sample[3], S_{FM}		Base free-flow speed[4], BFFS	*50.0 mi/h*
Total demand flow rate, both directions, *v*		Adj. for lane and shoulder width,[4] f_{LS}(Exhibit 15-7)	*0.0 mi/h*
Free-flow speed, $FFS=S_{FM}+0.00776(v/f_{HV,ATS})$		Adj. for access points[4], f_A (Exhibit 15-8)	*1.3 mi/h*
Adj. for no-passing zones, $f_{np,ATS}$ (Exhibit 15-15)	*3.2 mi/h*	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	*48.8 mi/h*
		Average travel speed, $ATS_d=FFS-0.00776(v_{d,ATS}+v_{o,ATS})-f_{np,ATS}$	*39.4 mi/h*

Percent Time-Spent-Following

	Analysis Direction (d)	Opposing Direction (o)
Passenger-car equivalents for trucks, E_T(Exhibit 15-18 or 15-19)	*1.4*	*1.7*
Passenger-car equivalents for RVs, E_R (Exhibit 15-18 or 15-19)	*1.0*	*1.0*
Heavy-vehicle adjustment factor, $f_{HV}=1/(1+P_T(E_T-1)+P_R(E_R-1))$	*0.973*	*0.953*
Grade adjustment factor[1], $f_{g,PTSF}$ (Exhibit 15-16 or Ex 15-17)	*0.90*	*0.81*
Directional flow rate[2], v_i(pc/h) $v_i=V_i/(PHF*f_{HV,PTSF}*f_{g,PTSF})$	*463*	*283*
Base percent time-spent-following[4], $BPTSF_d(\%)=100(1-e^{av_d^b})$	*44.4*	
Adj. for no-passing zone, $f_{np,PTSF}$ (Exhibit 15-21)	*40.4*	
Percent time-spent-following, $PTSF_d(\%)=BPTSF_d+f_{np,PTSF}*(v_{d,PTSF}/v_{d,PTSF}+v_{o,PTSF})$	*69.5*	

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 15-3)	*C*
Volume to capacity ratio, *v/c*	*0.27*

Capacity, $C_{d,ATS}$ (Equation 15-12) pc/h	*1659*
Capacity, $C_{d,PTSF}$ (Equation 15-13) pc/h	*1700*
Percent Free-Flow Speed $PFFS_d$(Equation 15-11 - Class III only)	*80.9*
Bicycle Level of Service	
Directional demand flow rate in outside lane, v_{OL} (Eq. 15-24) veh/h	*405.6*
Effective width, Wv (Eq. 15-29) ft	*32.00*
Effective speed factor, S_t (Eq. 15-30)	*4.42*
Bicycle level of service score, BLOS (Eq. 15-31)	*1.40*
Bicycle level of service (Exhibit 15-4)	*A*

Notes

1. Note that the adjustment factor for level terrain is 1.00,as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If v_i(v_d or v_o) >=1,700 pc/h, terminate analysis--the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only
5. Exhibit 15-20 provides coefficients a and b for Equation 15-10.
6. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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ENVIRONMENTAL DOCUMENTATION

Tennessee Department of Transportation
EARLY ENVIRONMENTAL SCREENING PROCESS (EES)
PROJECT SCORING

Project Score Factors

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
Project Impact Areas:	15	15	Complete
Date of Evaluation:	July 28, 2011		
Evaluation done by:	Gena Gilliam		
	Transportation Planner 4		
County:	Johnson		
Route:	State Route 91		
PIN:	114147.00		
Termini:	from N. of Cold Spring Rd. to US 58 in Damascus, VA		

Impact Ranking of Features Evaluated:	**Total by Rank**
Features with No Impact	**6**
Bat	
Aquatic Species	
Superfund Sites	
Caves	
Railroads	
Tennessee Natural Areas Program	
Features with Low Impact	**1**
Cemetery Sites & Cemetery Properties	
Features with Moderate Impact	**3**
National Register Sites	
Terrestrial Species	
Pyritic Rock	

Features with Substantial Impact **4**

TDEC Conservation Sites & TDEC Scenic Waterways

Large Wetland Impacts

Wildlife Management Areas

TWRA Lakes & Other Public Lands

Community Impacts Present:

Institutions:

Church

Populations:

No population present

Linguistically isolated populations

Populations below poverty - State average- 13%

EES Project Impact: **Complete**

Impacts Evaluated Within 1,000 Ft of Study Area

CEMETERY SITES & CEMETERY PROPERTIES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	☑ **Low** - Low impact on the project is anticipated as there is a cemetery abutting the project study area or corridor. It is anticipated that a 'normal' effort will be required to complete this environmental review as part of NEPA.

INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS

Sensitive Populations Project Impact:	Present	Not Present
Institutions:		
Hospital	☐	☑
School	☐	☑
Church	☑	☐
Public Building	☐	☑
Populations:		
No population present	☑	☐
65 and older populations	☐	☑
Disability populations	☐	☑
Households without a vehicle	☐	☑
Minority populations 24%	☐	☑
Linguistically isolated populations	☑	☐

Populations below poverty - State average - 13%	☑	☐
Populations below poverty - State average - 27%	☐	☑

BAT

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated. There is no occurrence of Indiana or gray bats within 4 miles of the proposed project study area or corridor.

RAILROADS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No impact on the project is anticipated. There are no railroads located within the project study area or corridor.

Impacts Evaluated Within 2,000 Ft of Study Area

NATIONAL REGISTER SITES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium impact on the project is anticipated as there is a National Register historic property within the project study area or corridor. It is possible to avoid a taking of the historic property. There may be visual or audible effects upon the survey site and/or historic property that need to be considered and minimized. An environmental impact may still result and necessitate coordination with State Historic Preservation Office as part of NEPA. With more precise project location and design, direct impacts of the tract can be avoid and not require any taking of the surveyed sites or listed properties. Indirect effects (visual and audible) upon the surveyed sites or listed properties need to be reviewed.

SUPERFUND SITES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.

PYRITIC ROCK

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium project impact is anticipated in the project study area or corridor. Formations that may contain acid producing rock (symbolized as orange or pink in color) are anticipated in small quantities. A greater than normal design is anticipated to perform geotechnical studies and analysis and design (i.e., containment measures and minimize

	disturbance/ movement of pyritic rock during construction). More effort is likely needed to: identify additional right of way to 'waste' material, secure permits, and design project blending of pyritic materials. Minimal long term efforts are anticipated to ensure performance of containment measures.

TWRA LAKES & OTHER PUBLIC LANDS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Substantial** – A substantial impact on the project is anticipated as a park lies within a project study area or corridor. It is not possible to locate the proposed transportation project within the existing project study area or corridor in such a way that it avoids any impacts or takings of the park property. A high level of effort and time will be required for Section 4 (f) documentation to resolve the project's environmental impact on the park and to move forward with project development. Additional design will be needed to locate and design of the proposed transportation project in such a way that it minimizes impacts or takings of the park property. Indirect impacts (audible and visual) to the park may occur and need to be studied. If there is indirect impact, additional design would be needed to design the appropriate mitigation measures.

Impacts Evaluated Within 4,000 Ft of Study Area

TERRESTRIAL SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered located within the project study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.

TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)	☑ **Substantial** – A substantial project impact is likely as a scenic waterway or TDEC Conservation Site is within the project study area or corridor. An impact to the scenic waterway cannot be avoided and will likely be major. These impacts likely will involve a new location project, a new stream crossing (bridge replacement), and/or relocation of a stream. Additional design effort will be needed with the analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing a scenic waterway. Project impact will include analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing a scenic waterway.

LARGE WETLAND IMPACTS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)	☑ **Substantial** – Regions 1, 2, and 3: A substantial impact to the project is probable as there is greater than 2 acres of wetlands within the project study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.

TENNESSEE NATURAL AREAS PROGRAM

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.

WILDLIFE MANAGEMENT AREAS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Substantial** – A substantial impact on the project is anticipated as WMA is located within the transportation project study area or corridor. There is no way to avoid an impact or taking (bisecting or fragmenting) of a WMA. In-depth coordination with TWRA will be necessary. It is anticipated that there will e much design effort to minimize measures for the WMA (bridging, dry culvert crossings, etc), and to coordinate minimization and mitigation effort with TWRA for their approval.

Impacts Evaluated Within 10,000 Ft of Study Area

AQUATIC SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** - No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected aquatic species within the project study area or corridor.

CAVES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated as there are no caves in the project study area or corridor.

EES Report

PIN 114147.00

4,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Terrestrial Species

Total= 12

	USESA	SPROT
Symplocarpus foetidus		E
Galium palustre		S
Oenothera parviflora		S
Corvus corax		T
Minuartia godfreyi		E
Dryopteris cristata		T
Hexastylis virginica		S
Cardamine rotundifolia		S
Dryopteris cristata		T
Cymophyllus fraserianus		S
Hydrophyllum virginianum		T
Scutellaria saxatilis		T

TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites — Total= **2**

- LAUREL CREEK TNC REGISTRY
- IRON MOUNTAIN

TDEC Scenic Waterways — None were found

Large Wetland Impacts

Total Acerage= 6.66

0.23	acres
0.16	acres
0.21	acres
0.36	acres
0.34	acres
0.16	acres
0.17	acres
0.55	acres
0.15	acres
0.20	acres
1.70	acres
0.16	acres
0.54	acres
0.43	acres
0.83	acres
0.21	acres
0.26	acres

PIN 114147.00

4,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Tennessee Natural Areas Program

None were found

Wildlife Management Areas

Total= 1

North Cherokee NF & WMA

EES Report

PIN 114147.00
2,000 Foot Corridor

Option: 114147_4602V01
Version Date: July 25, 2011
Created by: JONATHAN ROGERS

National Register Sites

Total= 1

Morrison Farm and Store

Superfund Sites

None were found

Pyritic Rock

Classification

Total= 4

May Contain Potentially Acid Producing Rock

Cranberry Granite

Unicoi Formation

Unicoi Formation

Unicoi Formation

TWRA Lakes & Other Public Lands

TWRA Lakes

None were found

Other Public Lands

Total= 1

North Cherokee NF

EES Report

PIN 114147.00

1,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Cemetery Sites & Cemetery Properties

Cemetery Sites — Total= 1

- Matron Cemetery

Cemetery Property — None were found

Institutions & Sensitive Community Populations

Institutions: — Total= 2

Church	State Line Church
Church	Bethel Church (Historical)

Populations:

No population present	Present
65 & older populations	None were found
Disability populations	None were found
Households without a vehicle	None were found
Minority populuations 24%	None were found
Linguistically isolated populations	Present
Populations below poverty-State average-13%	Present
Populations below poverty-State average-27%	None were found

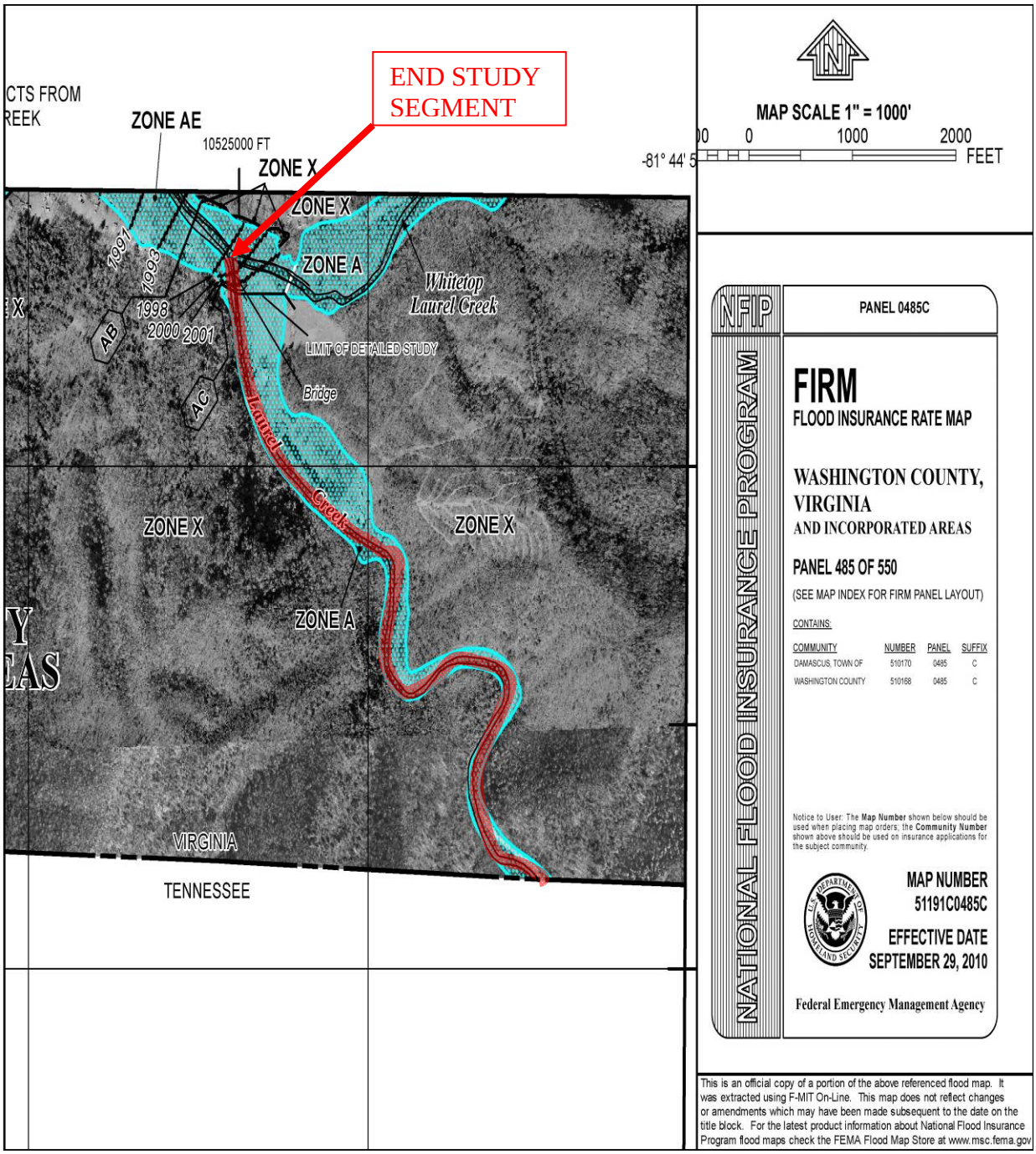
Bat — None were found

Railroads — None were found

EES Report

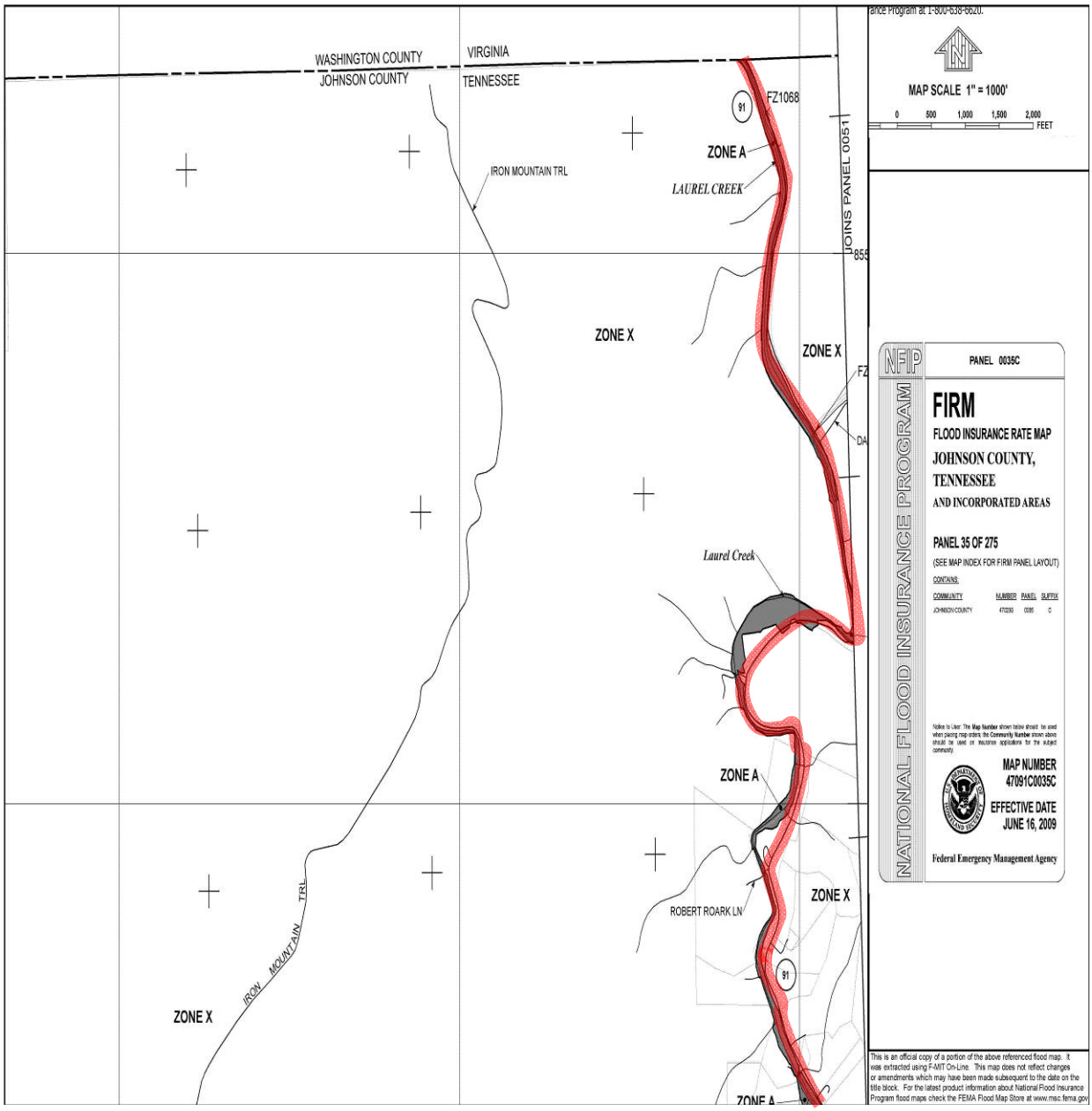
PIN	114147.00	Option:	114147_4602V01
10,000 Foot Corridor		Version Date:	July 25, 2011
		Created by:	JONATHAN ROGERS

Aquatic Species	None were found
Caves	None were found



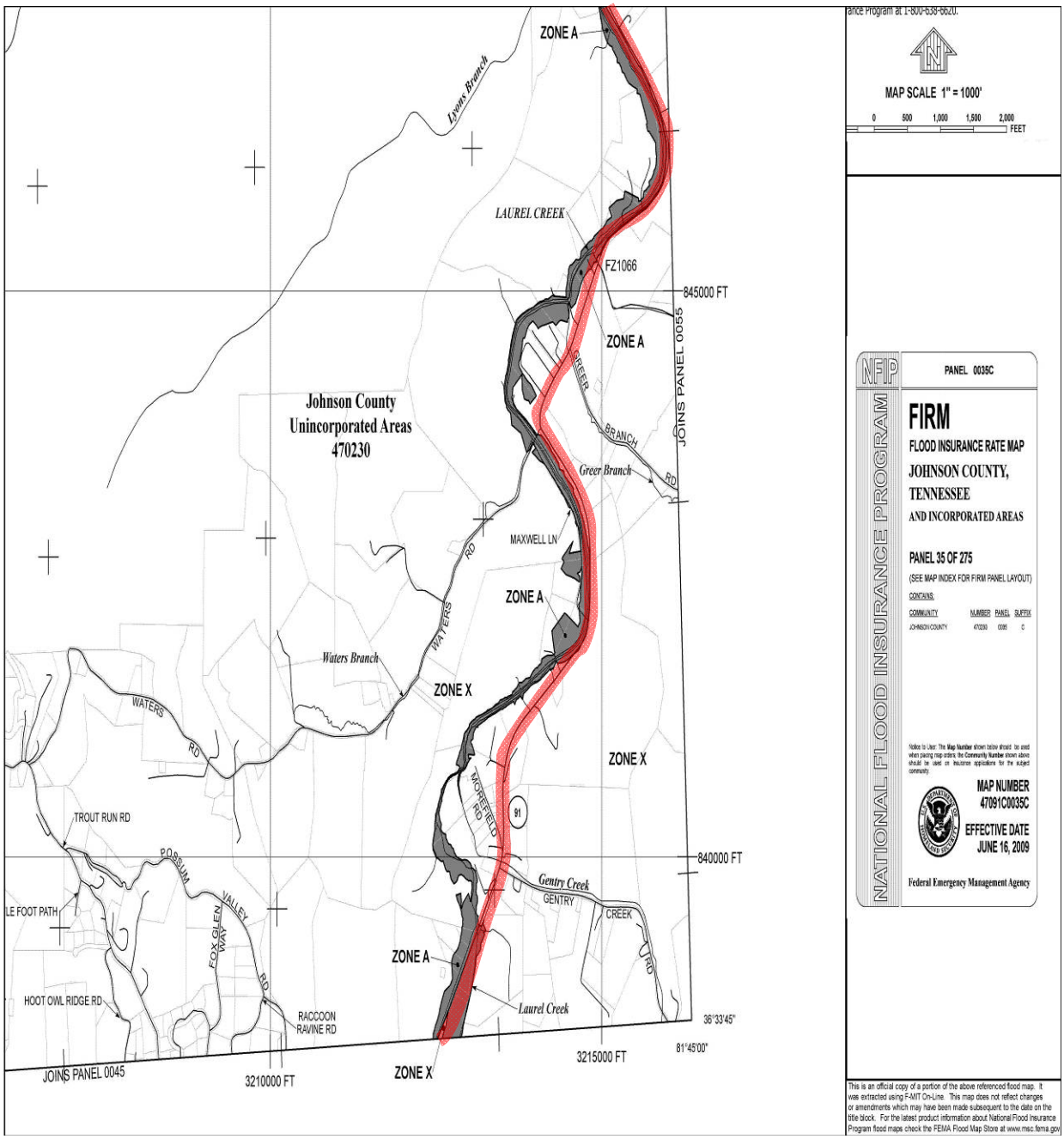
Source: FEMA (Federal Emergency Management Agency) Flood Maps. Not to Scale

Flood Map (1 of 5)
State Route 91, Johnson County
L.M. 14.33 – 15.95



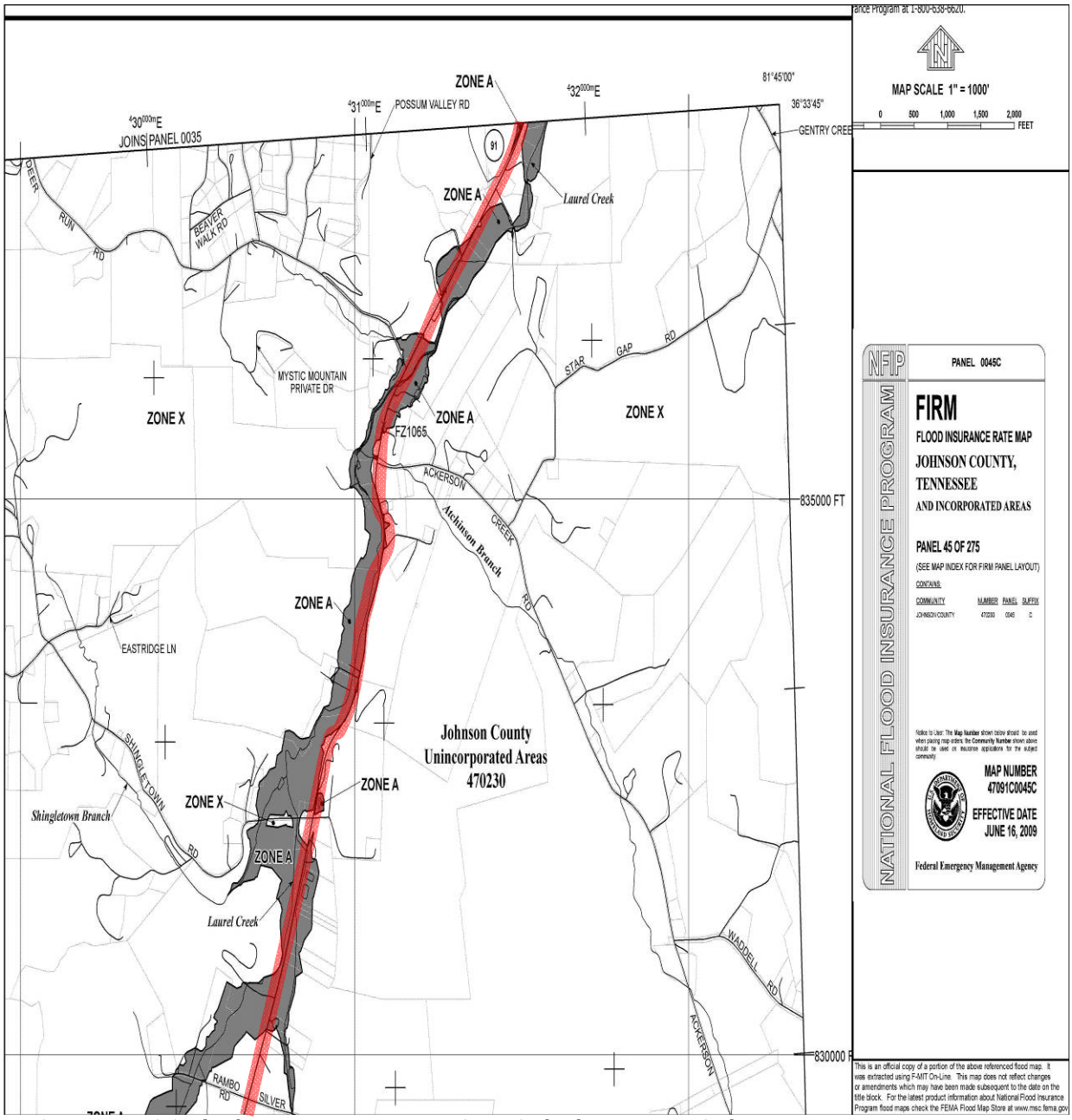
Source: FEMA (Federal Emergency Management Agency) Flood Maps. Not to Scale

Flood Map (2 of 5)
State Route 91, Johnson County
L.M. 12.00 – 14.33



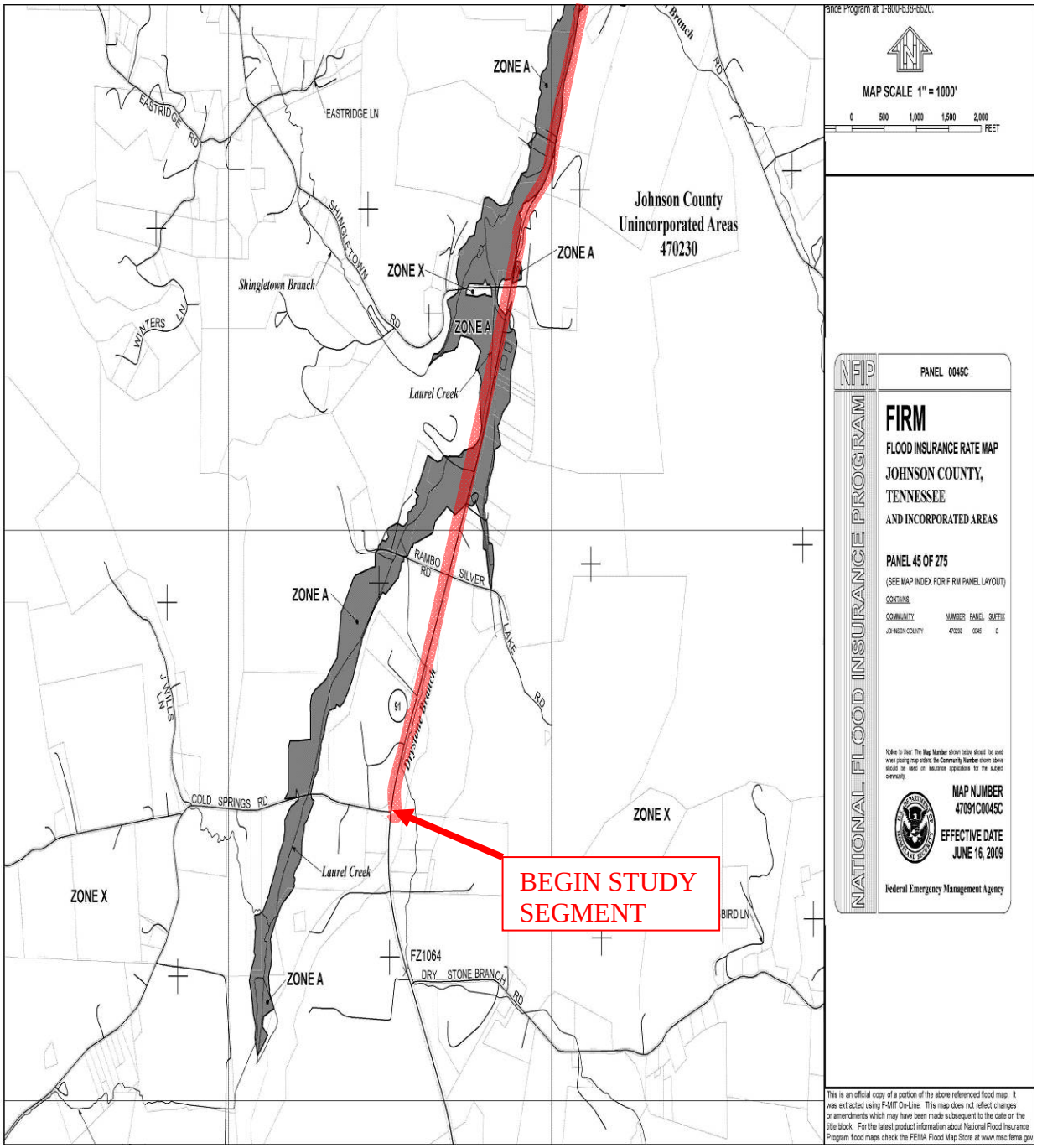
Source: FEMA (Federal Emergency Management Agency) Flood Maps. Not to Scale

Flood Map (3 of 5)
State Route 91, Johnson County
L.M. 9.54 – 12.00



Source: FEMA (Federal Emergency Management Agency) Flood Maps. Not to Scale

Flood Map (4 of 5)
State Route 91, Johnson County
L.M. 7.94 – 9.54



Source: FEMA (Federal Emergency Management Agency) Flood Maps. Not to Scale

Flood Map (5 of 5)
State Route 91, Johnson County
L.M. 7.52 – 9.12

Tennessee Department of Transportation
EARLY ENVIRONMENTAL SCREENING PROCESS (EES)
PROJECT SCORING

Project Score Factors

	Total Impacts Evaluated	Total Impacts to Evaluate	EES Evaluation
Project Impact Areas:	15	15	Complete
Date of Evaluation:	July 28, 2011		
Evaluation done by:	Gena Gilliam		
	Transportation Planner 4		
County:	Johnson		
Route:	State Route 91		
PIN:	114147.00		
Termini:	from N. of Cold Spring Rd. to US 58 in Damascus, VA		

Impact Ranking of Features Evaluated:	**Total by Rank**
Features with No Impact	**6**
Bat	
Aquatic Species	
Superfund Sites	
Caves	
Railroads	
Tennessee Natural Areas Program	
Features with Low Impact	**1**
Cemetery Sites & Cemetery Properties	
Features with Moderate Impact	**3**
National Register Sites	
Terrestrial Species	
Pyritic Rock	

Features with Substantial Impact **4**

TDEC Conservation Sites & TDEC Scenic Waterways

Large Wetland Impacts

Wildlife Management Areas

TWRA Lakes & Other Public Lands

Community Impacts Present:

Institutions:

Church

Populations:

No population present

Linguistically isolated populations

Populations below poverty - State average- 13%

EES Project Impact: **Complete**

Impacts Evaluated Within 1,000 Ft of Study Area

CEMETERY SITES & CEMETERY PROPERTIES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	☑ **Low** - Low impact on the project is anticipated as there is a cemetery abutting the project study area or corridor. It is anticipated that a 'normal' effort will be required to complete this environmental review as part of NEPA.

INSTITUTIONS & SENSITIVE COMMUNITY POPULATIONS

Sensitive Populations Project Impact:	Present	Not Present
Institutions:		
Hospital	☐	☑
School	☐	☑
Church	☑	☐
Public Building	☐	☑
Populations:		
No population present	☑	☐
65 and older populations	☐	☑
Disability populations	☐	☑
Households without a vehicle	☐	☑
Minority populations 24%	☐	☑
Linguistically isolated populations	☑	☐

Populations below poverty - State average - 13%	☑	☐
Populations below poverty - State average - 27%	☐	☑

BAT

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated. There is no occurrence of Indiana or gray bats within 4 miles of the proposed project study area or corridor.

RAILROADS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No impact on the project is anticipated. There are no railroads located within the project study area or corridor.

Impacts Evaluated Within 2,000 Ft of Study Area

NATIONAL REGISTER SITES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium impact on the project is anticipated as there is a National Register historic property within the project study area or corridor. It is possible to avoid a taking of the historic property. There may be visual or audible effects upon the survey site and/or historic property that need to be considered and minimized. An environmental impact may still result and necessitate coordination with State Historic Preservation Office as part of NEPA. With more precise project location and design, direct impacts of the tract can be avoid and not require any taking of the surveyed sites or listed properties. Indirect effects (visual and audible) upon the surveyed sites or listed properties need to be reviewed.

SUPERFUND SITES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated as there are no known contaminated land tracts abutting or within the project study area or corridor.

PYRITIC ROCK

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium project impact is anticipated in the project study area or corridor. Formations that may contain acid producing rock (symbolized as orange or pink in color) are anticipated in small quantities. A greater than normal design is anticipated to perform geotechnical studies and analysis and design (i.e., containment measures and minimize

	disturbance/ movement of pyritic rock during construction). More effort is likely needed to: identify additional right of way to 'waste' material, secure permits, and design project blending of pyritic materials. Minimal long term efforts are anticipated to ensure performance of containment measures.

TWRA LAKES & OTHER PUBLIC LANDS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Substantial** – A substantial impact on the project is anticipated as a park lies within a project study area or corridor. It is not possible to locate the proposed transportation project within the existing project study area or corridor in such a way that it avoids any impacts or takings of the park property. A high level of effort and time will be required for Section 4 (f) documentation to resolve the project's environmental impact on the park and to move forward with project development. Additional design will be needed to locate and design of the proposed transportation project in such a way that it minimizes impacts or takings of the park property. Indirect impacts (audible and visual) to the park may occur and need to be studied. If there is indirect impact, additional design would be needed to design the appropriate mitigation measures.

Impacts Evaluated Within 4,000 Ft of Study Area

TERRESTRIAL SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium impact on the project is likely as there is a known federally-protected terrestrial species or a state protected species with a status of threatened or endangered located within the project study area or corridor, and it is possible to avoid any impacts to the species with additional design. Additional alternatives will likely eliminate impacts to the species. Additional design alternatives and minimizations may be required if additional populations are found during required field surveys.

TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)	☑ **Substantial** – A substantial project impact is likely as a scenic waterway or TDEC Conservation Site is within the project study area or corridor. An impact to the scenic waterway cannot be avoided and will likely be major. These impacts likely will involve a new location project, a new stream crossing (bridge replacement), and/or relocation of a stream. Additional design effort will be needed with the analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing a scenic waterway. Project impact will include analysis, coordination, and negotiation to resolve Section 4(f) issue(s) associated with the crossing a scenic waterway.

LARGE WETLAND IMPACTS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)	☑ **Substantial** – Regions 1, 2, and 3: A substantial impact to the project is probable as there is greater than 2 acres of wetlands within the project study area or corridor. Compensatory mitigation will be required. Design effort will be needed to avoid and minimize impacts to wetlands to the maximum extent practicable. If a floodplain is crossed by the project, floodplain culverts may be necessary.

TENNESSEE NATURAL AREAS PROGRAM

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No impact on the project is anticipated as the project study area or corridor does not include a Natural Area.

WILDLIFE MANAGEMENT AREAS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Substantial** – A substantial impact on the project is anticipated as WMA is located within the transportation project study area or corridor. There is no way to avoid an impact or taking (bisecting or fragmenting) of a WMA. In-depth coordination with TWRA will be necessary. It is anticipated that there will e much design effort to minimize measures for the WMA (bridging, dry culvert crossings, etc), and to coordinate minimization and mitigation effort with TWRA for their approval.

Impacts Evaluated Within 10,000 Ft of Study Area

AQUATIC SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** - No impact to the project is anticipated. There is no known occurrence of a rare, state, or federally-protected aquatic species within the project study area or corridor.

CAVES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated as there are no caves in the project study area or corridor.

EES Report

PIN 114147.00

4,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Terrestrial Species

Total= 12

	USESA	SPROT
Symplocarpus foetidus		E
Galium palustre		S
Oenothera parviflora		S
Corvus corax		T
Minuartia godfreyi		E
Dryopteris cristata		T
Hexastylis virginica		S
Cardamine rotundifolia		S
Dryopteris cristata		T
Cymophyllus fraserianus		S
Hydrophyllum virginianum		T
Scutellaria saxatilis		T

TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites — Total= **2**

- LAUREL CREEK TNC REGISTRY
- IRON MOUNTAIN

TDEC Scenic Waterways — None were found

Large Wetland Impacts

Total Acerage= 6.66

0.23	acres
0.16	acres
0.21	acres
0.36	acres
0.34	acres
0.16	acres
0.17	acres
0.55	acres
0.15	acres
0.20	acres
1.70	acres
0.16	acres
0.54	acres
0.43	acres
0.83	acres
0.21	acres
0.26	acres

PIN 114147.00

4,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Tennessee Natural Areas Program

None were found

Wildlife Management Areas

Total= 1

North Cherokee NF & WMA

EES Report

PIN 114147.00
2,000 Foot Corridor

Option: 114147_4602V01
Version Date: July 25, 2011
Created by: JONATHAN ROGERS

National Register Sites

Total= 1

Morrison Farm and Store

Superfund Sites

None were found

Pyritic Rock

Classification

Total= 4

May Contain Potentially Acid Producing Rock

Cranberry Granite

Unicoi Formation

Unicoi Formation

Unicoi Formation

TWRA Lakes & Other Public Lands

TWRA Lakes

None were found

Other Public Lands

Total= 1

North Cherokee NF

EES Report

PIN 114147.00

1,000 Foot Corridor

Option: 114147_4602V01

Version Date: July 25, 2011

Created by: JONATHAN ROGERS

Cemetery Sites & Cemetery Properties

Cemetery Sites — Total= 1

- Matron Cemetery

Cemetery Property — None were found

Institutions & Sensitive Community Populations

Institutions: — Total= 2

Church	State Line Church
Church	Bethel Church (Historical)

Populations:

No population present	Present
65 & older populations	None were found
Disability populations	None were found
Households without a vehicle	None were found
Minority populuations 24%	None were found
Linguistically isolated populations	Present
Populations below poverty-State average-13%	Present
Populations below poverty-State average-27%	None were found

Bat — None were found

Railroads — None were found

EES Report

PIN	114147.00	Option:	114147_4602V01
10,000 Foot Corridor		Version Date:	July 25, 2011
		Created by:	JONATHAN ROGERS

Aquatic Species	None were found
Caves	None were found

MEETING RECORDS

RPM Transportation Consultants, LLC
214 Centerview Drive, Suite 240 • Brentwood, TN 37027 • (615) 370-8410 • Fax (615) 370-8455

MEMORANDUM

TO: Mayor Larry Potter, Johnson County
Mayor Kevin Parsons, Town of Mountain City
Mayor Jack McCrady, Town of Damascus
Mark Reeter, Washington County Administrator
Donny Necessary, VDOT
Tony Jennings, Johnson County Highway Supt.
Chris Craig, First Tennessee Development District
Leigh Ann Tribble, FHWA
Frank Lege, Cherokee National Forest
Liz Smith, TDOT Conceptual and NEPA Planning
Paul Lane, TDOT Conceptual and NEPA Planning
Suzanne Herron, TDOT Environmental
Jeanne Stevens, TDOT Long Range Planning
Jessica Wilson, TDOT Long Range Planning
Paul Beebe, TDOT Region 1 Design
Nathan Vatter, TDOT Region 1 Traffic
Ronnie Walker, TDOT Region 1 Survey

FROM: Jeff Hammond, RPM Transportation Consultants

DATE: March 15, 2011

Subject: Stakeholder Field Review, March 31, 2011
State Route (SR) 91 Transportation Planning Report, Johnson County, TN, Washington County, VA

The Tennessee Department of Transportation (TDOT) will be holding an on-site field review to discuss the development of a Transportation Planning Report for SR 91 from Cold Springs Road in Johnson County, TN to US 58 in Washington County, VA. The field review will be held at 1:00 PM (ET) on Thursday, March 31 at the Johnson County Health Department located at 715 W. Main St in Mountain City, TN.

The field review will allow for information exchange between TDOT and local stakeholders at this early planning stage for this study. Input provided at this field review will assist in the development of the Transportation Planning Report, a study that will document the feasibility of improvement options for the SR 91 corridor.

Please contact Ms. Gena Gilliam (see contact below) to RSVP. If you have any questions prior to the field review, please contact either of the following:

Gena Gilliam, TDOT Project Manager
(615) 253-7692
gena.gilliam@tn.gov

Jeff Hammond, RPM (TDOT Consultant)
(615) 370-8410
jeffhammond@rpmtraffic.net

C: Gena Gilliam

TENNESSEE DEPT. OF TRANSPORTATION, PLANNING DIVISION
State Route 91 Transportation Planning Report
Stakeholder Field Review
Meeting Notes

March 31, 2011
1:00 PM – 2:30 PM

Meeting Purpose:
Provide an overview of the process, study limits and purpose of a Transportation Planning Report. Present data and information on existing conditions within the study area. Gather information and opinions from the stakeholders in order to assist in the development of the Transportation Planning Report.

Meeting Location:
Johnson County Health Department, 715 W. Main St., Mountain City, TN

Attendees:
See attached sign in sheet

Meeting Summary:
In general, materials presented and discussed included an overview of the Transportation Planning Report process, scope, and work progress to date. Further discussions involved development of the purpose and need of the study, environmental considerations associated with the Cherokee National Forest and Laurel Creek, coordination efforts between the Tennessee and Virginia Departments of Transportation, and proposals of alternative improvement options.

The following are key discussion/comment items from the meeting, organized into the major categories of Regional Project Coordination, Corridor Usage, and Purpose and Need:

<u>Regional Project Coordination</u>

- The study segment is entirely within unincorporated areas of Johnson County, TN and Washington County, VA. The study does not extend into either the Mountain City or the Damascus, VA city limits. However, an improved SR 91 route would benefit travel to and through these cities.
- Although some planning had occurred in past years for a bypass planned around Damascus, VA (approximately eight alternatives had been developed), no current bypass project exists.
- Currently, US 58 is under construction from VA 677 south of Abingdon to VA 638. This is Phase 1 of a three-phase project to widen US 58 to a four-lane highway between Abingdon and Damascus. Phase 2 is the segment of US 58 from VA 638 to VA 708. Preliminary engineering and right-of-way acquisition are complete for Phase 2 (UPC # 16383 in the VDOT Six-Year Improvement Program). Phase 3 is the segment of US 58 from VA 708 to the western city limit of Damascus. Preliminary engineering is complete for Phase 3 and right-of-way acquisition is underway (UPC # 16382 in the VDOT Six-Year Improvement Program). No construction funding has been allocated for either Phase 2 or Phase 3 in the current Six-Year Improvement Program.
- In Johnson County, a new SR 91 alignment around the west side of Mountain City is complete. The improved SR 91 route includes 8’ shoulders, truck climbing lanes, and turning lanes and has successfully diverted a significant volume of truck traffic off of the old SR 91 alignment. This diversion has:

    - Improved safety within the city limits
    - Lowered the cost of maintenance on the old SR 91 route
    - Provided a more efficient route for traffic which meets current design standards, and
    - Enhanced the residential and community context of the old SR 91 route.

- The 2003 Johnson County Transportation Plan recommends construction of a new alignment of SR 91 through Sugar Creek and reconnecting with the existing SR 91 prior to the Virginia State Line. This project is included as the sole short-term priority in the county plan.

Corridor Usage

- SR 91 is the primary connector between Mountain City and I-81. US 421 is another alternate route connecting Mountain City to I-81, but travel times using US 421 are significantly higher due to the low design speed of the mountainous route.
- The ADT on the southern end of the study corridor is approximately 3,800 vehicles per day. New traffic volumes have been obtained from VDOT show an ADT on the northern end of 2,400 vehicles per day.
- Coal, timber, and stone are some of the goods that are trafficked along SR 91. Truck traffic is significant, approximately 8 – 10% of all traffic.
- Johnson County residents frequently utilize the hospitals, businesses, and other services located in or surrounding Abingdon and use SR 91 to make this trip.
- Crash statistics show that SR 91 has a crash experience slightly above the statewide average, but not above the critical crash rate. Crash data supplied by VDOT shows a similar crash experience.

Purpose and Need

- A new alignment of the SR 91 corridor would not just improve in-state economic development but regional economic development, including Virginia and North Carolina. The concept of a regional economy (not limited within a single state's borders) is being cultivated within the region, and transportation infrastructure is a critical piece of this model.
- Improved access to I-81 is a special need for economic and business development in Johnson County.
- A significant percentage of the land area of Johnson County is designated as part of the Cherokee National Forest. Much of the existing SR 91 study area is within the National Forest. For this reason, access to lands for development is not a primary objective of corridor improvement.
- Watauga and Holston Lakes are tourist destinations within the vicinity of Mountain City. Access to these lakes is provided by SR 91.
- The Virginia Creeper Trail has resulted in significant economic development for Damascus and the region. An extension of the off-road, multi-use path is a plan that has been put in place by the Johnson County Trail Association. The plan involves ultimately constructing a trail that would connect the Creeper Trail to Mountain City and Watauga Lake. Constructing this connector trail on an existing, abandoned rail bed is proposed; a portion of the proposed trail alignment parallels the study segment along the west side of Laurel Creek.
- Improvement along the existing alignment would be difficult due to the proximity of Laurel Creek as well as the extreme topography adjacent to the creek.
- Roadway improvements should complement emerging economic development initiatives of Johnson County (for example, as a center for outdoor recreation activity).

- Given the need for a more modern connection to I-81 and the limitations of the existing SR 91, it is not expected that spot improvements to the existing route will effectively meet an established purpose and need for this study.

At the conclusion of the stakeholder meeting, a corridor site visit was made by Paul Lane (TDOT), Mayor Larry Potter (Johnson County), Jeff Hammond (RPM), and Blake Turner (RPM).

Stake Holder Attendees

STATE ROUTE 91 TRANSPORTATION PLANNING REPORT, JOHNSON COUNTY
STAKE HOLDER MEETING

Thursday, March 31, 2011, 1:00PM EST

Please Sign In:

Name	Organization	E-Mail & Phone
Freddy Phipps	County Comm.	FPhipps@mountainelectric.com
Lawrence C. Keeble	City Mayor	727 7928
Terry G. Reece	City Recorder	727 - 2816
DAVID YATES	Maymead	727-2000
Wiley Rork	Maymead	727. 2000 dyates@maymead.com
Donny Necessary	VDOT	276 669-9957 Donald.Necessary@VDOT.Virginia.gov
Steve Buston	Va. Dept of Transp.	steve.buston@vdot.virginia.gov
J. Poe	Jo. County mayor	727. 9694
Jim Moody	Johnson Co Hwy Dept	727-7851
Tony Jennings	Johnson Co. Hwy Dept	727-7851
Frank Lege	USFS	735-1500
Chris Craig	1st TN RPO First Tn Development District	ccraig@ftdd.org 423-722-5091
PAUL LANE	TDOT - PROJECT PLANNING	Paul.Lane@Tn.gov 615-253-2432
Jeff Hammond	RPM Transportation	jeffhammond@rpmtraffic.net
~~Blake Turner~~	RPM	~~blaketurner@rpmtraffic.net~~