STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
SUITE 1000, JAMES K. POLK BUILDING
505 Deaderick Street
NASHVILLE, TENNESSEE 37243-0344

Phil Bredesen
Governor

Gerald F. Nicely
Commissioner

MEMORANDUM

To: Don Ellis, Manager 2
Program Development and Scheduling Office

From: Bill Hart, Manager 2
Project Planning Division

Date: January 15, 2010

SUBJECT: Transportation Planning Report, PIN #112331.00 State Route 34 from Anderson Street to State Route 394, Bristol, Sullivan County

I am enclosing a copy of the subject report bearing the signatures of the appropriate Department personnel. In addition, a PDF file of the study will soon be available via PPRM and the Transportal.

This report is being provided for your use in determining priorities, establishing future scheduling, and initiating further development of the project.

If you need further information, please contact me.

BH/ gjg

Enclosure

CC/ enc: Steve Borden (Reg.1), Nathan Vatter (Reg. 1), Paul Beebe (Reg. 2), Ronnie Walker (Reg. 1), Mike Sparks (Bristol), David Metzger (Bristol), Rex Montgomery (Bristol MPO), Shari Brown (Bristol), Leigh Ann Tribble (FHWA)

CC: Ed Cole, Paul Degges, Doug Delaney, Chris Christianson, Jeff Jones, Ed Wasserman, Jim Moore, Jon Zirkle, Henry Pate, Jim Ozment, Steve Allen, Jeanne Stevens, Suzanne Herron, Mike Agnew, Mike Tugwell, Kelly Henshaw, Teresa Estes, Rusty Staggs, Liz Smith, Ralph Comer, Tom Love, David Thompson, Bob Allen, Lori Kirby, Joe Matlock, Terry Gladden, Angie Midget, Deborah Fleming, Terrance Hill

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EXECUTIVE SUMMARY

Jeffrey J. Broughton, City Manager of Bristol, TN, requested that the Tennessee Department of Transportation study State Route 34/US 421 from Anderson Street to the SR 394 intersection in Sullivan County, Tennessee. This study evaluated a 2.57-mile portion of SR 34/US 421 classified as an Urban Other Principal Arterial, from Anderson Street (L.M. 17.50) to the SR 394 intersection (L.M. 20.07).

The current *Bristol Urban Area Long-Range Transportation Plan Year 2030 Update*, adopted in 2008, includes this project as a needed improvement for widening as well as realignment of a portion of the roadway. The improvements are needed to address the following:

1. Replace the functionally obsolete section of SR 34 consisting of two 90-degree turns on Maple Street.
2. Reduce the rate of collisions resulting from left-turn movements.
3. Enhance the east-west linkage throughout the city.
4. Address a demand for improvements that has been documented for over 40 years.
5. Improve accessibility to schools and connect a growing residential area to jobs downtown and in the expanding industrial area while protecting the integrity of a historic neighborhood.
6. Improve pedestrian connectivity between residences and businesses. Connect to sidewalks in the Fairmount neighborhood, which are being improved by a federal Safe Routes to Schools grant. Provide bicycle accommodations on a portion of a planned bicycle route.
7. Address geometric deficiencies in lane width and provide shoulders.

The improvements include the addition of a two way left-turn lane (TWLTL), bicycle facilities and sidewalks. The MPO LRTP proposes reconstruction of the SR 34 corridor as a three-lane section identified as projects #1, 16 and 17.

The study corridor of SR 34 includes portions of Pennsylvania Avenue, Maple Street, and Virginia Avenue within the City of Bristol. Improvements to SR 34 are needed to improve the east and west connectivity within Bristol and enhance the transportation system linkages.

Five (5) options are evaluated for the SR 34 corridor. With the exception of the No-Build option, each build option is based on projects identified in the Bristol LRTP and involves widening and realignment of the two 90-degree turns at Maple Street to correct this existing roadway deficiency. If a build alternative is selected, the functional classification of SR 34 will likely remain an Urban Other Principal Arterial. However, Maple Street would no longer be part of SR 34 and maintenance for Maple Street would revert back to the City of Bristol. The new connection between Pennsylvania Avenue and Virginia Avenue would become part of the state system as SR 34.

Option 1 – No-Build

Option 1 proposes no improvements to the SR 34 study corridor other than routine maintenance. The existing corridor is generally anticipated to operate at a level of service (LOS) "C" or "D" for both the 2014 base year and 2034 design year. The only exception is the segment from Anderson Street to Maple Street that is projected to operate at LOS "E" in 2034.

Option 2 – Widen to 3 lanes and include a connection on Chesnut Street within 60' ROW

Option 2 involves widening the SR 34 corridor to provide two (2)12-feet wide lanes, one (1) TWLTL, 4-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 60-feet right-of-way, with easements where required. This option also includes shifting the SR 34 connection between Pennsylvania Avenue and Virginia Avenue from Maple Street south to Chesnut Street and improving the horizontal curve radii at these 90-degree turns. The projected cost of Option 2 is **$15.9** million dollars, and a Design Exception would be required.

Option 2A – Widen to 3 lanes and include a connection on Chesnut Street within 72' ROW

Option 2A involves widening the SR 34 corridor to provide two (2) 12-feet wide lanes, one (1) TWLTL, 6-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 72-feet right-of-way, with easements where required. This option also includes shifting the SR 34 connection between Pennsylvania Avenue and Virginia Avenue from Maple Street south to Chesnut Street and improving the horizontal curve radii at these 90-degree turns. The projected cost of Option 2A is **$17.7** million dollars, and a Design Exception would not be required.

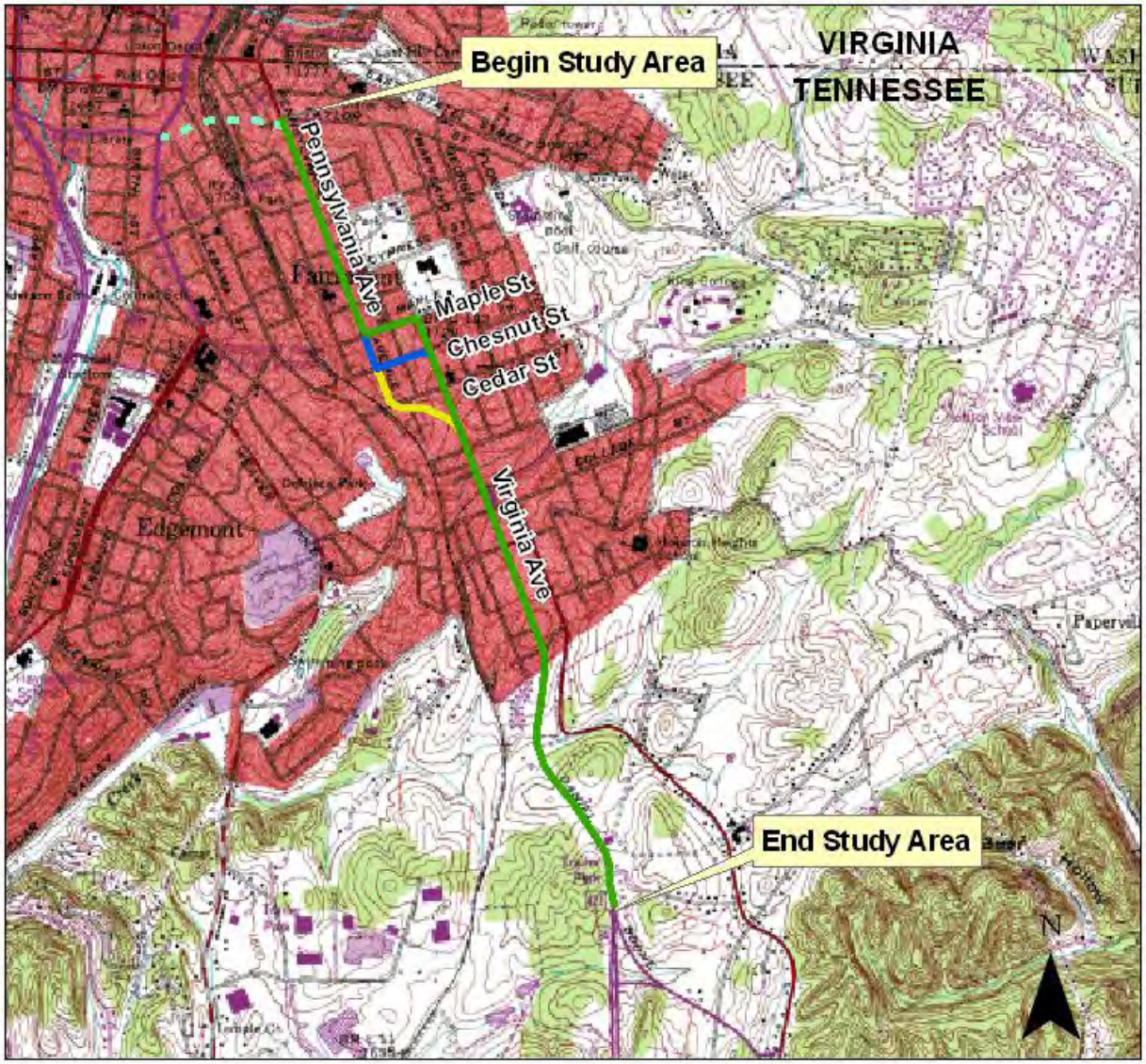
Option 3 – Widen to 3 lanes and include a connection on new location within 60' ROW

Option 3 involves widening the SR 34 corridor to provide two (2) 12-feet wide lanes, one (1) TWLTL, 4-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 60-feet right-of-way, with easements where required. This option also considers realigning the connection between Pennsylvania Avenue and Virginia Avenue. Option 3 proposes maintaining SR 34 along Pennsylvania Avenue southeast from the Maple Street intersection, crossing East Cedar Street near the Norfolk Southern Railway and connecting back into Virginia Avenue near Lakeview Street. This proposed new intersection with SR 34 and East Cedar Street would need to be signalized and coordinated with the railroad crossing signal gates. The projected cost of Option 3 is **$16.8** million dollars, and a Design Exception would be required.

Option 3A – Widen to 3 lanes and include a connection on new location within 72' ROW

Option 3A involves widening the SR 34 corridor to provide two (2) 12-feet wide lanes, one (1) TWLTL, 6-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 72-feet right-of-way, with easements where required. This option also considers realigning the connection between Pennsylvania Avenue and Virginia Avenue. Option 3A proposes maintaining SR 34 along Pennsylvania Avenue southeast from the Maple Street intersection, crossing East Cedar Street near the Norfolk Southern Railway and connecting back into Virginia Avenue near Lakeview Street. This proposed new intersection with SR 34 and East Cedar Street would need to be signalized and coordinated with the railroad crossing signal gates. The projected cost of Option 3A is **$17.7** million dollars, and a Design Exception would not be required.

BRISTOL, SULLIVAN COUNTY



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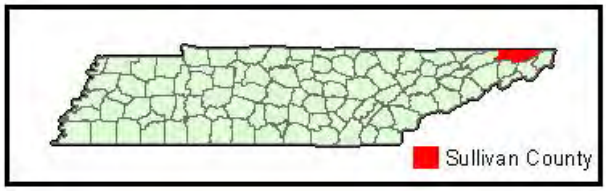

CORRIDOR MAP

- Anderson St
- Existing Route
- Option 2 and 2A
- Option 3 and 3A

TRANSPORTATION PLANNING REPORT

State Route 34

FROM ANDERSON STREET TO STATE ROUTE 394
BRISTOL, SULLIVAN COUNTY
PIN# 112331.00

PREPARED BY
PB AMERICAS, INC.
FOR THE
TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

Recommended by:	Signature	DATE
CHIEF OF ENVIRONMENT AND PLANNING	Ed Cole	1/14/10
TRANSPORTATION DIRECTOR PROJECT PLANNING DIVISION	Steve Allen	1-14-10
TRANSPORTATION MANAGER 2 PROJECT PLANNING DIVISION	Bill Hart	1/7/10

This document is covered by 23 USC § 409 and its production pursuant to fulfilling public planning requirements does not waive the provisions of § 409.

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PURPOSE OF THIS TRANSPORTATION PLANNING REPORT

Jeffrey J. Broughton, City Manager of Bristol, TN, requested the study of State Route 34 (SR 34)/US Highway 421 (US 421) from Anderson Street to the SR 394 intersection on November 13, 2008. The transition of SR 34/US 421 into Carl R. Moore Parkway begins immediately north of the SR 394 intersection. The current *Bristol Urban Area Long-Range Transportation Plan Year 2030 Update*, adopted in 2008, includes this project as a needed improvement for widening as well as realignment of a portion of the roadway to eliminate the two 90-degree turns. The improvements include the addition of shoulders, a two way left-turn lane (TWLTL), bicycle facilities and sidewalks.

The purpose of this report is to determine the immediate and long-term needs for improvement to SR 34/US 421 between Anderson Street and SR 394 Bristol, Sullivan County. The assessment process for this report involved the development of conceptual plans and planning level cost estimates for each improvement option.

HISTORY & BACKGROUND

SR 34 represents the portion of US 421 from the Virginia state line in downtown Bristol, to the North Carolina state line in the Cherokee National Forest, as shown in Figure 1. SR 34 is classified as an Urban Other Principal Arterial and follows a southeast-northwest alignment. This alignment is shown in the project location map in Figure 2. This study evaluated a 2.57-mile portion of SR 34/US 421, from Anderson Street (L.M. 17.50) to the SR 394 intersection (L.M. 20.07).

Proposed improvements to this portion of SR 34 date back several decades to the *1970 Land Use and Transportation Plan* for Sullivan County and the *1969 Long-Range Transportation Plan (LRTP)* compiled by the Tennessee and Virginia Departments of Transportation prior to the establishment of the Bristol Metropolitan Planning Organization (MPO). The Bristol MPO's long-range transportation plans, starting with the *Bristol Urban Area Major Thoroughfare Plan 1985-2005* adopted in 1986, likewise identify this corridor as a transportation modification project. The City of Bristol, Tennessee ("the City") identified the US 421 corridor, which includes this portion of SR 34, as an emphasis area for mobility and a priority for long-term economic growth in the locally adopted *Bristol, Tennessee Transportation and Land Use Study*.

The construction of the Bristol Bypass (SR 394) several years ago improved the southeastern access and connectivity of the study corridor. The realignment of SR 34 and construction of a new four-lane Anderson Street Bridge over the Norfolk Southern Railway main line from Edgemont Avenue to Pennsylvania Avenue improved the northwestern access and connectivity of the study corridor in 2008. From the downtown heart of Bristol at the Anderson Street Bridge, this corridor represents the shortest distance between downtown and the SR 394 bypass. The current MPO LRTP identifies the project in two phases. The first phase, from Anderson Street to Lakeview Street, would include realignment of the Maple Street "jog" that now transfers the SR 34 route from Virginia Avenue to Pennsylvania Avenue. The second phase would be the balance of the project south of Lakeview Street to the four-lane section just north of SR 394. The MPO LRTP proposes reconstruction of the SR 34 corridor as a three-lane section identified as projects #1, 16 and 17.

BRISTOL, SULLIVAN COUNTY

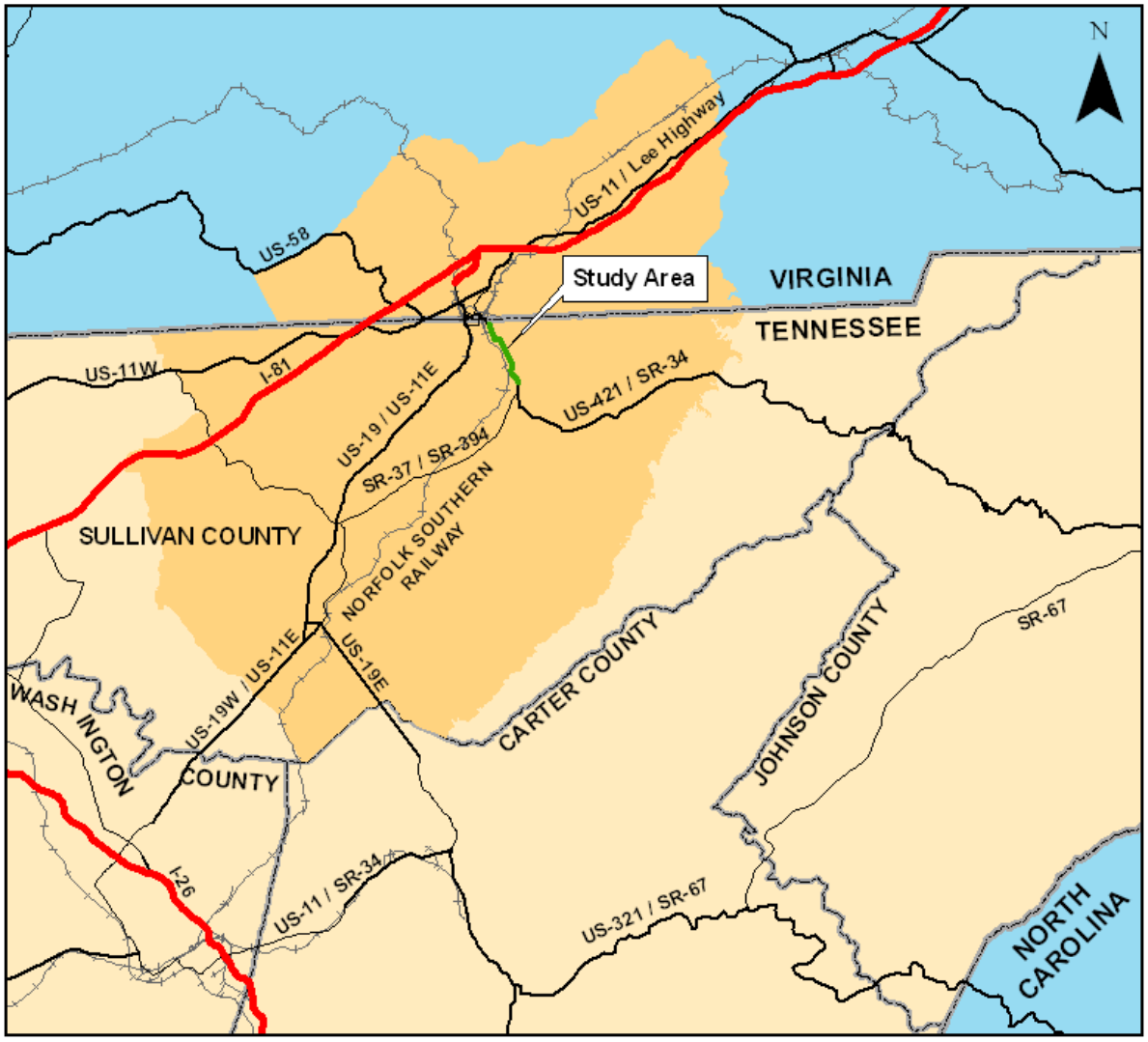
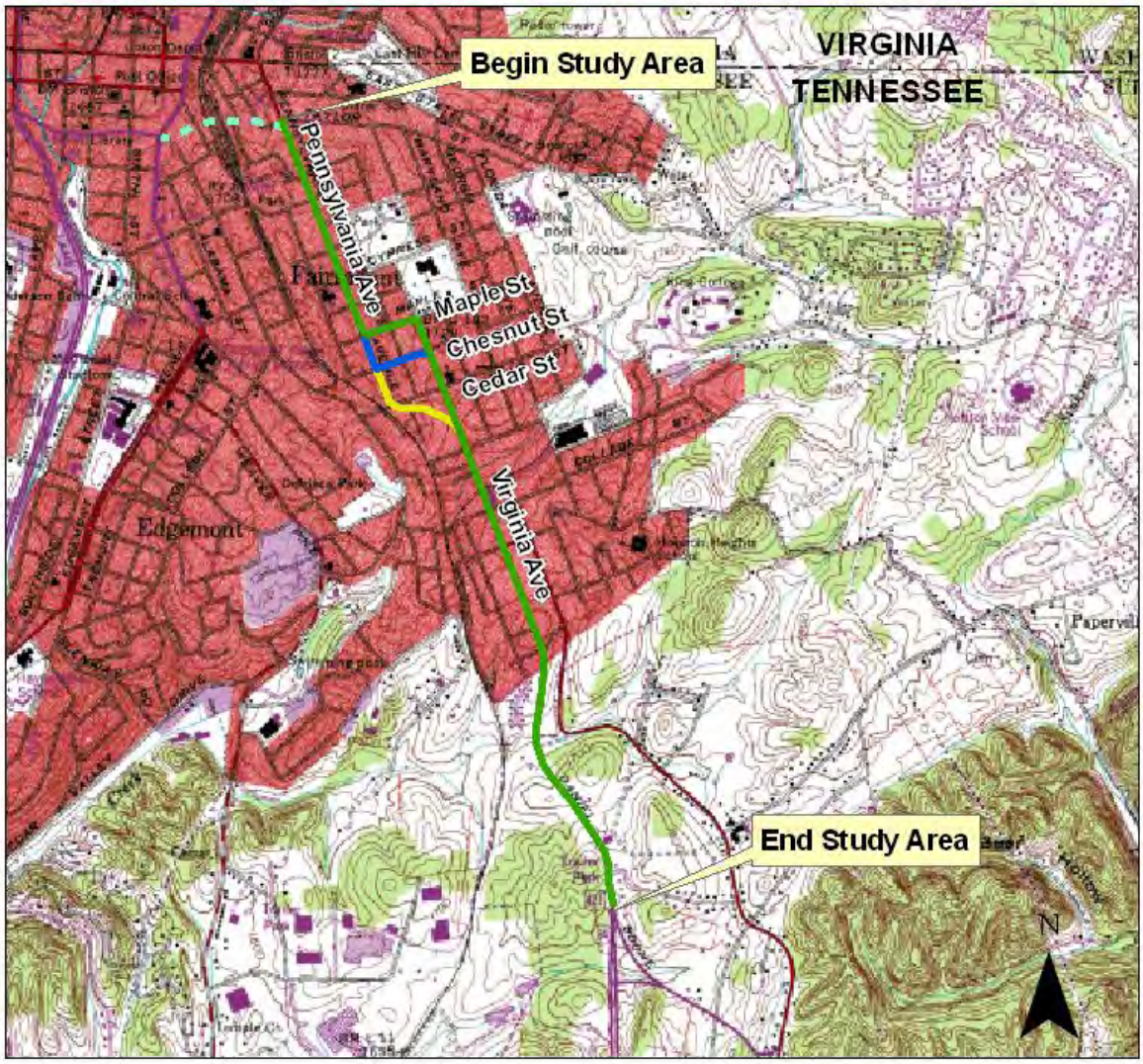


FIGURE 1
PROJECT VICINITY MAP

BRISTOL, SULLIVAN COUNTY



0 0.5 1 2 Miles

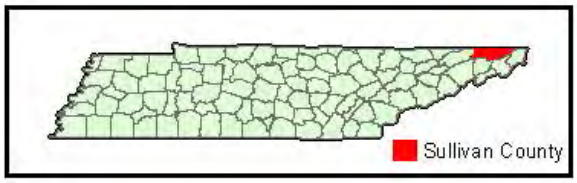


FIGURE 2
PROJECT LOCATION MAP

- Anderson St
- Existing Route
- Option 2 and 2A
- Option 3 and 3A

EXISTING CONDITIONS

Description of the Study Area

The study corridor of State Route (SR)-34 includes portions of Pennsylvania Avenue, Maple Street, and Virginia Avenue within the City of Bristol. The route is functionally classified as an Urban Other Principal Arterial on the State Highway system. This is the only portion of SR 34/US 421 with two travel lanes from the Virginia state line to the urban growth boundary. Partially discontinuous sidewalks facilitate pedestrian trips along one or both sides of SR 34 from Anderson Street to East Cedar Street. The corridor forms part of the Penn-Hickory bus route which provides hourly service between 6:15am and 5:15pm, five days a week.

The land use in the study area is primarily residential. Pockets of small commercial and office properties are located around the Food City grocery store at Lakeview Street and north of Anderson Street approaching downtown Bristol. The land use northwest of Hazelwood Street is classified as fringe with residential land use making up the balance of the corridor. An existing industrial area is located southwest of the study area, off SR 394 and Industrial Drive. Five churches own property adjacent to SR 34 and an additional church is located in the immediate study area. Fairmont Elementary school is within the study area and King College is less than half a mile to the east. Vance Middle School and Tennessee High School serve the entire city, including the residential neighborhoods in the study area. Land use and traffic generators in the vicinity of the study corridor are shown in Figure 3.

A mainline of the Norfolk Southern Railway runs parallel to SR 34 approximately 700 feet to the southwest and provides access to the industrial areas along SR 394. There are at-grade railroad crossings on East Cedar Street and Hazelwood Street, which close intermittently for rail traffic. More than twenty (20) trains go through Bristol on this Norfolk Southern mainline each day. There are bridge crossings over the railway line on Ash Street and Anderson Street. Industrial properties flank the railway line, but no sidings or intermodal access points serve these properties in the study area. The nearest airport is the Virginia Highlands Airport approximately ten (10) miles northeast of the study area.

In the corridor there are culvert crossings on three (3) branches of Cedar Creek, which is a 303(d)-listed impaired stream. One of these culverts is in a Federal Emergency Management Agency (FEMA) established 100-year flood zone. There is one (1) surface water body, classified PUBHh on the National Wetlands inventory, southwest of the Norfolk Southern Railway, located in Defriece Park and two (2), classified PEM1Ch and PEM1C, respectively, southwest of the study area. Figure 4 shows the location of these streams and wetlands identified in the National Wetlands Inventory. There are no such streams or wetlands identified for the northern portion of the project.

The highest population growth in the city is on the eastern side. SR 34 collects local traffic from these growing neighborhoods and distributes it for cross-town access at the intersections at Anderson Street, East Cedar Street, Hazelwood Street and the Bristol Bypass (SR 394).

Crash History

The City of Bristol, TN and TDOT provided crash data for this corridor. This data is included in the Appendix of this report. Safety related improvements were made to the intersections at Pennsylvania Avenue and Ash Street (2003, 2008), Kentucky Avenue and Maple Street (2002) and Virginia Avenue and East Cedar Street (2003). Crash data prior to these improvements were not included in the analysis of crashes at intersections.

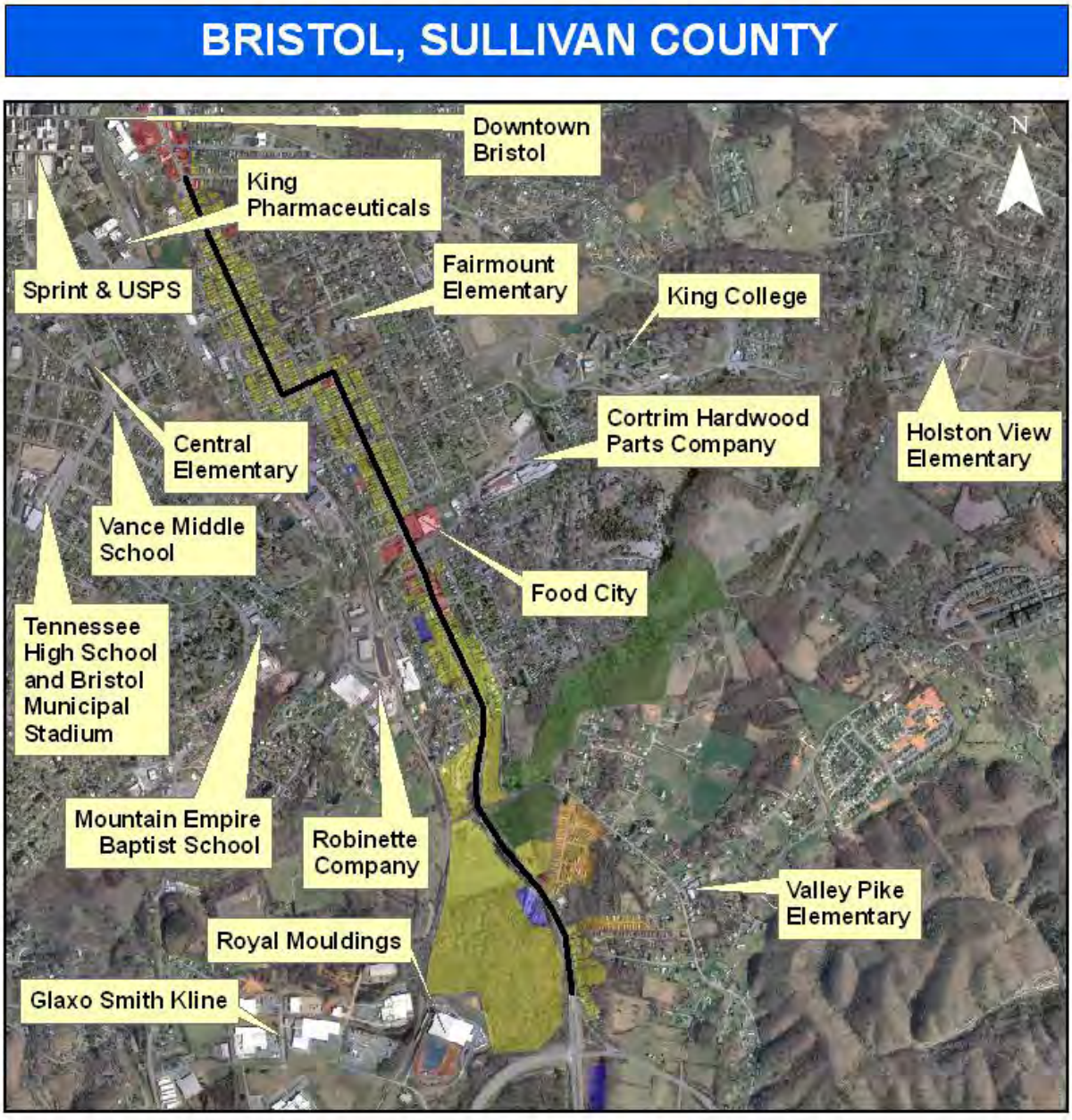
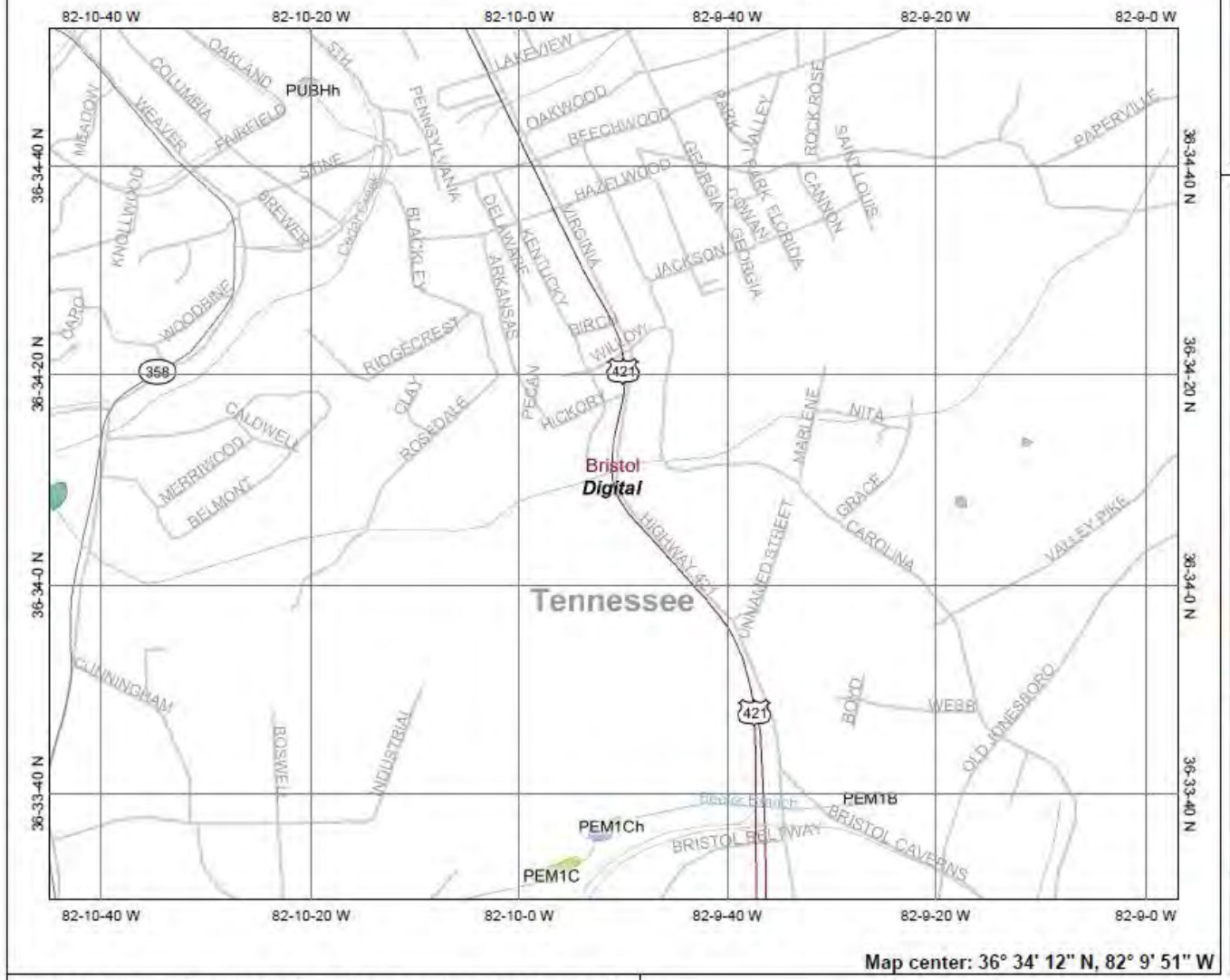
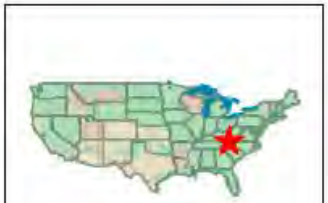


FIGURE 3
STUDY AREA LAND USE AND MORE REMOTE TRAFFIC GENERATORS

National Wetlands Inventory Map (Inset of Affected Area)



Map center: 36° 34' 12" N, 82° 9' 51" W



Legend

Ohio_wet_scan
- 0
- 1
- Out of range

Interstate

Major Roads
- Other Road
- Interstate
- State highway
- US highway

Roads

Cities

USGS Quad Index 24K

Lower 48 Wetland Polygons
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Historic Map Info

Lower 48 Available Wetland Data
- Non-Digital
- Digital
- No Data
- Scan

NHD Streams

Counties 100K

States 100K

South America

Scale: 1:18,000

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

FIGURE 4: WETLANDS AND STREAMS IN THE STUDY AREA

The most recent improvements at Pennsylvania Avenue and Ash Street replaced night time flash operation with 24-hour signal operation in November 2008. The Anderson Street Bridge altered traffic conditions in May 2008; no subsequent crashes were recorded at the intersection. In the period preceding the Anderson Street Bridge opening, the crash rate at this intersection was 1.34 per million entering vehicles (MEV), which exceeded the statewide average of 0.75 per MEV for this type of intersection.

Table 1 summarizes the most recent crash data for SR 34 provided by the City of Bristol. The table compares actual crash rates at the study corridor intersections to the statewide averages. The crash rate represents the number of crashes that occur annually at an intersection, per million vehicles entering the intersection. As this table shows, the crash rates at some intersections within the study area exceed their respective statewide average crash rates; however, the intersection crash analysis does not identify any significant safety concerns.

Table 1: Intersection Crash Summary

Location	Actual Crash Rate	Statewide Average Crash Rate
SR 34 (Pennsylvania Avenue) at Anderson Street (2008)[1]	1.83	0.83
SR 34 (Pennsylvania Avenue) at Ash Street (2008)[2]	NO DATA	0.75
SR 34 (Pennsylvania Avenue) at Maple Street (1999 – 2008)	0.53	0.19
SR 34 (Maple Street) at Kentucky Avenue (2002 – 2008)[3]	0.15	0.19
SR 34 (Virginia Avenue) at Maple Street (1999 – 2008)	0.33	0.19
SR 34 (Virginia Avenue) at East Cedar Street (2003 – 2008)[4]	1.39	0.91
SR 34 (Virginia Avenue) at Hazelwood Street (1999 – 2008)[5]	0.75	0.78

[1] After realignment and reopening subsequent to Anderson Street bridge construction 5-10-08
[2] Nighttime flash operation replaced by 24 hour signal operation 11-05-08
[3] Stop bars added on Kentucky Avenue approaches
[4] After back plates were fitted on East Cedar Street approaches
[5] After stop with flasher operation was replaced with full signal operation

Table 2 summarizes the crash data provided by TDOT, comparing the relevant crash rates on segments of SR 34/US 421 in the study area to the statewide average for the period 2005-2007. The crash rate represents the number of crashes that occur annually along a segment of roadway, per million vehicle miles traveled. As shown in Table 2, the crash rates on segments of SR 34 do not exceed the respective statewide average crash rates for a similar facility.

The segment crash analysis did not reveal any major safety concerns. However, it is notable that half the segment crashes were rear-end crashes, four (4) were angle crashes and three (3) more were sideswipe crashes. The proposed continuous TWLTL could potentially reduce these types of crashes.

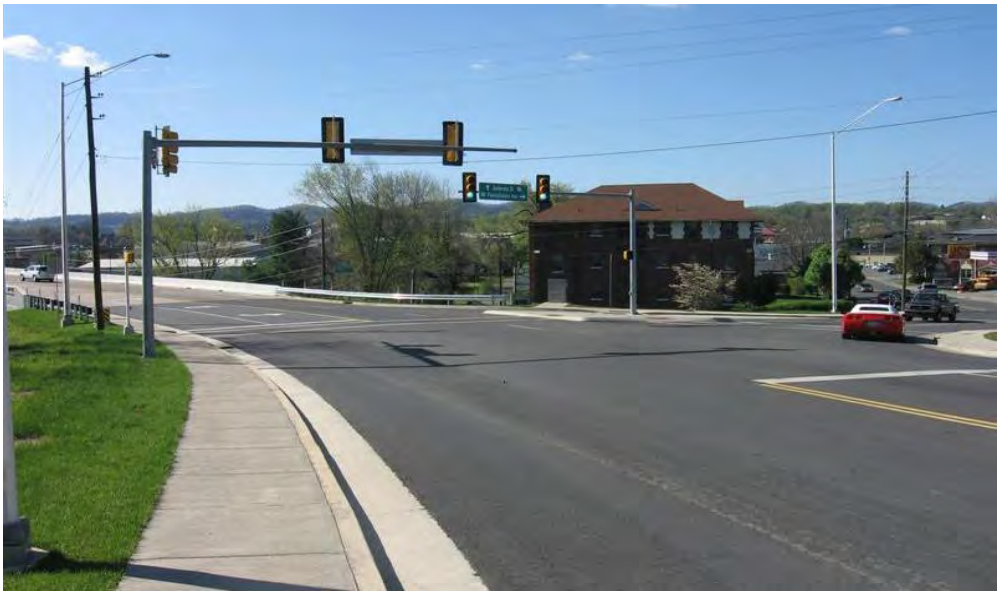
Table 2: Segment Crash Summary

From	To	Actual Crash Rate	Statewide Average Crash Rate
Anderson Street L.M. 17.50	Ash Street L.M. 17.70	0.84	2.39
Ash Street L.M. 17.70	Maple Street L.M. 18.08	0.17	2.39
Maple Street L.M. 18.08	Kentucky Avenue L.M. 18.15	0.00	2.39
Kentucky Avenue L.M. 18.15	Virginia Avenue L.M. 18.22	0.17	2.39
Virginia Avenue L.M. 18.22	East Cedar Street L.M. 18.41	0.33	2.39
East Cedar Street L.M. 18.41	Hazelwood Street L.M. 18.85	0.94	2.39
Hazelwood Street L.M. 18.85	Hickory Lane L.M. 19.19	0.59	2.39
Hickory Lane L.M. 19.19	Carl R. Moore Parkway L.M. 19.91	0.59	2.39

Geometrics

Along the study corridor, SR 34 is a two-lane Urban Other Principal Arterial and a Tennessee Scenic parkway. The terrain is classified as rolling. The lane widths along the corridor are 12-feet, except between Monte Vista Street (L.M. 18.65) and Willow Street (L.M. 19.14), where lanes are 11.5-feet wide. Right-of-way and shoulder widths, as well as grades, vary along the corridor and are described by segment.

<u>Anderson Street (L.M. 17.50) to Ash Street (L.M. 17.70)</u>



The intersection of Anderson Street and Pennsylvania Avenue is a signalized, three-leg intersection with the minor approach formed by the northward continuation of Pennsylvania Avenue. There are turn-lanes from SR 34 onto the minor Pennsylvania Avenue. The minor leg has a channelized right-turn (yield-controlled) to Anderson Street and a single left-turn lane to Pennsylvania Avenue. The right-of-way is 70-feet wide and there are 2-feet wide shoulders at the intersection. Immediately southeast of the intersection the right-of-way narrows to 54-feet and there are no shoulders for the remainder of the 1,050-feet long segment.

Ash Street (L.M. 17.70) to Maple Street (L.M. 18.08)

The intersection of Pennsylvania Avenue and Ash Street is a signalized, four-legged intersection with the minor approaches formed by Ash Street. There are no turn-lanes at this intersection. The right-of-way is 54-feet wide and there are no shoulders for the length of the 2,000-feet long segment.

Maple Street (L.M. 18.08) to Kentucky Avenue (L.M. 18.15)

The intersection of Pennsylvania Avenue and Maple Street is a stop-controlled, three-leg intersection with the minor approach formed by the southeastward continuation of Pennsylvania Avenue. Traffic negotiating the 90-degree turn from Pennsylvania Avenue to Maple Street, to remain on SR 34, does not stop. There are no turn-lanes at the intersection. The right-of-way is 62-feet wide and there are no shoulders for the length of the 370-feet long segment.

Kentucky Avenue (L.M. 18.15) to Virginia Avenue (L.M. 18.22)

The intersection of Maple Street and Kentucky Avenue is a stop-controlled, four-leg intersection with the minor approach formed by Kentucky Avenue. There are two 80-feet long left-turn lanes on the Kentucky Avenue approaches. SR 34 traffic does not stop at the intersection and there are no turn-lanes. The right-of-way is 62-feet wide and there are no shoulders for the length of the 370-feet long segment.

Virginia Avenue (L.M. 18.22) to East Cedar Street (L.M. 18.41)

The intersection of Maple Street and Virginia Avenue is a stop-controlled, four-leg intersection with the minor approaches formed by the northeastward continuation of Maple Street and the northwestward Virginia Avenue approach. Traffic negotiating the 90-degree turn from Maple Street to Virginia Avenue does not stop. The right-of-way is 62-feet wide and there are no shoulders for the length of the 1,000-feet long segment.

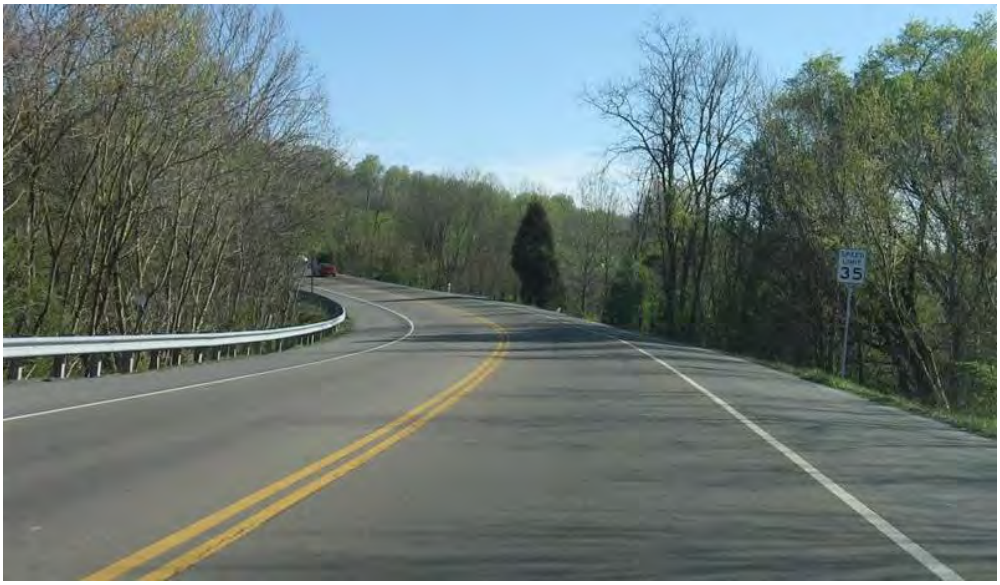
East Cedar Street (L.M. 18.41) to Hazelwood Street (L.M. 18.85)

The intersection of Virginia Avenue and East Cedar Street is a signalized, four-leg intersection with the minor approaches formed by East Cedar Street. The northeast-bound East Cedar Street approach has a 150-feet long right-turn lane. The right-of-way is 62-feet wide to the intersection with Monte Vista Street (L.M. 18.65) and 44-feet wide for the balance of the 2,325-feet long segment. There are 5-feet wide shoulders from Monte Vista Street to the end of the segment.

Hazelwood Street (L.M. 18.85) to Hickory Lane (L.M. 19.19)

The intersection of Virginia Avenue and Hazelwood Street is a stop controlled, four-leg intersection with the minor approaches formed by Hazelwood Street. The southeast-bound Virginia Avenue approach has a 90-feet long left-turn lane and the northwest-bound Virginia Avenue approach has a 60-feet long left-turn lane. The right-of-way is 44-feet wide to the end of the turn-lane transition (L.M. 18.90) and 60-feet wide for the balance of the 1,800-feet long segment. There is a 10-feet wide left and 14-feet wide right shoulder, respectively, from L.M. 18.90 to Willow Street (L.M. 19.14) and 8-feet wide left and right shoulders to the end of the segment. On-street parking is permitted along this section that includes the Bristol Housing Authority residential units.

Hickory Lane (L.M. 19.19) to Carl R. Moore Parkway (L.M. 19.91)



The intersection of Virginia Avenue and Hickory Lane is a stop controlled, three-leg intersection with Hickory Lane forming the minor approach. SR 34 traffic does not stop at the intersection and there are no turn-lanes. The right-of-way is 60-feet wide and there are 8-feet wide left and right shoulders from Hickory Lane to where SR 34 becomes the four-lane section of Carl R. Moore Parkway (L.M. 19.85). Through the transition, the right-of-way is 150-feet and the section widens to include 14-feet wide shoulders, 12-feet wide lanes and a 16-feet wide painted median at its widest point at L.M. 19.91.

Major Structures

There are concrete culvert crossings of three branches of Cedar Creek at L.M. 18.68, L.M. 19.42 and L.M. 20.02, respectively along SR 34.

Multi-Modal Facilities

There are no existing dedicated bicycle facilities along the corridor. However, the existing wide shoulders along SR 34 from Monte Vista Street (L.M. 18.65) transitioning to SR 34/US 421 (Carl R. Moore Parkway) (L.M. 19.91), though unsigned, can accommodate bicycle traffic.

Pennsylvania Avenue Sidewalk Example

Sidewalks are present on one or both sides of the road from Anderson Street (L.M. 17.50) to East Cedar Street (L.M. 18.41), except along Maple Street (L.M. 18.08 – L.M. 18.22). Short segments of sidewalk are also located along Virginia Avenue (SR 34) between Hazelwood Street and Hickory Lane adjacent to the Bristol Housing Authority property. The sidewalks vary in width between four (4) and five (5) feet and include a wide grass strip separating the sidewalks from the travel lanes along many of the older segments of the corridor. The sidewalks are generally in a poor condition and do not meet Americans with Disabilities Act (ADA) standards.

Bus service is provided along the corridor by the Bristol TN Transit System. The corridor forms part of the Penn-Hickory bus route which provides hourly service between 6:15am and 5:15pm, five (5) days a week. Two (2) stops within this route are made along the study area of the existing SR 34 corridor: the Virginia Ave at Beechwood intersection and at Food City along Virginia Ave. There are no existing bus pull-offs at these locations and no bus stops are listed within the existing section of SR 34 that would be abandoned. Citywide demand response paratransit service and job access transportation are also available.

CAPACITY ANALYSES

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 3 shows the traffic flow conditions and appropriate driver comfort level at each level of service.

Table 3: Description of Levels of Service

LOS	Traffic Flow Conditions
A	Free flow operations. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream. The general level of physical and psychological comfort provided to the driver is high.
B	Reasonably free flow operations. The ability to maneuver within the traffic stream is only slightly restricted and the general level of physical and psychological comfort provided to the driver is still high.
C	Flow with speeds at or near free flow speeds. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more vigilance on the part of the driver. The driver notices an increase in tension because of the additional vigilance required for safe operation.
D	Speeds decline with increasing traffic. Freedom to maneuver within the traffic stream is more noticeably limited. The driver experiences reduced physical and psychological comfort levels.
E	At lower boundary, the facility is at capacity. Operations are volatile because there are virtually no gaps in the traffic stream. There is little room or no 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 or no room to maneuver. The driver experiences poor levels of physical and psychological comfort.

Class I highways typically include higher speed arterials and daily commuter routes while Class II highways include lower speed collector roadways and roads primarily designed to provide access. Since SR 34 has a high intersection density and serves various land uses, the corridor was assumed to be a Class II highway for this analysis. Levels of service for Class II highways are based on the percentage of time vehicles spend following other vehicles. The percentages and corresponding LOS is shown in Table 4.

Table 4: LOS Criteria for Class II Two-Lane Highways

LOS	Percent Time Spent Following
A	≤ 40
B	> 40 – 55
C	> 55 – 70
D	> 70 – 85
E	≥ 85

Note: LOS F applies whenever the flow rate exceeds the segment capacity.

Two scenarios used in travel demand modeling performed by TDOT apply to this corridor. TDOT traffic projections for both a 2014 base year and 2034 design year were analyzed for each segment of the existing SR 34 corridor geometry. The majority of segments are projected to operate at a LOS “C” or “D” with the exception of the 2034 segment from Anderson Street to Maple Street that operates at LOS “E.” Table 5 presents projected Design Hourly Volumes (DHV’s) for each road segment for both 2014 and 2034, as well as the corresponding LOS for each segment.

Table 5: DHV by Roadway Segment

	2014		2034	
Location	**DHV**	**LOS**	**DHV**	**LOS**
Anderson Street to Maple Street (L.M. 17.85)	1,674	D	2,010	E
Pennsylvania Avenue to Virginia Avenue (L.M. 18.20)	1,176	D	1,411	D
Maple Street to East Cedar Street (L.M. 18.30)	714	C	857	C
East Cedar Street to Hazelwood Street (L.M. 18.60)	564	C	677	C
Hazelwood Street to SR 394 (L.M. 19.50)	1,284	D	1,541	D
East Cedar Street (Pennsylvania Ave to Virginia Ave)	630	C	756	C

FIELD REVIEW INFORMATION

The field review for SR 34 was held on April 16, 2009. The Appendix contains a list of attendees and minutes from the field review. As noted in the minutes, attendees reviewed potential locations for the realignment of the Maple Street segment (L.M. 18.08 – L.M. 18.20) of SR 34. The existing 90 degree turns at Maple Street (L.M 18.08 and L.M. 18.22) were discussed to improve the horizontal alignment of the direct connection along SR 34 between Pennsylvania Avenue and Virginia Avenue. Improvements to the curve radii at the existing Maple Street segment of SR 34 were determined to be undesirable due to the proximity of historical properties at that intersection. Due to the potential impacts to historical properties, other connections on new location and intersecting streets along Pennsylvania Avenue were reviewed.

Right-of-way discrepancies between the Tennessee Roadway Information Management System (TRIMS) and local subdivision plats were noted at the field review. TDOT right-of-way widths from TRIMS are used for the purpose of this study while a detailed survey will be necessary for design. Due to field observations indicating limited existing ROW and the presence of both overhead and underground utilities, the determination was made to consider both a standard TDOT 3-lane typical section within 72’ ROW and a compressed 3-lane typical section within 60’ ROW. The intent of the 60’ ROW section is to attempt to minimize costly utility relocations and impacts to the properties along SR 34.

Thus, five (5) options were discussed for assessment in this study. These include “No-Build”, Option 2 - Widen to 3 lanes and include a connection on Chesnut Street within 60’ ROW, Option 2A – Widen to 3 lanes and include a connection on Chesnut Street within 72’ ROW, Option 3 – Widen to 3 lanes and include a connection on new location within 60’ ROW, and Option 3A – Widen to 3 lanes and include a connection on new location within 72’ ROW.

Design Exceptions would be required for Option 2 and Option 3 because of the proposed 60’ of ROW.

PURPOSE & NEED FOR IMPROVEMENTS

Safety

Crash rates on road segments in the corridor did not exceed the statewide average. Of the twenty-six (26) crashes which did not occur at intersections during the period from 2005 to

2007, approximately half were rear-end collisions and another quarter were angle or side-swipe collisions. The addition of a TWLTL and providing shoulders wider than four (4) feet has been shown to reduce these crash types on roadway segments.

System Linkage

The proposed thoroughfare is a major connector from southeastern Bristol to northwestern Bristol. From the Virginia state line to the northwestern limit of the study area, SR 34/US 421 is a four-lane section divided by a median or TWLTL. Southeast of the study area, SR 34/US 421 is a four-lane median divided section to the urban growth boundary. The two-lane section of SR 34/-US 421 through the study corridor, with a speed limit of 25 mph between Anderson Street (L.M. 17.50) and Hickory Lane (L.M. 19.19) creates a bottleneck for regional traffic between Interstate 81 north of Bristol and the northern Cherokee National Forest Wildlife Management Area (WMA), which relies on SR 34/US 421 for the most direct link between the facilities at South Holston Lake and the interstate.

In addition to serving as a major connector to areas east of Bristol, SR 34/US 421 constitutes the only east-west state route through the northern portion of Bristol, which is bisected by the Norfolk Southern Railway main line. Traffic from the eastern side of Bristol, which has experienced the highest population growth of any area in the city, is distributed from local streets and collectors to the study corridor of SR 34. Major intersections at Anderson Street, East Cedar Street, Hazelwood Street, and Bristol Caverns Highway (SR 435) serve to distribute local traffic between SR 34 and these high-growth areas.

The SR 34 study corridor represents the shortest distance from the downtown heart of Bristol at the Anderson Street Bridge to the SR 394 Bypass. With the continued development of a regional industrial park adjacent to SR 394, known as Partnership Park II, and continued growth of the existing industries in this area, connectivity between downtown and this new commercial and industrial area takes on additional significance. Additionally, the terrain of Bristol consists of several parallel ridge-and-valley formations that severely limit the ability of thoroughfare traffic to move east and west through Bristol to only a few streets (West State Street on the state line, Windsor Avenue in Tennessee and Euclid Avenue in Virginia). Thus, improvements to SR 34 are needed to improve the east and west connectivity within Bristol and enhance the transportation system linkages.

Capacity

Existing annual average daily traffic (AADT) volumes along the SR 34/US 421 study corridor range from 4,475 vehicles per day on Maple Street to 8,580 vehicles per day near the SR 394 intersection. Capacity constraints are introduced along the corridor primarily at the signalized intersections (Pennsylvania Avenue and Ash Street; Virginia Avenue and East Cedar Street). The current Bristol Long-Range Transportation Plan predicts the highest volume-to-capacity (V/C) ratio, without modifications to the corridor, is 0.85 in 2030 for the two-lane portion of SR 34 just north of SR 394. The (V/C) ratio, also referred to as degree of saturation, represents the sufficiency of an intersection to accommodate the vehicular demand. A (V/C) ratio less than 0.85 generally indicates that adequate capacity is available and vehicles are not expected to experience significant queues and delays.

The capacity analyses for the TDOT traffic projections of a 2014 base year and 2034 design year indicate the study corridor segments operate at a LOS “C” or “D”. The only exception is the segment from Anderson Street to Maple Street that is projected to operate at LOS “E” in 2034.

Legislation

The current Bristol MPO Long-Range Transportation Plan proposes reconstruction of the SR 34 corridor as a three-lane section identified as projects #1, 16 and 17. No specific state or federal legislation mandates improvements to SR 34/US 421.

Social Demands or Economic Development

The immediate study area is primarily residential, with some pockets of multi-family housing, commercial development and some industrial development in the vicinity. The "Fairmount" area is currently being evaluated for designation as the "Fairmount Neighborhood National Register Historic District." The boundaries for this proposed historic district include Pennsylvania Avenue and Maple Street. The City adopted the *Transportation and Land Use Study* and *Future Land Use Plan* in 2006 to guide future development. The land use plan recognizes that the preservation of the historic value and stability of the original Fairmount neighborhood is a community priority.

This corridor is an important connection between downtown Bristol, residential neighborhoods and the growing employment areas to the south. The area north and east of the intersection of SR 34/US 421 and SR 394 is identified in the land use plan as a primary area for future residential growth. Virginia Avenue, between East Cedar Street and Hazelwood Street, will continue to provide a general commercial corridor with higher density residential development south of this area. The higher density residential area includes Bristol Housing Authority residential units.

In 2005, the Louis Berger Group and the University of Tennessee developed future 2030 population and employment projections for the Bristol MPO. The projections indicated 43 percent of the future residential growth for Bristol will occur in east Bristol. In addition to current economic development trends, future commercial and industrial growth will continue to be located along and between SR 34 and SR 394. By 2030, the SR 394 corridor is expected to support approximately 60 percent of the future basic employment growth. The SR 34/US 421 corridor is thus a priority for long-term economic growth for the City of Bristol.

Demographically, the City of Bristol is indicative of the socio-economic trends for Sullivan County and the Tri-Cities Region. The study area includes an estimated population of approximately 8,500 or 35 percent of the community. This population can be further characterized as 5.8 percent minority and a median age of 39.7 years. Citywide, the minority population represents 4.2 percent of the population; the median age is 39.9 years of age; and 76 percent of Bristol's population are high school graduates or higher. The civilian labor force for Sullivan County is 73,530 persons, with an unemployment rate of 4.1 percent (March 2008).

For project level corridor analysis, smaller scale spatial data is required. The EPA Environmental Justice assessment tool was utilized to identify any potential concerns with the SR 34 study corridor. No disproportionately high and adverse effects on low-income populations, minority populations and Limited English Proficiency (LEP) populations were revealed. The minority populations represent less than 10 percent of the total population; poverty status ranged from 10 to 30 percent of the total population and 1 to 2 percent of the total population speak English less than well.

This corridor is important for distributing school and college trips. A new elementary school, serving 600 students, is scheduled to open on Cypress Street in the center of the Fairmount neighborhood in January 2010. This new school will expand the previous Fairmount Elementary at the same location. The school will serve District 5, which reaches from Hazelwood Street to the state line, and is bounded by Florida Avenue in the east and 12th Street in the west. Vance Middle School and Tennessee High School serve the entire City of Bristol.

These schools are located west of the Norfolk Southern Railway main line. East Cedar Street is a primary access corridor to the growing King College, immediately east of the study area.

Modal Interrelationships

Bristol Tennessee Transit operates the Penn-Hickory service along the SR 34 corridor between Industrial Drive, SR 394, King College and downtown Bristol. Citywide demand response paratransit service and job access transportation are also provided. Improvements to transit service could include bus pull-offs and bus shelters with appropriate public input and demand.

The *Bristol Tennessee Bicycle and Pedestrian Plan* includes the portion of the SR 34 corridor from Beechwood Drive to SR 394 as part of the proposed Southeast Bicycle Route. The overall proposed route will cover almost ten (10) miles from US 11E at SR 394 to the state line at Georgia Avenue and connect to the balance of the future bicycle network.

Sidewalks are present in the residential areas along Pennsylvania Avenue, Maple Street and Virginia Avenue. Sidewalks are intermittent along the commercial sections of southern Virginia Avenue. Anticipating an increase of traffic to the reopened Fairmount Elementary School, the city applied for and was awarded a federal grant to improve sidewalk connectivity to the school in the Fairmount neighborhood. The Safe Routes to School grant will also provide educational programs to encourage walking to school. The deficient conditions of existing sidewalks along the SR 34 corridor are due to either disrepair or discontinuous sections along many portions of Pennsylvania Avenue, Virginia Avenue and Maple Street.

The Norfolk and Southern Railway main line runs parallel to the SR 34 study corridor and serves individual industrial properties along SR 394. There are two (2) railroad at-grade crossings on East Cedar Street (L.M. 18.41) and Hazelwood Street (L.M. 18.85).

Roadway Deficiencies

The most visible operational issues along the SR 34 study corridor are the two (2) 90-degree turns at Maple Street. Both of these intersections operate with the SR 34 approaches (non-collinear) as the through movement. Thus, for each four-legged intersection, the two (2) local street approaches are controlled with STOP signs, one (1) SR 34 approach is controlled with a YIELD sign, and the other SR 34 approach operates as a free-flow movement. A traffic signal at Virginia Avenue and Maple Street was removed by the City of Bristol in 1995 to improve operations at this location.

Due to the 90-degree turns along SR 34 at both ends of Maple Street, this section of the study corridor represents a functionally obsolete section of this route. The two (2) 90-degree turns provide insufficient horizontal curve radii for the posted speed limit of 25 mph. The minimum horizontal curve radius for a 25 mph design speed is approximately 154-feet. The proposed realignment of this portion of the corridor would provide sufficient horizontal curvature for a design speed of 35 mph.

Current geometric design standards require 12-feet wide travel lanes. From the intersection of Monte Vista Street (L.M. 18.65) to Willow Street (L.M. 19.14), lane widths are 11.5-feet. There are no shoulders from Anderson Street (L.M. 17.50) to Monte Vista Street (L.M. 18.65).

OPTIONS FOR IMPROVEMENT

Five (5) options are evaluated for the SR 34 corridor. With the exception of the No-Build option, each option is based on the projects identified in the Bristol LRTP and involves widening to three (3) lanes and realignment of the two (2) 90-degree turns at Maple Street. The determination was made to consider both a standard TDOT 3-lane typical section within 72' ROW and a compressed 3-lane typical section within 60' ROW. The intent of the 60' ROW section is to attempt to minimize costly utility relocations and historical impacts to the properties along SR 34. Design Exceptions would be required for the 60' ROW options. The costs were estimated using 2008 Tennessee statewide averages.

Detailed descriptions of the following options are presented in this section:

- Option 1 – No-Build
- Option 2 – Widen to 3 lanes and include a connection on Chesnut Street within 60' ROW
- Option 2A – Widen to 3 lanes and include a Chesnut Street connection within 72' ROW
- Option 3 – Widen to 3 lanes and include a connection on new location within 60' ROW
- Option 3A – Widen to 3 lanes and include a connection on new location within 72' ROW

Option 1 – No-Build

Option 1 proposes no improvements to the SR 34 study corridor other than routine maintenance. The impacts of this option serve as the basis for comparison with the various improvements and build options for SR 34. The capacity analyses shown in Table 5 for SR 34 under this No-Build scenario indicate the existing corridor is anticipated to operate at a level of service (LOS) "C" or "D" for both the 2014 base year and 2034 design year. The only exception is the segment from Anderson Street to Maple Street that is projected to operate at LOS "E" in 2034.

Option 2 – Widen to 3 lanes and include a connection on Chesnut Street within 60' ROW

Option 2 involves widening the SR 34 corridor to provide two (2) 12-feet wide travel lanes, one (1) TWLTL, 4-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 60-feet ROW, with easements where required. This option also includes shifting the SR 34 connection between Pennsylvania Avenue and Virginia Avenue from Maple Street south to Chesnut Street (L.M. 18.30) and improving the horizontal curve radii at these 90-degree turns. There is an existing vertical crest along Chesnut Street at Kentucky Avenue. Reducing an existing sag curve and accommodating the horizontal curve from Chesnut Street to Virginia Avenue will require substantial fill. The overall roadway length of the SR 34 corridor incorporating Option 2 would be 2.54 miles. The abandonment of Maple Street and the more direct Chesnut Street connection result in a 0.03 mile net reduction to SR 34 and the State Highway System. Table 6 presents the summary of costs for Option 2.

Table 6: Summary of Costs for Option 2

Item	Cost Estimate
Construction	$5,333,200
Utilities	$1,647,900
Preliminary Engineering (10%)	$864,500
Right-of-Way Acquisition	$317,000
Inflation (10% per year for 5 years)	$5,999,177
Total	**$15,825,677**

Option 2A – Widen to 3 lanes and include a connection on Chesnut Street within 72' ROW

Option 2A involves widening the SR 34 corridor to provide two (2) 12-feet wide travel lanes, one (1) TWLTL, 6-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 72-feet right-of-way, with easements where required. This option also includes shifting the SR 34 connection between Pennsylvania Avenue and Virginia Avenue from Maple Street south to Chesnut Street (L.M. 18.30) and improving the horizontal curve radii at these 90-degree turns. There is an existing vertical crest along Chesnut Street at Kentucky Avenue. Reducing an existing sag curve and accommodating the horizontal curve from Chesnut Street to Virginia Avenue will require substantial fill. The overall roadway length of the SR 34 corridor incorporating Option 2A would be 2.54 miles. The abandonment of Maple Street and the more direct Chesnut Street connection result in a 0.03 mile net reduction to SR 34 and the State Highway System. Table 7 presents the summary of costs for Option 2A.

Table 7: Summary of Costs for Option 2A

Item	Cost Estimate
Construction	$7,784,885
Utilities	$1,859,100
Preliminary Engineering (10%)	$964,399
Right-of-Way Acquisition	$354,000
Inflation (10% per year for 5 years)	$6,692,645
Total	**$17,655,028**

Option 3 – Widen to 3 lanes and include a connection on new location within 60' ROW

Option 3 involves widening the SR 34 corridor to provide two (2) 12-feet wide travel lanes, one (1) TWLTL, 4-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 60-feet right-of-way, with easements where required. This option also considers realigning the connection between Pennsylvania Avenue and Virginia Avenue. Option 3 proposes maintaining SR 34 along Pennsylvania Avenue southeast from the Maple

Street intersection (L.M. 18.08), crossing East Cedar Street near the 200' Norfolk Southern Railway right-of-way and connecting back into Virginia Avenue near Lakeview Street (L.M. 18.58). The overall roadway length of the SR 34 corridor incorporating Option 3 would be 2.53 miles. The abandonment of Maple Street and the more direct connection on new location result in a 0.04 mile net reduction to SR 34 and the State Highway System. Table 8 presents the summary of costs for Option 3.

Table 8: Summary of Costs for Option 3

Item	Cost Estimate
Construction	$5,467,300
Utilities	$1,786,800
Preliminary Engineering (10%)	$896,370
Right-of-Way Acquisition	$576,000
Inflation (10% per year for 5 years)	$6,371,325
Total	**$16,807,395**

Option 3A – Widen to 3 lanes and include a connection on new location within 72' ROW

Option 3A involves widening the SR 34 corridor to provide two (2) 12-feet wide travel lanes, one (1) TWLTL, 6-feet shoulders which will also serve as bicycle accommodations and 5-feet sidewalks within a 72-feet right-of-way, with easements where required. This option also considers realigning the connection between Pennsylvania Avenue and Virginia Avenue. Option 3A proposes maintaining SR 34 along Pennsylvania Avenue southeast from the Maple Street intersection (L.M. 18.08), crossing East Cedar Street near the 200' Norfolk Southern Railway right-of-way and connecting back into Virginia Avenue near Lakeview Street (L.M. 18.58). The overall roadway length of the SR 34 corridor incorporating Option 3A would be 2.53 miles. The abandonment of Maple Street and the more direct connection on new location result in a 0.04 mile net reduction to SR 34 and the State Highway System. Table 9 presents the summary of costs for Option 3A.

Table 9: Summary of Costs for Option 3A

Item	Cost Estimate
Construction	$7,398,385
Utilities	$1,998,000
Preliminary Engineering (10%)	$939,639
Right-of-Way Acquisition	$622,000
Inflation (10% per year for 5 years)	$6,689,983
Total	**$17,648,006**

The active and heavily used rail line causes regular delays at the at-grade railroad crossing on East Cedar Street. More than twenty (20) trains per day go through Bristol. Members of the

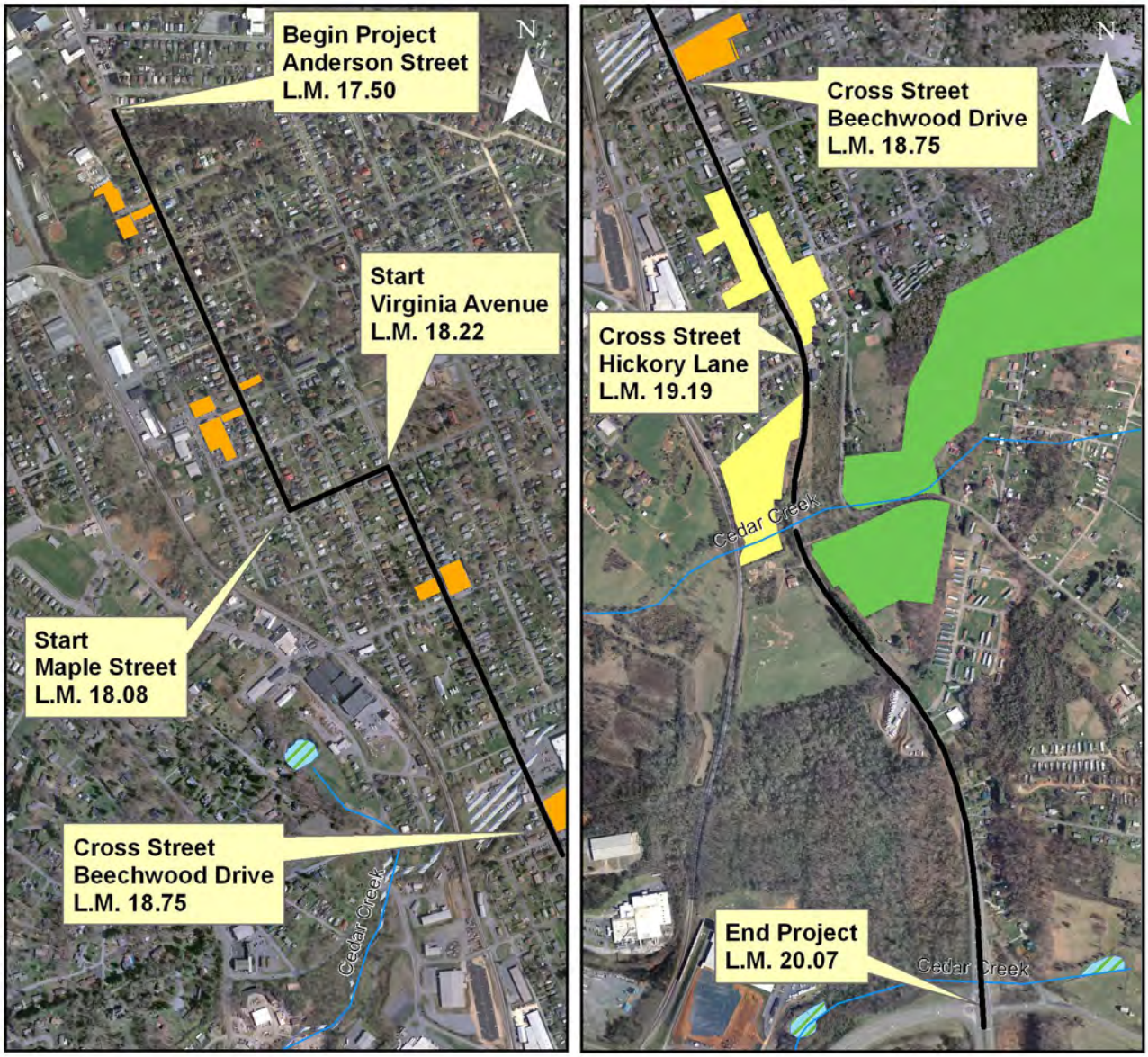
field review team expressed concern regarding the storage length available at the proposed intersection. The proposed new intersection with SR 34 and East Cedar Street under Options 3 and 3A would need to be signalized and coordinated with the railroad crossing signal gates. Numerous businesses are also located along East Cedar Street near the proposed intersection.

Environmental Impacts

Floodplains, Jurisdictional Waters, Wetlands

The project study area does not include a scenic waterway. There are culvert crossings of three (3) branches of the 303(d)-listed Cedar Creek. FEMA flood insurance rate maps identify the culvert at L.M. 18.68 as within a 100-year flood zone. Three (3) large (greater than half an acre), nationally listed wetlands lie within 4,000-feet of the corridor. Options 2, 2A, 3 and 3A would require environmental permits for improvements to the culvert crossings and construction run-off. None of the options would alter the identified wetlands. A no-rise certification is likely to be required for the floodplain at L.M. 18.68. Options 2, 2A, 3 and 3A may have a moderate impact on floodplains, jurisdictional waters and wetlands. These locations are shown on the environmental screening map in Figure 5. The Early Environmental Screening Process (EES) Report for the SR 34 corridor is included in the Appendix.

BRISTOL, SULLIVAN COUNTY



0 0.25 0.5 1 Miles

303(d) Listed Stream
Wetland
100-year Flood Zone
Church
Forested Land
Public Housing

FIGURE 5
EARLY ENVIRONMENTAL SCREENING

Sinkholes

There are currently no known sinkholes or caves within 10,000-feet of the corridor. However, construction of Option 2, 2A, 3 or 3A may potentially have a minimal impact on the outlying sinkholes. The entrance to Bristol Caverns is 2.5 miles southeast of the limits of the study area. The project lies in an area with karst geology. Pyritic rocks of the Maynardville Limestone, Nolichucky Shale, Knox Group and Honaker Dolomite are present within 2,000-feet of the corridor.

Threatened or Endangered Species

There is a known occurrence of *Phoxinus tennesseensis* (Tennessee Dace), a rare, state, or federally-protected aquatic species deemed in need of management within 10,000-feet of the corridor. Options 2, 2A, 3 and 3A should have a minimal impact on this species. A survey for the species is likely to be required.

There is no known occurrence of a rare, state, or federally-protected bat species within 1,000-feet of the corridor. There is no known occurrence of a rare, state, or federally-protected terrestrial species within 4,000-feet of the corridor. There is no known occurrence of a state or federally protected plant within one (1) mile of the proposed study area.

Hazardous Materials (underground storage tanks, landfills, etc.)

There are no known contaminated land tracts abutting or within the project study area. There may be underground fuel storage tanks at a gas station on the corner of Maple Street and Virginia Avenue (L.M. 18.20). However, build options 2, 2A, 3 and 3A avoid this area by relocating the connection between Pennsylvania Avenue and Virginia Avenue away from Maple Street to the south.

Forested Land

There is one (1) privately-owned tract of forested land in the study area, shown on the environmental screening map in Figure 5. None of the options would have an impact on this property.

Park or Wildlife Refuge

The project is greater than one (1) mile from a Natural Area. There are three (3) local parks located within or abutting the project study area. Rotary Park and Barker Park are inside the project study area. Defriece Park abuts the project study area to the west of the Norfolk Southern Railway main line. None of the options would have an impact on these parks.

Environmental Justice Areas (Title VI)

The Environmental Protection Agency's (EPA) Environmental Justice assessment tool did not identify any disproportionately high and adverse effects on low-income populations, minority populations or Limited English Proficiency populations. The minority population was less than ten (10) percent of the total population and the poverty status ranged from ten (10) to thirty (30) percent of the total population. One (1) to two (2) percent of the total population speaks English less than well. While Bristol Housing Authority residential units are located along Virginia Avenue (SR 34) between Hazelwood Street and Hickory Lane, none of the options should have adverse environmental justice impacts.

Cultural Impacts

Historic Properties

The Pennsylvania Avenue (L.M. 17.50 – L.M. 18.08) and Maple Street (L.M. 18.08 – L.M. 18.20) portions of the corridor pass through the Fairmount neighborhood. The City is evaluating the neighborhood for designation as the "Fairmount Neighborhood National Register Historic

District." There are 31 contributing properties on the southwest side of Pennsylvania Avenue, 29 on the northeast side of Pennsylvania Avenue, five (5) on the northwest side of Maple Street and one (1) on the southeast side of Maple Street.

Option 1 would not have an adverse impact on any of these properties while Options 2 and 3 would have a moderate impact and Options 2A and 3A would have an extensive impact on most of these properties.

Cemeteries

There are no known cemeteries or cemetery properties within 1,000-feet of the corridor. None of the options would have an impact on cemeteries.

Churches

Five (5) churches own property along the corridor:

- Lynwood Bible Church is located on Lynwood Street one block southwest of the intersection with Pennsylvania Avenue (L.M. 17.63). The church owns property on the southwest quadrant of the intersection with Pennsylvania Avenue; the property is used as a parking lot.
- The Bible Church of God owns property on Pennsylvania Avenue near Cypress Street (L.M. 17.90), though this building does not appear to function as a church.
- Tennessee Avenue Baptist Church is located on Tennessee Avenue, one block southwest of the intersection of Pennsylvania Avenue and Cypress Street (L.M. 17.92). The church owns the property on the southwest quadrant of this intersection and uses it as a parking lot.
- Virginia Avenue United Methodist Church owns property on both sides of Virginia Avenue north of the East Cedar Street intersection (L.M. 18.41). The church building is set back from Virginia Avenue on the northeast side; the southwest side property is a parking lot.
- Virginia Avenue Baptist Church owns property on the northeast quadrant of the intersection of Virginia Avenue with Beechwood Drive (L.M. 18.75). The church building is separated from Virginia Avenue by a row of on-street parking, sidewalk and a shallow lawn.

Option 2 and 2A should have a minimal adverse impact on all of the above except for Virginia Avenue United Methodist Church. The church property spans across Virginia Avenue north of East Cedar Street and Options 2 and 2A may impact the parking for the church. Options 3 and 3A should have a minimal impact on all of the church properties identified above. Option 3 and 3A will have a minimal impact on the Grace Baptist Deaf Church, which is located at 212 East Cedar Street, opposite the intersection with Pennsylvania Avenue. Church locations are visible on the environmental screening map in Figure 5.

Schools

Fairmount Elementary School is located approximately 1,000-feet northeast of the corridor on Cypress Street. The school catchment area spans the Norfolk Southern Railway mainline and staff, students and school buses use the corridor to access the school. A federal Safe Routes to Schools grant is being used to provide sidewalk connectivity between the school and the Fairmount neighborhood. Options 2, 2A, 3 and 3A should have a favorable impact upon Fairmount Elementary School by improving access, providing some accommodation for bicycle use and enhancing sidewalk conditions and connectivity.

Public Buildings

The Bristol Tennessee Housing Authority owns Edgemont Towers, a single family public housing estate one (1) block west of the intersection of Virginia Avenue and Hickory Lane (L.M. 19.19), shown on the environmental screening map in Figure 5. Bristol Housing Authority residential units are located along Virginia Avenue (SR 34) between Hazelwood Street and Hickory Lane. Options 2A and 3A may have a minimal adverse impact to the single family public housing along Virginia Avenue as this may cause a potential loss of existing street trees. However, Option 2 and 3 proposed improvements should not impact the existing trees.

Residents may also perceive the trade-off between on-street parking and a signed bicycle facility that prohibits parking to be an undesirable alternative. Additional community input is needed to determine the support for designating existing shoulders/parking as a bicycle facility. The public housing units should experience a positive impact from the improved sidewalk condition and connectivity proposed in options 2, 2A, 3 and 3A.

Structural Impacts

Bridges

There are no bridges along the corridor.

Railroad Crossings

The Norfolk Southern Railway main line runs parallel to SR 34 in the project study area. Improvement options do not include any new grade crossings. The recently-completed Anderson Street Bridge carries SR 34 over the Norfolk Southern Railway main line. At-grade crossings exist on East Cedar Street and Hazelwood Street. Options 2 and 2A would improve left-turn access to East Cedar Street and may have a minimal impact on the number of vehicles delayed when the crossing is closed for rail traffic. Option 3 and 3A would route SR 34 traffic to the intersection of Pennsylvania Avenue and East Cedar Street, immediately east of the railroad crossing. Option 3 and 3A would have an extreme impact on the railroad crossing at East Cedar Street. This new intersection of SR 34 and East Cedar Street would need to be signalized, interconnected and coordinated with the at-grade East Cedar Street railroad crossing.

Major Rock Cuts

There are no major rock cuts in the study area.

ASSESSMENT OF CORRIDOR OPTIONS

The Tennessee Department of Transportation has adopted seven guiding principles against which all transportation projects are to be evaluated. These guiding principles address concerns for system management, mobility, economic growth, safety, community, environmental stewardship, and fiscal responsibility. These guiding principles are discussed as they relate to the options for improving SR 34 in Bristol, Sullivan County.

Guiding Principle 1: Preserve and Manage the Existing Transportation System

Improvements to this portion of SR 34/ US 421 were first proposed in the 1969 LRTP, compiled by the Tennessee and Virginia Departments of Transportation. Improvements have been proposed in each LRTP adopted by the subsequently-incepted Bristol MPO, including the current *Bristol Urban Area Long-Range Transportation Plan Year 2030 Update* (adopted in 2008). The current LRTP recommendations include widening, provision of bicycle lanes and realignment of the Pennsylvania Avenue to Virginia Avenue connection. These recommendations are supported by the findings of this study.

The four (4) build alternatives presented in this report (Options 2, 2A, 3 and 3A) would eliminate a geometric deficiency at the two (2) 90-degree turns at Maple Street and improve lane widths between Monte Vista Lane and Willow Street. Options 2, 2A, 3 and 3A include provision of a TWLTL. This should improve mobility, reduce delay and reduce the incidence of crashes associated with left-turning vehicles. The TWLTL would also improve cross-town access by accommodating left-turns at East Cedar Street.

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

The four (4) build alternatives presented in this report (Options 2, 2A, 3 and 3A) include multimodal improvements to benefit the growing community. The bicycle and pedestrian facilities would improve multimodal connections between homes, businesses and schools. Vehicular mobility would also be improved; the turn lane improvements should reduce delay and crashes, and the geometric improvements would eliminate two (2) deficiencies.

The proposed bicycle facilities would meet the needs of the "Southeast" bicycle route in this corridor. The route, proposed in the *Bristol Tennessee Bicycle and Pedestrian Plan*, is a near ten (10) mile connection from US 11E at SR 394 to the state line at Georgia Avenue.

The new Fairmount Elementary School will draw students from both sides of the Norfolk Southern Railway mainline. Middle and high school students in the eastern portion of the study area must travel across the railroad mainline to access Vance Middle School and Tennessee High School. Sidewalks provided on SR 34 would enhance connectivity to sidewalks in the Fairmount neighborhood. The City is currently improving sidewalks leading to Fairmount Elementary School under a federal Safe Routes to School grant.

Guiding Principle 3: Support the State's Economy

This corridor is an important connection between downtown Bristol, growing residential neighborhoods and a growing employment area to the south. The improvements proposed in Options 2, 2A, 3 and 3A would secure the continued vitality of that connection.

The immediate study area is primarily residential, with some pockets of multi-family housing, commercial development and some industrial development in the vicinity. A 2005 study found that 43 percent of future residential growth will occur in east Bristol. The area north and east of the intersection of SR 34/ US 421 with SR 394 is identified in the land use plan as a primary area for future residential growth. The study found that, by 2030, SR 394 will support 61 percent of the future basic employment growth, with future commercial and industrial growth located along and between SR 394 and US 421.

Guiding Principle 4: Maximize Safety and Security

The proposed improvements should provide improved safety for all motorists. The safety of pedestrians and bicyclists will be improved by the sidewalk and shoulder improvements, respectively. The safety of motorists should be improved by increasing sight distance and improving lane width-related geometric deficiencies. Shoulders provide a safer area for disabled vehicles. The turn lane improvements should decrease the incidence of crashes related to left-turning vehicles.

Guiding Principle 5: Build Partnerships for Livable Communities

TDOT initiated this study in response to a request by a local official. The public has had the opportunity to comment on proposed improvements to this corridor during the development of each LRTP since 1969. Options 2, 2A, 3 and 3A include the improvements to the corridor consistent with those recommended in the most recently-adopted LRTP.

As the study moves beyond the Transportation Planning Report, public meetings will be conducted to involve the community in the National Environmental Policy Act (NEPA) process.

In the NEPA process, the "No-Build," and build options will be assessed in greater detail. Interested stakeholders will be able to contribute their input into the development of a locally-preferred alternative which mitigates adverse impacts while providing optimal benefit.

Guiding Principle 6: Promote Stewardship of the Environment

In the NEPA process, an appropriate environmental document will be prepared in order to fully address the impact of options within the Area of Potential Effects (APE). The APE is the geographic area in which an undertaking may directly or indirectly impact the environment. A more comprehensive analysis of the impacts will be completed at a later date to comply with NEPA. Table 10 indicates known environmental and cultural impacts.

Table 10: Known Environmental and Cultural Impacts

Impact	Option 1	Option 2	Option 2A	Option 3	Option 3A
Floodplains, Jurisdictional Waters, Wetlands		X	X	X	X
Sinkholes		X	X	X	X
Threatened or Endangered Species		X	X	X	X
Hazardous Materials					
Historic Properties		X	X	X	X
Churches		X	X	X	X

Guiding Principle 7: Promote Financial Responsibility

Planning level cost estimates for this report are based on the per mile expenses of roadways with similar typical sections. The cost estimates developed for this report are offered for comparison purposes and will fluctuate with inflation and any unforeseen circumstances. It is the Department's goal to follow a comprehensive transportation planning process, promote coordination among public and private operators of transportation systems, and support efforts to provide stable funding for the public component of the transportation system. This entails exercising financial responsibility in the development and implementation of roadway projects and minimizing costs to taxpayers.

SUMMARY

The improvements considered in this report will widen and improve SR 34 from Anderson Street to the SR 394 intersection. The improvements include the provision of bicycle accommodations and sidewalks and the realignment of the section of SR 34 that connects the Pennsylvania Avenue and Virginia Avenue sections via Maple Street.

The improvements are needed to address the following:

1. Replace the functionally obsolete section of SR 34 consisting of two 90-degree turns on Maple Street.
2. Reduce the rate of collisions resulting from left-turn movements.
3. Enhance the east-west linkage throughout the city.
4. Address a demand for improvements that has been documented for over 40 years.
5. Improve accessibility to schools and connect a growing residential area to jobs downtown and in the expanding industrial area while protecting the integrity of a historic neighborhood.

6. Improve pedestrian connectivity between residences and businesses. Connect to sidewalks in the Fairmount neighborhood, which are being improved by a federal Safe Routes to Schools grant. Provide bicycle accommodations on a portion of a planned bicycle route.
7. Address geometric deficiencies in lane width and provide shoulders.

This study includes a "No-Build" option, as well as four (4) build options. The build options are based on the projects identified in the Bristol LRTP and propose widening, turn-lanes, sidewalks, bicycle accommodations and options for addressing the functionally obsolete section of SR 34 along Maple Street between Pennsylvania Avenue and Virginia Avenue. These four (4) options are:

- Option 2 – Widen to 3 lanes and include a connection on Chesnut Street within 60' ROW
- Option 2A – Widen to 3 lanes and include a Chesnut Street connection within 72' ROW
- Option 3 – Widen to 3 lanes and include a connection on new location within 60' ROW
- Option 3A – Widen to 3 lanes and include a connection on new location within 72' ROW

The build options address the primary purpose and need as established in this document. If a build alternative is selected, the functional classification of SR 34 will likely remain an Urban Other Principal Arterial. Maple Street would no longer be part of SR 34 and maintenance for Maple Street would revert back to the City of Bristol. The new connection between Pennsylvania Avenue and Virginia Avenue would become part of the state system as SR 34. Table 11 summarizes the impacts of all the options considered in this report.

Table 11: Summary of Impacts

Identified Concern		Extent of Impact				
		Option 1	Option 2	Option 2A	Option 3	Option 3A
Safety	Positive	None	Minimal	Minimal	Minimal	Minimal
System Linkage		None	Extensive	Extensive	Extensive	Extensive
Transportation Demand		None	Extensive	Extensive	Extensive	Extensive
Social or Economic Development		None	Extensive	Extensive	Extensive	Extensive
Intermodal Relationships		None	Extensive	Extensive	Extensive	Extensive
Roadway Deficiencies		None	Extensive	Extensive	Extensive	Extensive
Floodplains, Jurisdictional Waters, Wetlands	Negative	None	Moderate	Moderate	Moderate	Moderate
Sinkholes		None	Minimal	Minimal	Minimal	Minimal
Threatened or Endangered Species		None	Minimal	Minimal	Minimal	Minimal
Hazardous Materials		None	None	None	None	None
Historic Properties		None	Moderate	Extensive	Moderate	Extensive
Churches		None	Minimal	Minimal	Minimal	Minimal
Railroad Crossings		None	Minimal	Minimal	Extensive	Extensive
Estimated Cost		Routine Maintenance	$15,820,362	$17,639,439	$16,802,080	$17,642,692

Note: Cost estimates include inflation of 10% per year over 5 years.

APPENDIX

Detailed Summary of Costs for Option 2 (60-feet right-of-way)

RIGHT-OF-WAY	Unit	Quantity	Item Number	Unit Cost	Cost	
Land	Acre	0.1			$ 1,000	
Commercial	Acre	0.3			$ 5,000	
Residential	Acre	0.9			$ 311,000	
TOTAL						**$ 317,000**

CONSTRUCTION	Unit	Quantity	Item Number	Unit Cost	Cost	
Site Preparation						**$ 97,500**
Clearing & Grubbing	Acre	11	201-01	2500.00	$ 27,500	
Removal of asphalt pavement	SY	34,957	202-03.01	2.00	$ 70,000	
Earthwork						**$ 441,000**
Embankment (compacted in place)	CY	15,719	203-10	8.50	$ 133,700	
Road & Drainage Excavation	CY	21,014	203-01	10.96	$ 230,400	
Borrow Excavation (unclassified)	CY	6,809	203-03	11.29	$ 76,900	
Pavement materials						**$ 3,729,300**
base	tons	24,600	303-01	22.51	$ 553,800	
binder	tons	65	402-01	378.50	$ 24,700	
aggregate	tons	262	402-02	40.00	$ 10,500	
Asphalt Grading D	tons	3,500	411-01.10	84.81	$ 296,900	
Asphalt Grading A	tons	5,200	307-02.01	117.50	$ 611,000	
tack coat	tons	9	403-01	493.71	$ 4,500	
Asphalt Grading B-M2	tons	10,000	307-02.08	139.50	$ 1,395,000	
Sidewalk	SF	89,270	701-01.01	3.60	$ 321,400	
Curb & Gutter	CY	1,875	702-03	230.00	$ 431,300	
Pavement markings	Various		Various		$ 80,200	
Signals						**$ 132,900**
Drainage						**$ 787,100**
18" Concrete Pipe Culvert	LF	7,670	607-03.02	48.34	$ 370,800	
24" Concrete Pipe Culvert	LF	2,810	607-05.02	60.00	$ 168,600	
30" Concrete Pipe Culvert	LF	1,250	607-06.02	65.69	$ 82,200	
Catch Basins	EACH	66	611-12.01	2400.00	$ 158,400	
Rework catch basin (SR 394)	EACH	2	611-09.02	700.00	$ 1,400	
Catch Basin (Type 38) (SR 392)	EACH	2	611-38.01	2850.00	$ 5,700	
Miscellaneous						**$ 145,400**
Signage	EACH	62	713-15.02	100.00	$ 6,200	
Topsoil	CY	5,158	203-07	15.00	$ 77,400	
Seeding	UNIT	194	801-01	31.29	$ 6,100	
Sodding	SY	14,863	803-01	3.63	$ 54,000	
Water	MG	168	801-03	10.03	$ 1,700	
TOTAL						**$ 5,333,200**

UTILITIES								
New above ground utilities							**$**	**79,700**
Overhead Utility and Light Pole								
400W Luminaire	EACH	12	714-09.04	630.00	$	7,600		
light standard	EACH	12	714-08.09	2510.00	$	30,200		
foundation	EACH	12	714-08.20	920.00	$	11,100		
Conduit	LF	1,300	714-03.01	10.00	$	13,000		
Pull Box	EACH	12	714-05.02	400.00	$	4,800		
Cable	LF	1,300	714-06.06	10.00	$	13,000		
New below ground utilities							**$**	**49,600**
Manhole	EACH	1	611-01-20	4510	$	4,600		
Firehydrants	EACH	5	775-12.83	3400	$	17,000		
Sewer Line	LF	200	775-12.81	100	$	20,000		
Water Line	LF	200	775-12.81	40	$	8,000		
Relocation of above ground utilities							**$**	**88,000**
Light Pole	EACH	44		2000	$	88,000		
Relocation of below ground utilities							**$**	**1,430,600**
Manhole	EACH	35	611-01-20	4510	$	157,900		
Firehydrants	EACH	10	775-12.83	740	$	7,400		
Sewer Line	LF	8,760	775-12.81	100	$	876,000		
Water Line	LF	8,760	775-12.81	40	$	350,400		
Gate Valve	EACH	27	775-12-83	1440	$	38,900		
TOTAL							**$**	**1,647,900**
Mobilization	$430,000 + 3.5% Construction over $10,000,000						$	430,000
Erosion Control	3.5% of Construction						$	186,700
Contingency	15% of Construction Cost + Utilities						$	1,047,200
TOTAL CONSTRUCTION COST							**$**	**8,645,000**
PRELIMINARY ENGINEERING	10% of Construction Cost						**$**	**864,500**
TOTAL (without inflation)							$	9,826,500
Inflation	10% per year over 5 years						$	5,999,177
TOTAL COSTS							**$**	**15,825,677**

Detailed Summary of Costs for Option 2A (72-feet right-of-way)

RIGHT-OF-WAY	Unit	Quantity	Item Number	Unit Cost	Cost		
Land	Acre	0.1			$ 1,000		
Commercial	Acre	0.5			$ 10,000		
Residential	Acre	2.3			$ 343,000		
TOTAL						**$**	**354,000**
CONSTRUCTION							
	Unit	Quantity	Item Number	Unit Cost	Cost		
Site Preparation						**$**	**102,500**
Clearing & Grubbing	Acre	13	201-01	2500.00	$ 32,500		
Removal of asphalt pavement	SY	34,957	202-03.01	2.00	$ 70,000		
Earthwork						**$**	**721,800**
Embankment (compacted in place)	CY	25,834	203-10	8.50	$ 219,600		
Road & Drainage Excavation	CY	45,815	203-01	10.96	$ 502,200		
Borrow Excavation (unclassified)	CY	0	203-03	11.29	$ -		
Pavement materials						**$**	**4,039,100**
base	tons	26,900	303-01	22.51	$ 605,600		
binder	tons	70	402-01	378.50	$ 26,500		
aggregate	tons	280	402-02	40.00	$ 11,200		
Asphalt Grading D	tons	4,000	411-01.10	84.81	$ 339,300		
Asphalt Grading A	tons	5,700	307-02.01	117.50	$ 669,800		
tack coat	tons	11	403-01	493.71	$ 5,500		
Asphalt Grading B-M2	tons	11,100	307-02.08	139.50	$ 1,548,500		
Sidewalk	SF	89,270	701-01.01	3.60	$ 321,400		
Curb & Gutter	CY	1,875	702-03	230.00	$ 431,300		
Pavement markings	Various		Various		$ 80,000		
Signals							
Drainage						**$**	**132,885**
18" Concrete Pipe Culvert	LF	7,670	607-03.02	48.34	$ 370,800	**$**	**787,100**
24" Concrete Pipe Culvert	LF	2,810	607-05.02	60.00	$ 168,600		
30" Concrete Pipe Culvert	LF	1,250	607-06.02	65.69	$ 82,200		
Catch Basins	EACH	66	611-12.01	2400.00	$ 158,400		
Rework catch basin (SR 394)	EACH	2	611-09.02	700.00	$ 1,400		
Catch Basin (Type 38) (SR 392)	EACH	2	611-38.01	2850.00	$ 5,700		
Miscellaneous						**$**	**187,900**
Signage	EACH	62	713-15.02	100.00	$ 6,200		
Topsoil	CY	10,406	203-07	15.00	$ 156,100		
Seeding	UNIT	693	801-01	31.29	$ 21,700		
Sodding	SY	827	803-01	3.63	$ 3,100		
Water	MG	78	801-03	10.03	$ 800		
TOTAL						**$**	**5,971,285**

UTILITIES								
New above ground utilities							**$**	**79,700**
Overhead Utility and Light Pole								
400W Luminaire	EACH	12	714-09.04	630.00	$	7,600		
light standard	EACH	12	714-08.09	2510.00	$	30,200		
foundation	EACH	12	714-08.20	920.00	$	11,100		
Conduit	LF	1,300	714-03.01	10.00	$	13,000		
Pull Box	EACH	12	714-05.02	400.00	$	4,800		
Cable	LF	1,300	714-06.06	10.00	$	13,000		
New below ground utilities							**$**	**49,600**
Manhole	EACH	1	611-01-20	4510	$	4,600		
Firehydrants	EACH	5	775-12.83	3400	$	17,000		
Sewer Line	LF	200	775-12.81	100	$	20,000		
Water Line	LF	200	775-12.81	40	$	8,000		
Relocation of above ground utilities							**$**	**299,200**
Light Pole	EACH	48		2000	$	96,000		
Power Pole	EACH	16		12700	$	203,200		
Relocation of below ground utilities							**$**	**1,430,600**
Manhole	EACH	35	611-01-20	4510	$	157,900		
Firehydrants	EACH	10	775-12.83	740	$	7,400		
Sewer Line	LF	8,760	775-12.81	100	$	876,000		
Water Line	LF	8,760	775-12.81	40	$	350,400		
Gate Valve	EACH	27	775-12-83	1440	$	38,900		
TOTAL							**$**	**1,859,100**
Mobilization	$430,000 + 3.5% Construction over $10,000,000						$	430,000
Erosion Control	3.5% of Construction						$	209,000
Contingency	15% of Construction Cost + Utilities						$	1,174,600
TOTAL CONSTRUCTION COST							**$**	**9,643,985**
PRELIMINARY ENGINEERING	10% of Construction Cost						**$**	**964,399**
TOTAL (without inflation)							$	10,962,384
Inflation	10% per year over 5 years						$	6,692,645
TOTAL COSTS							**$**	**17,655,028**

Detailed Summary of Costs for Option 3 (60-feet right-of-way)

RIGHT-OF-WAY	Unit	Quantity	Item Number	Unit Cost	Cost	
Land	Acre	0.1			$ 2,000	
Commercial	Acre	0.2			$ 5,000	
Residential	Acre	1.9			$ 571,000	
TOTAL						**$ 576,000**

CONSTRUCTION	Unit	Quantity	Item Number	Unit Cost	Cost	
Site Preparation						**$ 88,400**
Clearing & Grubbing	Acre	11	201-01	2500.00	$ 27,500	
Removal of asphalt pavement	SY	30,435	202-03.01	2.00	$ 60,900	
Earthwork						**$ 327,300**
Embankment (compacted in place)	CY	10,057	203-10	8.50	$ 85,500	
Road & Drainage Excavation	CY	22,060	203-01	10.96	$ 241,800	
Borrow Excavation (unclassified)	CY	0	203-03	11.29	$ -	
Pavement materials						**$ 4,020,400**
base	tons	24,600	303-01	22.51	$ 553,800	
binder	tons	63	402-01	378.50	$ 23,900	
aggregate	tons	255	402-02	40.00	$ 10,200	
Asphalt Grading D	tons	6,300	411-01.10	84.81	$ 534,400	
Asphalt Grading A	tons	5,300	307-02.01	117.50	$ 622,800	
tack coat	tons	9	403-01	493.71	$ 4,500	
Asphalt Grading B-M2	tons	10,300	307-02.08	139.50	$ 1,436,900	
Sidewalk	SF	86,803	701-01.01	3.60	$ 312,500	
Curb & Gutter	CY	1,925	702-03	230.00	$ 442,800	
Pavement markings	Various		Various		$ 78,600	
Signals						**$ 132,900**
Drainage						**$ 764,800**
18" Concrete Pipe Culvert	LF	7,430	607-03.02	48.34	$ 359,200	
24" Concrete Pipe Culvert	LF	2,960	607-05.02	60.00	$ 177,600	
30" Concrete Pipe Culvert	LF	950	607-06.02	65.69	$ 62,500	
Catch Basins	EACH	66	611-12.01	2400.00	$ 158,400	
Rework catch basin (SR 394)	EACH	2	611-09.02	700.00	$ 1,400	
Catch Basin (Type 38) (SR 392)	EACH	2	611-38.01	2850.00	$ 5,700	
Miscellaneous						**$ 133,500**
Signage	EACH	69	713-15.02	100.00	$ 6,900	
Topsoil	CY	4,311	203-07	15.00	$ 64,700	
Seeding	UNIT	115	801-01	31.29	$ 3,600	
Sodding	SY	15,590	803-01	3.63	$ 56,600	
Water	MG	167	801-03	10.03	$ 1,700	
TOTAL						**$ 5,467,300**

UTILITIES							
New above ground utilities							**$ 142,300**
Overhead Utility and Light Pole							
400W Luminaire	EACH	22	714-09.04	630.00	$	13,900	
light standard	EACH	22	714-08.09	2510.00	$	55,300	
foundation	EACH	22	714-08.20	920.00	$	20,300	
Conduit	LF	2,200	714-03.01	10.00	$	22,000	
Pull Box	EACH	22	714-05.02	400.00	$	8,800	
Cable	LF	2,200	714-06.06	10.00	$	22,000	
New below ground utilities							**$ 385,300**
Manhole	EACH	8	611-01-20	4510	$	36,100	
Firehydrants	EACH	10	775-12.83	3400	$	34,000	
Sewer Line	LF	2,200	775-12.81	100	$	220,000	
Water Line	LF	2,200	775-12.81	40	$	88,000	
Gate Valve	EACH	5	775-12-83	1440	$	7,200	
Relocation of above ground utilities							**$ 74,000**
Light Pole	EACH	37		2000	$	74,000	
Relocation of below ground utilities							**$ 1,185,200**
Manhole	EACH	25	611-01-20	4510	$	112,800	
Firehydrants	EACH	8	775-12.83	740	$	6,000	
Sewer Line	LF	7,360	775-12.81	100	$	736,000	
Water Line	LF	7,360	775-12.81	40	$	294,400	
Gate Valve	EACH	25	775-12-83	1440	$	36,000	
TOTAL							**$ 1,786,800**

Mobilization	$430,000 + 3.5% Construction over $10,000,000	$	430,000
Erosion Control	3.5% of Construction	$	191,400
Contingency	15% of Construction Cost + Utilities	$	1,088,200
TOTAL CONSTRUCTION COST		**$**	**8,963,700**
PRELIMINARY ENGINEERING	10% of Construction Cost	**$**	**896,370**
TOTAL (without inflation)		$	10,436,070
Inflation	10% per year over 5 years	$	6,371,325
TOTAL COSTS		**$**	**16,807,395**

Detailed Summary of Costs for Option 3A (72-feet right-of-way)

RIGHT-OF-WAY	Unit	Quantity	Item Number	Unit Cost	Cost	
Land	Acre	0.2			$ 3,000	
Commercial	Acre	0.5			$ 10,000	
Residential	Acre	2.9			$ 609,000	
TOTAL						**$ 622,000**

CONSTRUCTION	Unit	Quantity	Item Number	Unit Cost	Cost	
Site Preparation						**$ 88,400**
Clearing & Grubbing	Acre	11	201-01	2500.00	$ 27,500	
Removal of asphalt pavement	SY	30,435	202-03.01	2.00	$ 60,900	
Earthwork						**$ 542,700**
Embankment (compacted in place)	CY	15,543	203-10	8.50	$ 132,200	
Road & Drainage Excavation	CY	37,447	203-01	10.96	$ 410,500	
Borrow Excavation (unclassified)	CY	0	203-03	11.29	$ -	
Pavement materials						**$ 3,947,500**
base	tons	26,100	303-01	22.51	$ 587,600	
binder	tons	68	402-01	378.50	$ 25,800	
aggregate	tons	273	402-02	40.00	$ 11,000	
Asphalt Grading D	tons	3,900	411-01.10	84.81	$ 330,800	
Asphalt Grading A	tons	5,600	307-02.01	117.50	$ 658,000	
tack coat	tons	11	403-01	493.71	$ 5,500	
Asphalt Grading B-M2	tons	10,800	307-02.08	139.50	$ 1,506,600	
Sidewalk	SF	86,803	701-01.01	3.60	$ 312,500	
Curb & Gutter	CY	1,875	702-03	230.00	$ 431,300	
Pavement markings	Various		Various		$ 78,400	
Signals						**$ 132,885**
Drainage						**$ 764,800**
18" Concrete Pipe Culvert	LF	7,430	607-03.02	48.34	$ 359,200	
24" Concrete Pipe Culvert	LF	2,960	607-05.02	60.00	$ 177,600	
30" Concrete Pipe Culvert	LF	950	607-06.02	65.69	$ 62,500	
Catch Basins	EACH	66	611-12.01	2400.00	$ 158,400	
Rework catch basin (SR 394)	EACH	2	611-09.02	700.00	$ 1,400	
Catch Basin (Type 38) (SR 392)	EACH	2	611-38.01	2850.00	$ 5,700	
Miscellaneous						**$ 151,200**
Signage	EACH	69	713-15.02	100.00	$ 6,900	
Topsoil	CY	8,233	203-07	15.00	$ 123,500	
Seeding	UNIT	547	801-01	31.29	$ 17,200	
Sodding	SY	789	803-01	3.63	$ 2,900	
Water	MG	63	801-03	10.03	$ 700	
TOTAL						**$ 5,627,485**

UTILITIES								
New above ground utilities							**$**	**142,300**
Overhead Utility and Light Pole								
400W Luminaire	EACH	22	714-09.04	630.00	$	13,900		
light standard	EACH	22	714-08.09	2510.00	$	55,300		
foundation	EACH	22	714-08.20	920.00	$	20,300		
Conduit	LF	2,200	714-03.01	10.00	$	22,000		
Pull Box	EACH	22	714-05.02	400.00	$	8,800		
Cable	LF	2,200	714-06.06	10.00	$	22,000		
New below ground utilities							**$**	**385,300**
Manhole	EACH	8	611-01-20	4510	$	36,100		
Firehydrants	EACH	10	775-12.83	3400	$	34,000		
Sewer Line	LF	2,200	775-12.81	100	$	220,000		
Water Line	LF	2,200	775-12.81	40	$	88,000		
Gate Valve	EACH	5	775-12-83	1440	$	7,200		
Relocation of above ground utilities							**$**	**285,200**
Light Pole	EACH	41		2000	$	82,000		
Power Pole	EACH	16		12700	$	203,200		
Relocation of below ground utilities							**$**	**1,185,200**
Manhole	EACH	25	611-01-20	4510	$	112,800		
Firehydrants	EACH	8	775-12.83	740	$	6,000		
Sewer Line	LF	7,360	775-12.81	100	$	736,000		
Water Line	LF	7,360	775-12.81	40	$	294,400		
Gate Valve	EACH	25	775-12-83	1440	$	36,000		
TOTAL							**$**	**1,998,000**
Mobilization	$430,000 + 3.5% Construction over $10,000,000						$	430,000
Erosion Control	3.5% of Construction						$	197,000
Contingency	15% of Construction Cost + Utilities						$	1,143,900
TOTAL CONSTRUCTION COST							**$**	**9,396,385**
PRELIMINARY ENGINEERING	10% of Construction Cost						**$**	**939,639**
TOTAL (without inflation)							$	10,958,024
Inflation	10% per year over 5 years						$	6,689,983
TOTAL COSTS							**$**	**17,648,006**

TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO. ---

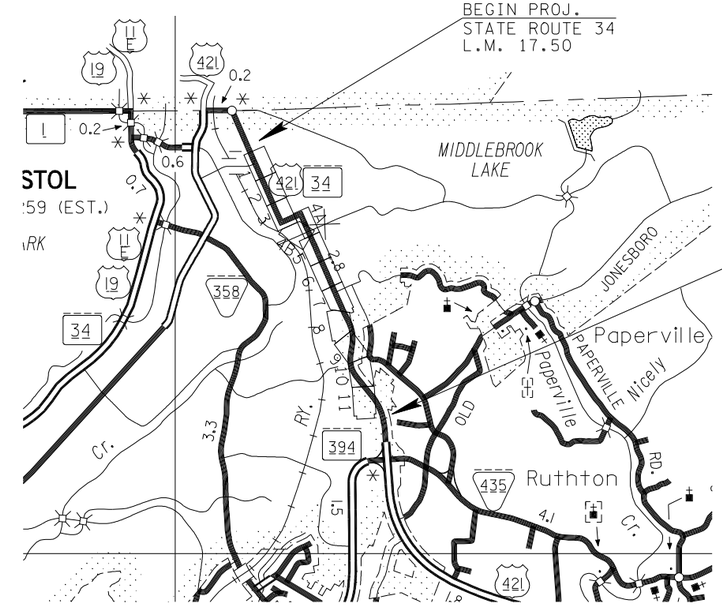
TENN.	YEAR	SHEET NO.
	2009	1
FED. AID PROJ. NO.		
STATE PROJ. NO.		

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING

SULLIVAN COUNTY

STATE ROUTE 34 (U.S. 421)
FROM: ANDERSON STREET
TO: STATE ROUTE 394

STATE HIGHWAY NO. 34 F.A.H.S. NO.



SCALE: 1"= ½ MILE

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, 1995 AND ADDITIONAL SPECIFICATIONS AND SPECIAL PROVISIONS CONTAINED IN THE PLANS AND IN THE PROPOSAL CONTRACT

TDOT ROAD SP. SV. 2 _____

DESIGNER _____ CHECKED BY _____

P.E. NO. _____

EXISTING ROADWAY LENGTH = 2.57 MILES
OPTION 2 & 2A = 2.54 MILES
OPTION 3 & 3A = 2.53 MILES

APPROVED: _____
CHIEF ENGINEER

DATE: _____

APPROVED: _____
COMMISSIONER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED: _____ _____
DIVISION ADMINISTRATOR DATE

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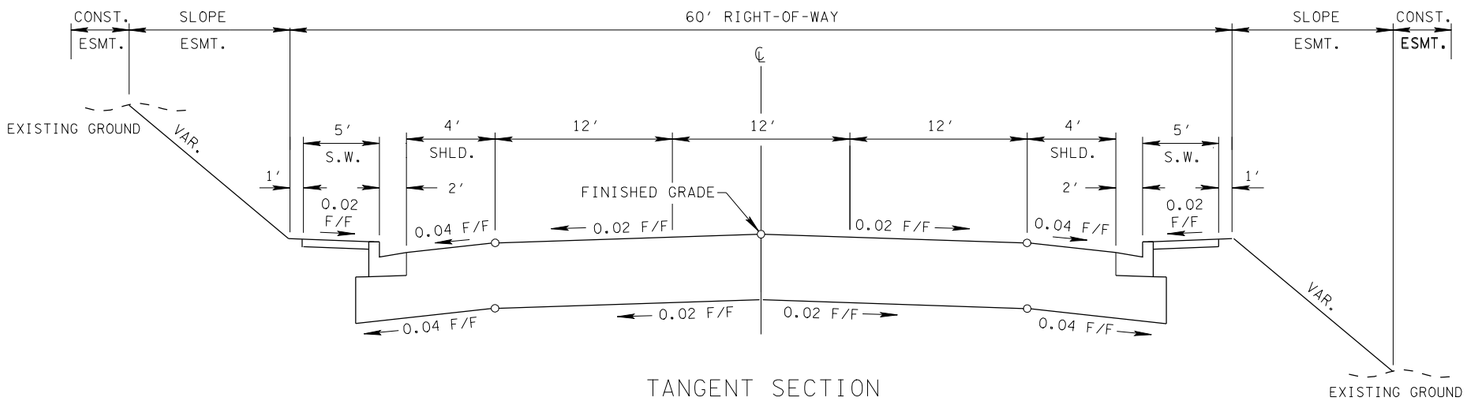
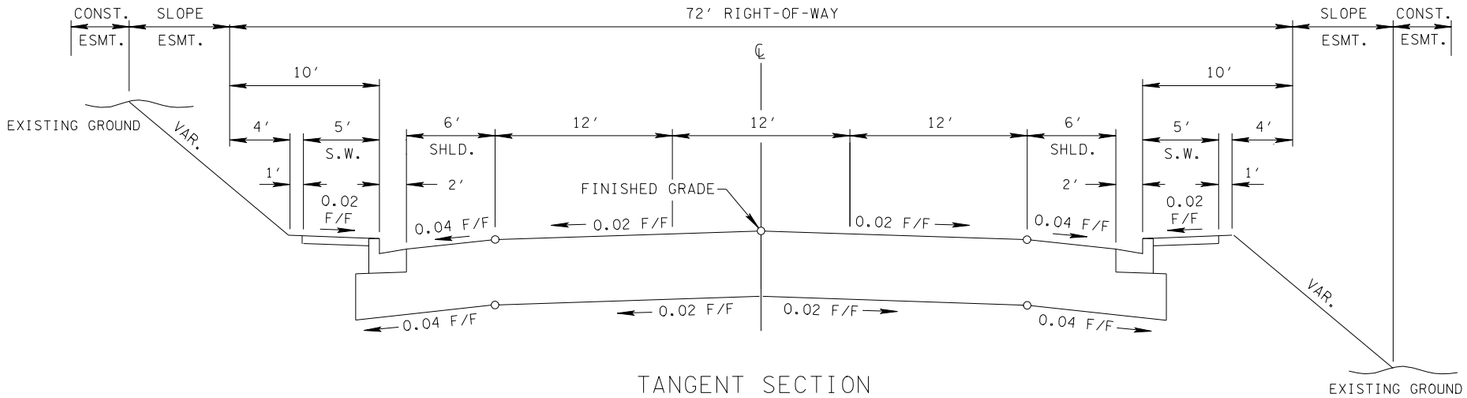
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		1A



TANGENT SECTION
OPTION 2 & 3 (60' ROW)



TANGENT SECTION
(BASED ON STD. DWG. RD01-TS-3)
OPTION 2A & 3A (72' ROW)

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

STATE ROUTE 34
BRISTOL, TN

12-OCT-2009 08:45
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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		2

TAYLOR ST

LYNWOOD ST

L.M. 17.58

PENNSYLVANIA AVE

PENNSYLVANIA AVE

SEE SHEET NO. 3

L.M. 17.72

MATCH LINE

ANDERSON ST

TIE INTO EXISTING
INTERSECTION AT
ANDERSON ST

BEGIN PROJECT
L.M. 17.50

54-FT ROW
From L.M. 17.58
To L.M. 18.08

ASH ST

N

LEGEND

60' PROP. ROW

EXISTING ANDERSON ST ALIGNMENT

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		3

KENTUCKY AVE

POPLAR ST

L.M. 17.83

PENNSYLVANIA AVE

SPRUCE ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

CYPRESS ST

SEE SHEET NO. 2
MATCH LINE L.M. 17.72

SEE SHEET NO. 4
MATCH LINE L.M. 17.97

N

LEGEND
60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		4

MATCH LINE L.M. 18.25 SEE SHEET NO. 5

KENTUCKY AVE

PINE ST

L.M. 18.08

PENNSYLVANIA AVE

MATCH LINE L.M. 17.97 SEE SHEET NO. 3

54-FT ROW
From L.M. 17.58
To L.M. 18.08

MAPLE ST

CHESNUT ST

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		5

CAROLINA AVE

CAROLINA AVE

CHESNUT ST

L.M. 18.30

MODIFY EXISTING
TRAFFIC SIGNAL

VIRGINIA AVE

62-FT ROW
From L.M. 18.08
To L.M. 18.65

EAST CEDAR ST

MATCH LINE L.M. 18.25 SEE SHEET NO. 4

MATCH LINE L.M. 18.51 SEE SHEET NO. 6

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		6

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		7

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		8

CAROLINA AVE

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.08

VIRGINIA AVE

SEE SHEET NO. 7

MATCH LINE L.M. 19.01

BIRCH ST

WILLOW ST

HICKORY LN

KENTUCKY AVE

SEE SHEET NO. 9

MATCH LINE L.M. 19.22

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		9

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		10

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		11

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.91

SR 34 (U.S. 421)

Carl R. Moore Parkway

SEE SHEET NO. 10

L.M. 19.74

MATCH LINE

SEE SHEET NO. 12

L.M. 19.98

MATCH LINE

150-FT ROW
From L.M. 19.91
To L.M. 19.96

L.M. 19.96

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		12

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		2A

TAYLOR ST
KENTUCKY AVE
LYNWOOD ST
L.M. 17.58
PENNSYLVANIA AVE
PENNSYLVANIA AVE
SEE SHEET NO. 3A
17.72
L.M.
MATCH LINE
TIE INTO EXISTING
INTERSECTION AT
ANDERSON ST
54-FT ROW
From L.M. 17.58
To L.M. 18.08
ASH ST
ANDERSON ST
BEGIN PROJECT
L.M. 17.50
N

LEGEND

72' PROP. ROW

EXISTING ANDERSON ST ALIGNMENT

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		3A

KENTUCKY AVE

POPLAR ST

L.M. 17.83

PENNSYLVANIA AVE

SPRUCE ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

CYPRESS ST

SEE SHEET NO. 2A
L.M. 17.72
MATCH LINE

SEE SHEET NO. 4A
L.M. 17.97
MATCH LINE

N

LEGEND
72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		4A

MATCH LINE L.M. 18.25 SEE SHEET NO. 5A

KENTUCKY AVE

PINE ST

L.M. 18.08

PENNSYLVANIA AVE

MATCH LINE L.M. 17.97 SEE SHEET NO. 3A

54-FT ROW
From L.M. 17.58
To L.M. 18.08

MAPLE ST

CHESNUT ST

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		5A

CAROLINA AVE

CAROLINA AVE

CHESNUT ST

L.M. 18.30

MODIFY EXISTING
TRAFFIC SIGNAL

VIRGINIA AVE

62-FT ROW
From L.M. 18.08
To L.M. 18.65

EAST CEDAR ST

MATCH LINE L.M. 18.51 SEE SHEET NO. 6A

MATCH LINE L.M. 18.25 SEE SHEET NO. 4A

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		6A

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		7A

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		8A

CAROLINA AVE

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.08

VIRGINIA AVE

SEE SHEET NO. 7A

MATCH LINE L.M. 19.01

BIRCH ST

WILLOW ST

HICKORY LN

KENTUCKY AVE

MATCH LINE L.M. 19.22

SEE SHEET NO. 9A

N

LEGEND
72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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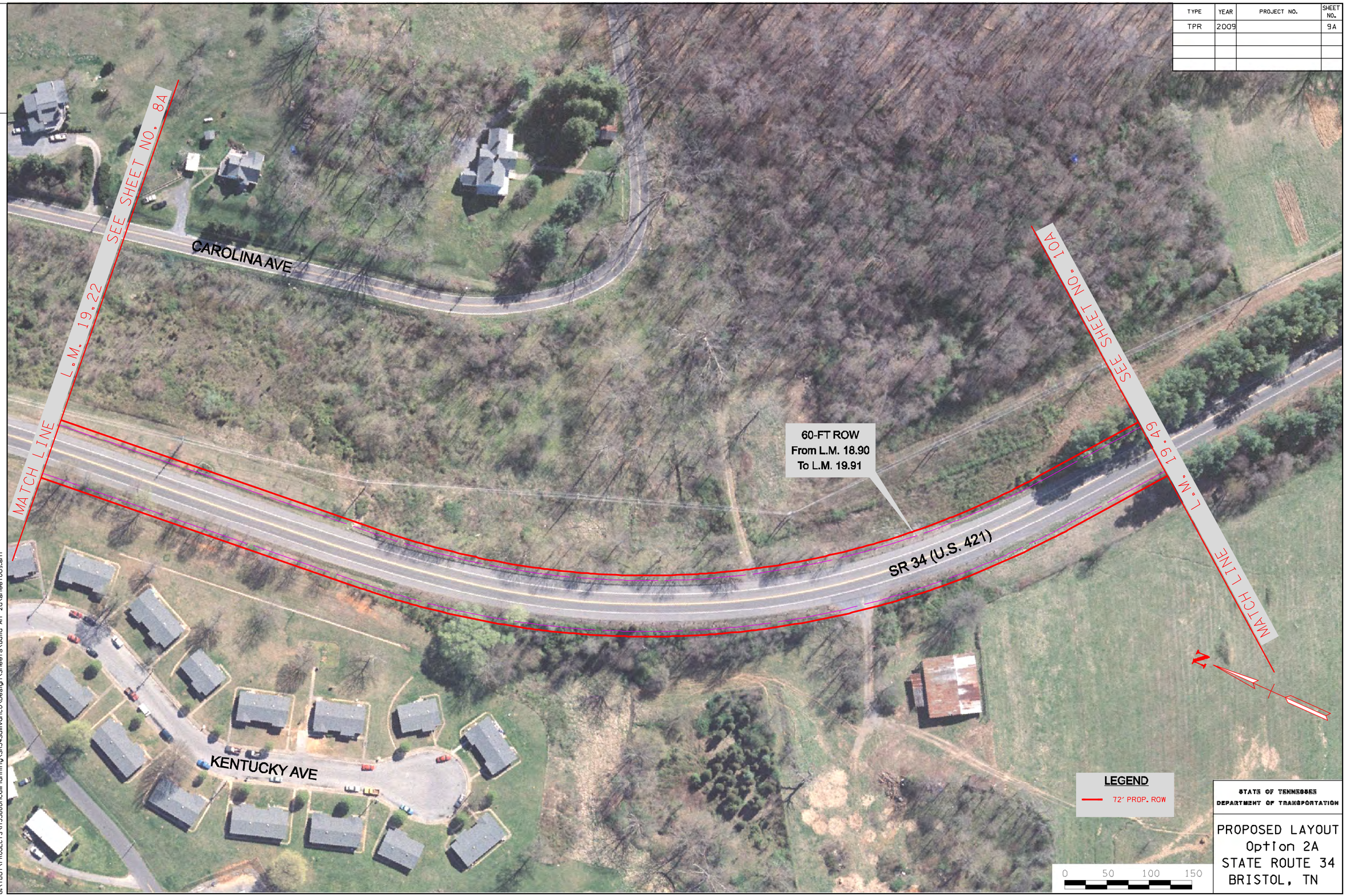
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		9A



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		10A

BROOKSIDE DR

60-FT ROW
From L.M. 18.90
To L.M. 19.91

SR 34 (U.S. 421)

L.M. 19.67

SEE SHEET NO. 9A

L.M. 19.49

MATCH LINE

SEE SHEET NO. 11A

L.M. 19.74

MATCH LINE

N

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		11A

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.91

SR 34 (U.S. 421)

Carl R. Moore Parkway

SEE SHEET NO. 10A

L.M. 19.74

MATCH LINE

150-FT ROW
From L.M. 19.91
To L.M. 19.96

L.M. 19.96

L.M. 19.98

MATCH LINE

SEE SHEET NO. 12A

N

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		12A

COBLE LN

BRISTOL CAVERNS HIGHWAY

SEE SHEET NO. 11A
19.98
L.M.
MATCH LINE

END PROJECT
L.M. 20.07

Carl R. Moore Parkway

Carl R. Moore Parkway

HIGHWAY 394

300-FT ROW
From L.M. 19.96
To End of Project

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 2A
STATE ROUTE 34
BRISTOL, TN

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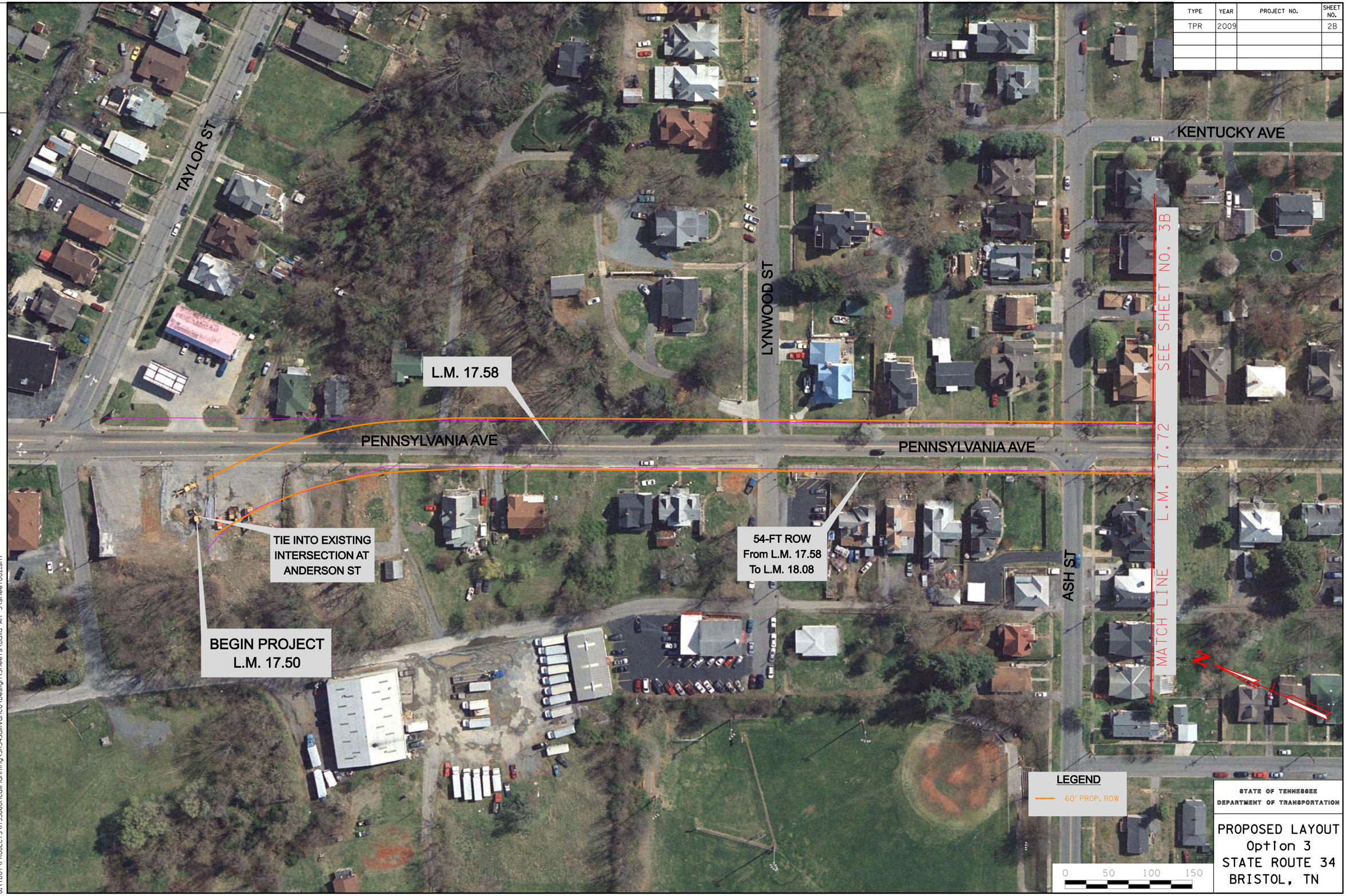
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		2B



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		3B

KENTUCKY AVE

POPLAR ST

L.M. 17.83

PENNSYLVANIA AVE

SPRUCE ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

CYPRESS ST

MATCH LINE L.M. 17.72 SEE SHEET NO. 2B

MATCH LINE L.M. 17.97 SEE SHEET NO. 4B

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		4B

KENTUCKY AVE

PINE ST

L.M. 18.08

PENNSYLVANIA AVE

MAPLE ST

CHESNUT ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

17.97 SEE SHEET NO. 3B MATCH LINE L.M.

18.22 SEE SHEET NO. 5B MATCH LINE L.M.

LEGEND
60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		5B

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		6B

LAKEVIEW ST

L.M. 18.58

L.M. 18.65

OAKWOOD ST

BEECHWOOD DR

VIRGINIA AVE

MATCH LINE L.M. 18.51 SEE SHEET NO. 5B

62-FT ROW
From L.M. 18.08
To L.M. 18.65

44-FT ROW
From L.M. 18.65
To L.M. 18.90

SOUTHERN ST

MONTE VISTA ST

MATCH LINE L.M. 18.75 SEE SHEET NO. 7B

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		7B

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		8B

CAROLINA AVE

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.08

VIRGINIA AVE

SEE SHEET NO. 7B

MATCH LINE L.M. 19.01

BIRCH ST

WILLOW ST

HICKORY LN

KENTUCKY AVE

SEE SHEET NO. 9B

MATCH LINE L.M. 19.22

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		9B

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		10B

BROOKSIDE DR

60-FT ROW
From L.M. 18.90
To L.M. 19.91

SR 34 (U.S. 421)

L.M. 19.67

SEE SHEET NO. 9B
L.M. 19.49
MATCH LINE

SEE SHEET NO. 11B
L.M. 19.74
MATCH LINE

N

LEGEND
60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		11B

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.91

SR 34 (U.S. 421)

Carl R. Moore Parkway

SEE SHEET NO. 10B

L.M. 19.74

MATCH LINE

150-FT ROW
From L.M. 19.91
To L.M. 19.96

L.M. 19.96

L.M. 19.98

MATCH LINE

SEE SHEET NO. 12B

N

LEGEND

60' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		12B

COBLE LN

BRISTOL CAVERNS HIGHWAY

SEE SHEET NO. 11B
19.98
L.M.
MATCH LINE

END PROJECT
L.M. 20.07

Carl R. Moore Parkway

Carl R. Moore Parkway

HIGHWAY 394

300-FT ROW
From L.M. 19.96
To End of Project

N

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		2C

TAYLOR ST

KENTUCKY AVE

LYNWOOD ST

L.M. 17.58

PENNSYLVANIA AVE

PENNSYLVANIA AVE

SEE SHEET NO. 3C

17.72

L.M.

MATCH LINE

TIE INTO EXISTING
INTERSECTION AT
ANDERSON ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

ASH ST

BEGIN PROJECT
L.M. 17.50

N

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		3C

KENTUCKY AVE

POPLAR ST

L.M. 17.83

PENNSYLVANIA AVE

SPRUCE ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

CYPRESS ST

SEE SHEET NO. 2C
L.M. 17.72
MATCH LINE

SEE SHEET NO. 4C
L.M. 17.97
MATCH LINE

N

LEGEND
72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		4C

KENTUCKY AVE

PINE ST

L.M. 18.08

PENNSYLVANIA AVE

MAPLE ST

CHESNUT ST

54-FT ROW
From L.M. 17.58
To L.M. 18.08

17.97 SEE SHEET NO. 3C MATCH LINE L.M.

18.22 SEE SHEET NO. 5C MATCH LINE L.M.

LEGEND
72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		5C

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		6C

LAKEVIEW ST

OAKWOOD ST

BEECHWOOD DR

L.M. 18.58

L.M. 18.65

VIRGINIA AVE

MATCH LINE L.M. 18.51 SEE SHEET NO. 5C

MATCH LINE L.M. 18.75 SEE SHEET NO. 7C

62-FT ROW
From L.M. 18.08
To L.M. 18.65

44-FT ROW
From L.M. 18.65
To L.M. 18.90

SOUTHERN ST

MONTE VISTA ST

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		7C

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		8C

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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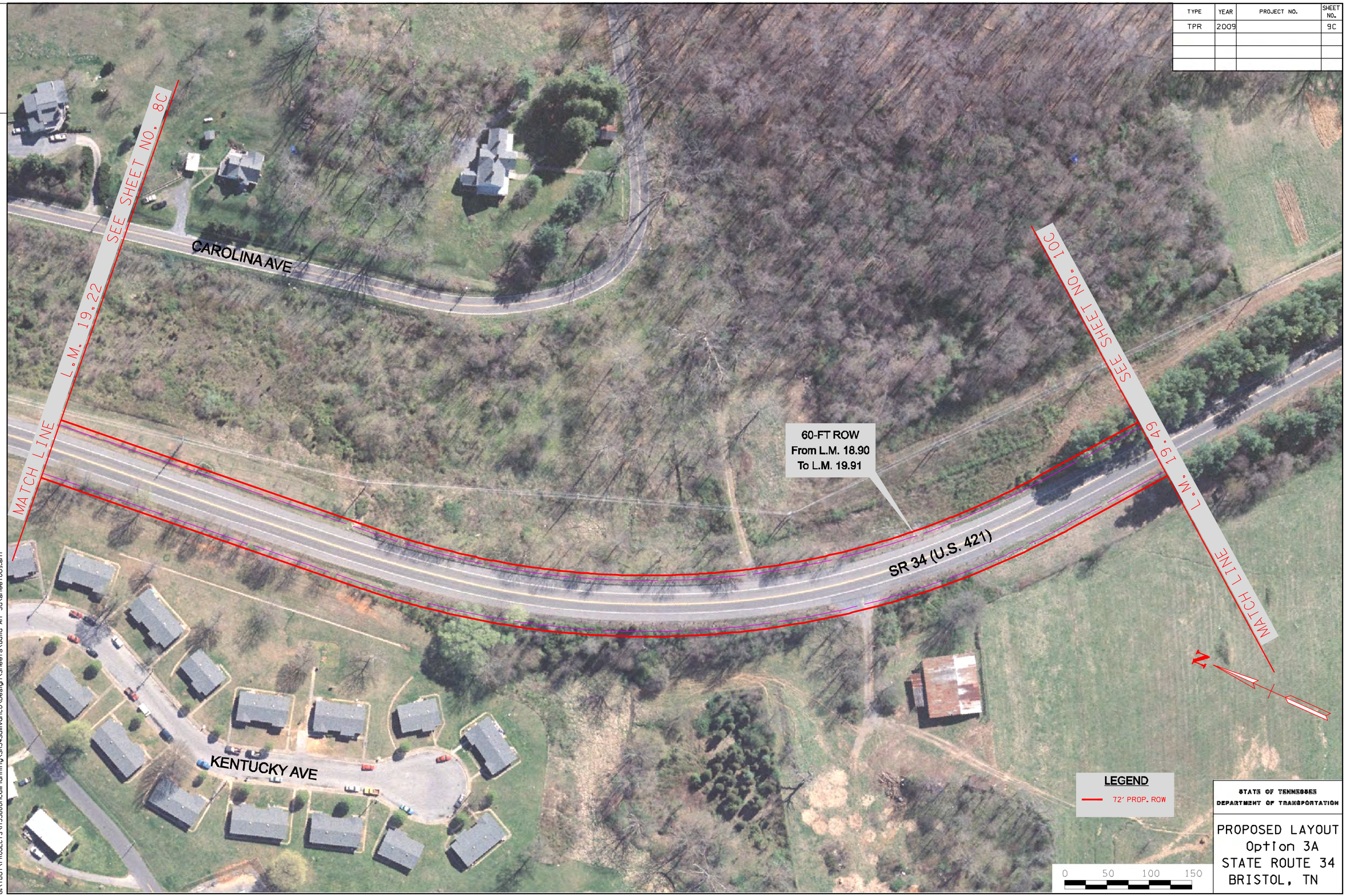
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		9C



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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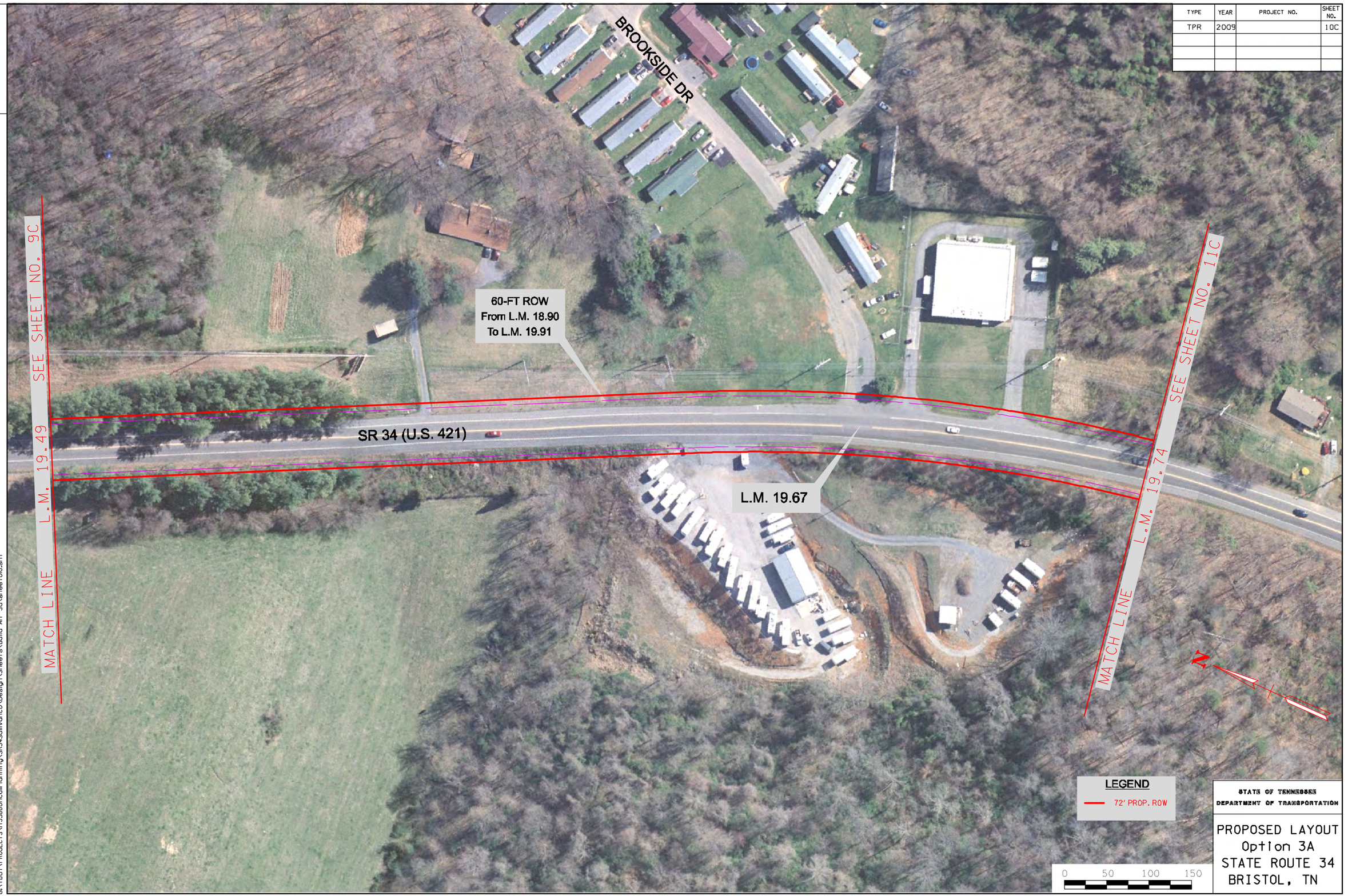
TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		10C



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		11C

60-FT ROW
From L.M. 18.90
To L.M. 19.91

L.M. 19.91

SR 34 (U.S. 421)

Carl R. Moore Parkway

SEE SHEET NO. 10C

L.M. 19.74

MATCH LINE

SEE SHEET NO. 12C

L.M. 19.98

MATCH LINE

150-FT ROW
From L.M. 19.91
To L.M. 19.96

L.M. 19.96

N

LEGEND

72' PROP. ROW

0 50 100 150

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE D.O.T.
DESIGN DIVISION
FILE NO.

TYPE	YEAR	PROJECT NO.	SHEET NO.
TPR	2009		12C

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

PROPOSED LAYOUT
Option 3A
STATE ROUTE 34
BRISTOL, TN

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TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION

PROJECT NO.: _____ ROUTE: S.R. 34
COUNTY: SULLIVAN CITY: BRISTOL
PROJECT PIN NUMBER: 112331.00
PROJECT DESCRIPTION: FROM EDGEMONT AVENUE TO THE S.R. 394/S.R. 435 INTERSECTION. [L.M. 16.76 TO L.M. 20.09]

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
9,450	2014	11,350	1,248	11	2034	55-45	3	4		

REQUESTED BY: NAME GENA GILLIAM DATE 2/20/09
DIVISION PROJECT PLANNING
ADDRESS 1000 J. K. POLK BUILDING
NASHVILLE TN 37243

REVIEWED BY: TONY ARMSTRONG Tony Armstrong DATE 7-30-09
TRANSPORTATION MANAGER 1
SUITE 1000, JAMES K. POLK BUILDING

APPROVED BY: BILL HART Bill Hart DATE 7/30/09
TRANSPORTATION MANAGER 2
SUITE 1000, JAMES K. POLK BUILDING

COMMENTS:

THIS TRAFFIC IS BASED ON 2008 CYCLE COUNTS AND THE PROPOSED S.R. 34 BRIDGE PROJECT PREPARED FOR DESIGN DATED 12-13-2005. THE FUTURE TRAFFIC IS BASED ON THE AVERAGE OF THE GROWTH RATES FROM THE BRISTOL MPO COMPUTER ASSIGNMENT MODEL.

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

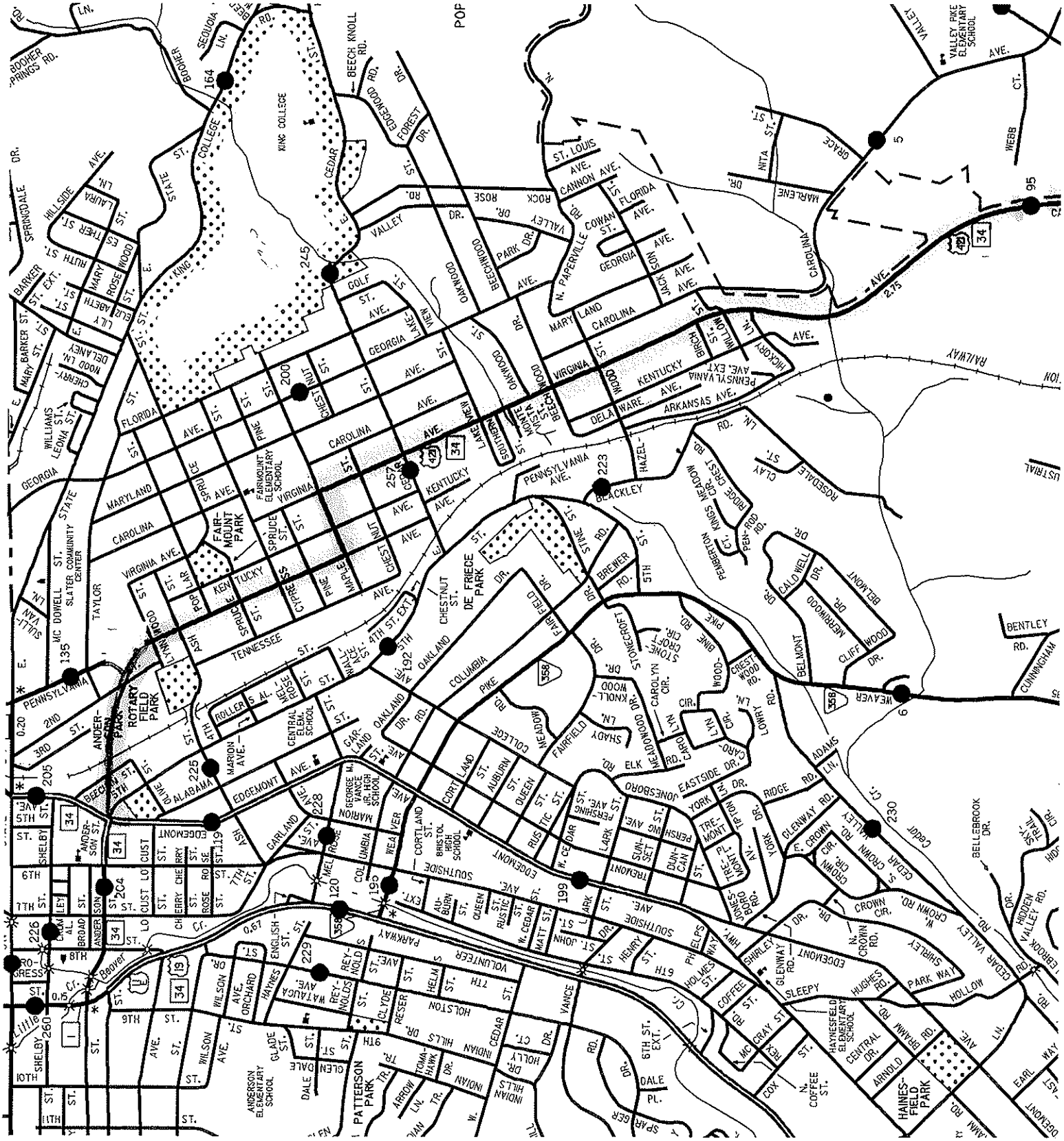
NOTE: FOR BRIDGE REPLACEMENT PROJECTS, ADLs ARE NOT REQUIRED FOR AADT's OF 1000 OR LESS AND PERCENTAGE OF TRUCKS OF 7% OR LESS.
SEE ATTACHMENTS FOR TURNING MOVEMENTS AND/OR OTHER DETAILS.

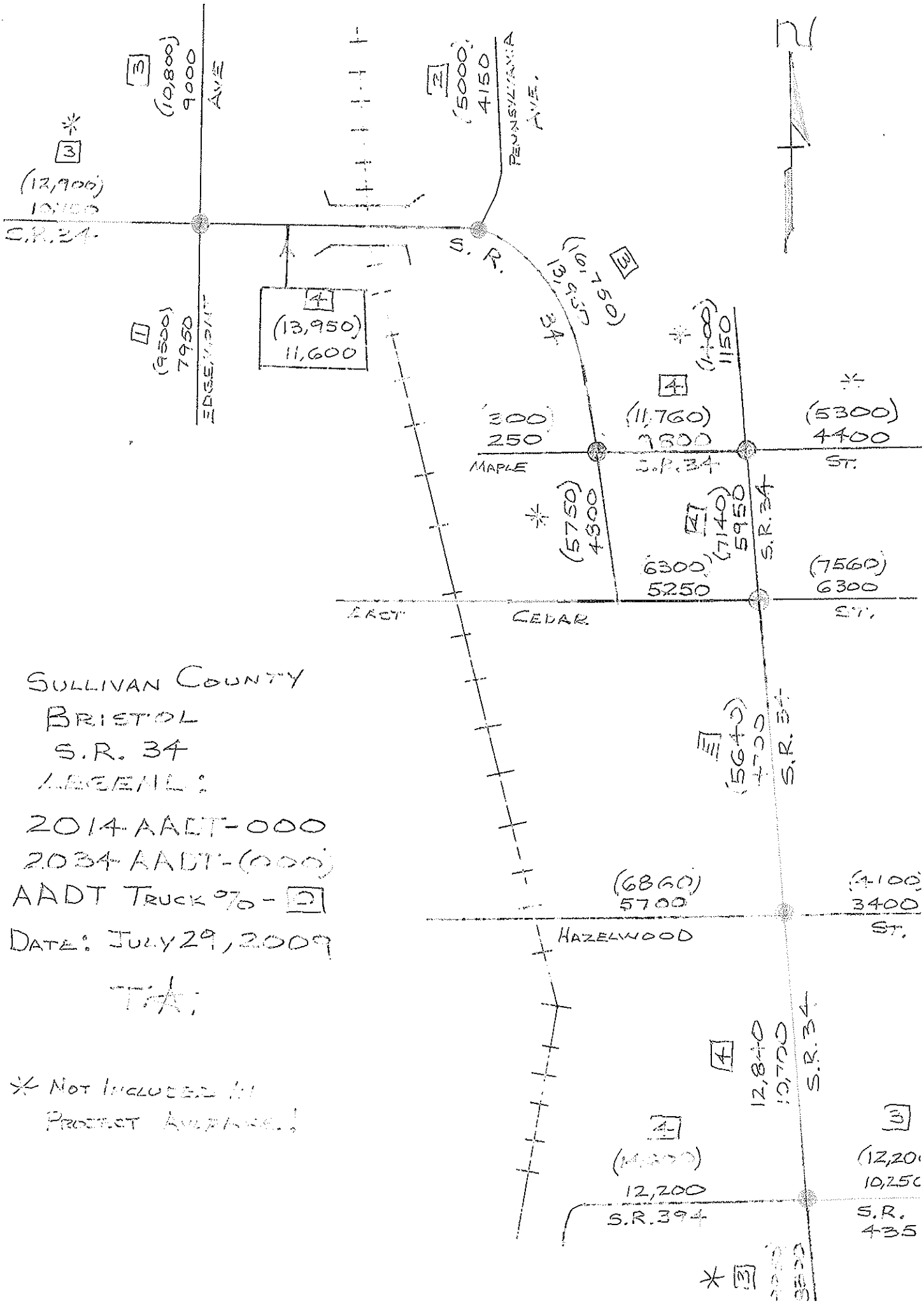
(REV. 9/20/07)

SULLIVAN COUNTY

BRISTOL

S.R. 34




SULLIVAN COUNTY
BRISTOL
S.R. 34
LEGEND:
2014 AADT-000
2034 AADT-(000)
AADT TRUCK % - 3
DATE: JULY 29, 2009
TIA:
* NOT INCLUDED IN PROJECT ANALYSIS
3 (10,800) 9000 AVE
2 (5000) 4150 PENNSYLVANIA AVE.
3 (12,900) 10,150 S.R. 34
4 (13,950) 11,600
1 (9500) 7950 EDGEMONT
S. R. 34
3 (16,750) 13,950
4 (11,760) 9800 S.R. 34
(1400) 1150
(300) 250 MAPLE
(5300) 4400 ST.
(5750) 4300
4 (7140) 5950 S.R. 34
6300 5250
(7560) 6300 ST.
EAST CEDAR
3 (5640) 4700 S.R. 34
(6860) 5700
(4100) 3400 ST.
HAZELWOOD
4 12,840 10,700 S.R. 34
4 12,200 S.R. 394
3 (12,200) 10,250 S.R. 435

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

Bureau of Environment and Planning
Project Planning Division

Field Review Notes

Region	County	Project Number	Type of Report
1	Sullivan Co	99108-7018-04	Transportation Planning Report (TPR)
Route Number and Termini			**Date of Field Review**
SR-34 (US-421) from SR-394 to Anderson Street			April 16, 2009 1:00PM EST

Team Members

Gena Gilliam	TDOT Planning	Planner III	615-253-7692	gena.gilliam@tn.gov
Andy Padgett	Region I Traffic	Op. Spec II	865-594-2456	andrew.padgett@tn.gov
Nathan Vatter	Region I Traffic	Op. Spec III	865-594-2456	nathan.vatter@tn.gov
Paul Lane	TDOT Planning	Trans. Manager I	615-253-2432	paul.lane@tn.gov
Jeff Turner	TDOT Design	Rdwy. Spec. Super I	865-594-2442	jeff.d.turner@tn.gov
David Metzger	City of Bristol	Traffic Engineer	423-989-5522	dmetzger@bristoltn.org
Mike Sparks	City of Bristol	Dep. City Manager	423-989-5516	msparks@bristoltn.org
Rex Montgomery	City of Bristol	Trans. Manager	423-989-5519	rmontgomery@bristoltn.org
Shari Brown	City of Bristol	Comm. Dev. Dir.	423-764-0343	sbrown@bristoltn.org
David Hacker	Essential Serv.	Supv. Electric Eng.	423-793-5548	dhacker@btes.net
Brian Reynolds	PB	Proj. Manager	615-340-9189	reynoldsb@pbworld.com

General Comments

- Team members met at the conference room at 104 8th Street, Bristol, TN 37621 before departing for a visual inspection and tour of the project corridor.
- Background project information and purpose and need were reviewed to determine improvements to the study corridor. The current *Bristol Urban Area Long-Range Transportation Plan Year 2030 Update* adopted in 2008 includes this project as a needed improvement consisting of widening to three lanes and realignment to eliminate the two 90-degree turns.
- The *Future Land Use Map* for the City of Bristol adopted August 2006 indicates a variety of land uses along the study corridor including both single and multi-family residential, industrial and commercial land uses.
- The *Base Map for Existing and Future City of Bristol Bicycle Routes* amended March 2009 identifies the study corridor as "Future Bicycle Route Southeast and Connectors".
- Existing aerial mapping and TRIMS data were reviewed for the study corridor. Many existing institutional land uses such as churches, schools and public housing were identified on the aerials.
- The design vehicle selected for improvements is a WB-50 truck.
- Potential locations for the direct connection between Pennsylvania Avenue and Virginia Avenue to eliminate the two 90-degree turns were reviewed.

- Shari Brown provided information and mapping regarding the Fairmount Neighborhood National Register Evaluation. The potential Fairmount Neighborhood National Register Historic District generally encompasses the SR-34 (US-421) study corridor from Anderson Street to approximately Maple Street.

Right-of-Way

- TRIMS data was reviewed for the corridor that shows ROW width varies from 44' to 62' wide and ultimately widens to 150' approaching SR-394.
- Subdivision Plats were provided by David Metzger. The area between Anderson Street and Hazelwood Street is shown on three recorded plats indicating the ROW of the existing SR-34 (US-421) (portions of Pennsylvania Avenue, Maple Street and Virginia Avenue) either indicated as 60' wide ROW or scaling to that dimension. The three plats are *Fairmount Land Company and Bristol Land and Improvement Company* (c. 1889), which covers from the northern end of the project to near Lakeview Street, *Holston Hall Addition* (c. 1941), which is a re-plat of the Virginia Avenue and Maple Street area, and *Lakeside Land and Improvement Company* (c. 1890), which covers from near Lakeview Street to south of Hazelwood Street.
- South of these three plats, SR-34 was built by TDOT to replace an older alignment c. 1960, and the plans for that project should be in TDOT archives.
- TDOT (Bill Hart) will be contacted regarding the ROW discrepancies within TRIMS and to confirm the ROW widths to be used for this study.

Alternatives

- Options for analysis and consideration include "No-Build", "Build-Alt-A", "Build-Alt-B" and "Enhanced No-Build". The build alternatives to provide the direct connection between Pennsylvania Avenue and Virginia Avenue were focused south of Maple Street to avoid or minimize potential impacts to the Historic District.
- Alternative A considered shifting the Maple Street connection between Pennsylvania Avenue and Virginia Avenue south to Chesnut Street and reducing the 90-degree turns by improving the horizontal curve radii. This location was visited by the team in the field and includes challenging topography. There is an existing vertical crest along Chesnut Street at Kentucky Avenue. Substantial earthwork (fill) would be required to reduce an existing sag curve and accommodate the horizontal curve from Chesnut Street to Virginia Avenue.
- Alternative B considered maintaining SR-34 (US-421) along the full length of Pennsylvania Avenue, crossing East Cedar Street near the 200' Railroad ROW and connecting back into Virginia Avenue near Lakeview Street. This location was likewise visited by the team in the field. The existing East Cedar Street at-grade railroad crossing experiences regular delays due to the active and heavily used rail line. Concern was expressed regarding the frequent blockage of East Cedar Street and storage length available for the potential relocated intersection. Numerous businesses along East Cedar Street were identified in the vicinity of the potential new intersection.
- The Enhanced No-Build option follows a Transportation Systems Management approach that includes numerous improvements to the corridor. This includes improving the horizontal curve radii at the existing 90-degree turns on Maple Street, considering 14' outside travel lanes instead of bike lanes to minimize ROW impacts within the historic district, providing continuous 5' sidewalks along the corridor and providing a left turn lane at Ash Street and Cedar Street instead of a continuous center turn lane.

Additional Field Observations

- Sidewalks are discontinuous just south of Poplar Street. There are many missing sidewalk segments and sections in disrepair.

- The Public Housing Authority section of the corridor extends between Hazelwood Street and Willow Street and includes on-street parking. There is no on-street parking north of Hazelwood Street or south of Willow Street.
- There is a large box culvert and Blue Line Stream crossing near Oakwood Street.
- The speed limit varies throughout the overall corridor and includes a minimum speed limit of 25 mph along the residential areas.
- Pine Street is the primary access to the Elementary School.
- Retaining walls are located along the west side of Pennsylvania Avenue north of Ash Street.
- Existing left turn lanes are provided at Hazelwood Street.
- Guardrail should be provided along the west side of SR-34 (US-421) south of Hickory Lane.
- The existing intersection of SR-34 (US-421) and SR-394 should be improved such that the left turning lanes are offset.

Additional Documentation Provided by City of Bristol

- GIS shape files of land data
- Virginia Avenue and Hazelwood Street Signalization Study
- Before-and-After Count Analysis, Anderson Street Bridge
- Crash Diagrams
- Crash Data – Critical Rate Factor Calculations

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:	October 27, 2009		
Evaluation done by:	Gena Gilliam		
	Transportation Planner 3		
County:	Sullivan		
Route:	State Route 34		
PIN:	112331.00		
Termini:	Anderson St to State Route 394		

Impact Ranking of Features Evaluated:	**Total by Rank**
Features with No Impact	**10**
Cemetery Sites & Cemetery Properties	
National Register Sites	
Terrestrial Species	
TDEC Conservation Sites & TDEC Scenic Waterways	
Superfund Sites	
Caves	
Pyritic Rock	
Tennessee Natural Areas Program	
Wildlife Management Areas	
TWRA Lakes & Other Public Lands	
Features with Low Impact	**1**
Aquatic Species	
Features with Moderate Impact	**1**

Railroads

Features with Substantial Impact **2**

Bat

Large Wetland Impacts

Community Impacts Present:

Institutions:

School

Church

Populations:

No population present

Linguistically isolated populations

Populations below poverty - State average- 13%

Populations below poverty - State average- 27%

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)	☑ **None** - No impact on the project as there are no known cemetery sites within or abutting the project study area or corridor. It is anticipated that a 'normal' effort 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)	☑ **Substantial** - A substantial impact on the project is probable as there is a known occurrence of Indiana or gray bats within 4 miles of the proposed transportation study area or corridor. It is anticipated that: a) avoidance/minimization of potential impacts to species will be needed, b) surveys for the species for the project may be required, c) coordination with USFWS and establish Section 7 biological conclusions for the project will be needed, and d) seasonal construction limitations will likely be necessary.

RAILROADS

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Moderate** – Medium impact on the project is anticipated as a railroad lies within the project study area or corridor. An impact on the railroad cannot be avoided through more detailed planning or the railroad will be within 200 feet of the proposed transportation project. The initial idea is that there will be an existing at-grade crossing, and coordination with the Tennessee DOT Safety Planning and Travel Data Office and the Tennessee DOT Right-Of-Way Division - Utilities Section should be initiated. An impact on the project is likely due to the need to resolve major drainage issues, grade crossing mitigation, grade separations, railroad property acquisition, and railroad relocations. Coordination with the railroad on right of way issues is anticipated which may require much time, including a maintenance agreement. Additional design effort to avoid/minimize impacts may be needed and to create additional alternatives. Maintenance agreements with the railroad may need to be resolved, and any maintenance will be dependent upon these agreements. Typical maintenance includes mowing and clearing of the right of way and/or repairs of signalized at-grade intersection.

Impacts Evaluated Within 2,000 Ft of Study Area

NATIONAL REGISTER SITES

Impact

Project Impact (Environmental, Time, Cost, Design, and Maintenance)	☑ **None** – No project impact is anticipated as there are no National Register listed properties abutting or within the project study area or corridor.

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)	☑ **None** – No project impact is anticipated. Pyritic rock is not known to occur in the study area/corridor or project does not involve excavation. Limestone (symbolized as dark green) and dolomite (symbolized as light green) are present.

TWRA LAKES & OTHER PUBLIC LANDS

Impact

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

Impacts Evaluated Within 4,000 Ft of Study Area

TERRESTRIAL 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 terrestrial species within the proposed transportation study area or corridor.

TDEC CONSERVATION SITES & TDEC SCENIC WATERWAYS

Impact

Project Impact (Environment, Time, Cost, Design, Maintenance)	☑ **None** – No project impact is expected as there are no scenic waterways or TDEC Conservation Sites within project study area or corridor.

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)	☑ **None** – No project impact is anticipated as a WMA does not abut nor is located within the project study area or corridor.

Impacts Evaluated Within 10,000 Ft of Study Area

AQUATIC SPECIES

Impact

Project Impact (Environment, Time, Cost, Design, and Maintenance)	☑ **Low** – Minimal impact on the project is likely as there is a known occurrence of a rare or state protected aquatic species located within the project study area or corridor. A survey for the species is likely to be required.

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 112331.00

1,000 Foot Corridor

Option: 112331_8201V01

Version Date: October 27, 2009

Created by: Gilliam

Cemetery Sites & Cemetery Properties

Cemeteries	None were found
Cemetery Property	None were found

Institutions & Sensitive Community Populations

Institutions: Total= 3

School	Tennessee Avenue Baptist Acade
Church	Virginia Avenue Baptist Church
Church	Tennessee Avenue Baptist Churc

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%	Present

Bat

Total= 1

	USESA	SPROT
Myotis grisescens	LE	E

Railroads

Present

EES Report

PIN 112331.00
2,000 Foot Corridor

Option: 112331_8201V01
Version Date: October 29, 2009
Created by: Jonathan Rogers

National Register Sites		None were found
Superfund Sites		None were found
Pyritic Rock	Classification	Total=
Pyritic Rock		None were found
TWRA Lakes & Other Public Lands		
TWRA Lakes		None were found
Other Public Lands		None were found

EES Report

PIN 112331.00

4,000 Foot Corridor

Option: 112331_8201V01

Version Date: October 27, 2009

Created by: Jonathan Rogers

Terrestrial Species — None were found

TDEC Conservation Sites & TDEC Scenic Waterways

TDEC Conservation Sites — None were found

TDEC Scenic Waterways — None were found

Large Wetland Impacts — **Total Acerage**= 2.33

0.64 acres

0.63 acres

1.06 acres

Tennessee Natural Areas Program — None were found

Wildlife Management Areas — None were found

EES Report

PIN 112331.00

10,000 Foot Corridor

Option: 112331_8201V01

Version Date: October 27, 2009

Created by: Jonathan Rogers

Aquatic Species — Total= 1 — USESA — SPROT

Phoxinus tennesseensis — D

Caves — None were found

TENNESSEE DEPARTMENT OF TRANSPORTATION
PROJECT PLANNING DIVISION
SAFETY PLANNING SECTION

CRASH DATA REQUEST

Requested by: Name: Gena Gilliam Date: 2/20/09
Division: Project Planning
Address: TDOT HQ Telephone No.: 253-7692
Project No.:
Location: Region: 1 County: Sullivan City: Bristol
Route: SR 34/ US 421
Location on Route: From Anderson Street to the SR 394 junction

Beginning Log Mile: 16.76 Ending Log Mile: 20.09

MAP SHOWING LOCATION MUST BE ATTACHED

TYPE OF CRASH DATA REQUESTED

	CHECK Yes	CHECK No	TIME PERIOD OR YEARS REQUESTED (3 Years or Specify) 2005	2006	2007	
Crash Listing:	☒	☐				
Collision Diagram:	☐	☐				
Crash Rates:	☐	☐				
High Hazard Rank:	☐	☐				
Update Previous Request:	☐	☐				
Special Request:	☐	☐				

Describe Specifics:

Request Analyzed By: Date: 4/29/09

Reviewed By: David Dollar Date: 5/8/09
David Dollar, Transportation Specialist 2

Harold Dilmore Date: 5/12/09
Harold Dilmore, Transportation Manager 1

Bill Anderson Date: 5/12/08
Bill Anderson, Transportation Manager 2

Comments: SR 34 Anderson St Ext was under construction from 2006 to June 2008
SR 34 lm 17.10 — 17.50

(REV. 09/05/06)

Crash Summary Report

Date: 04/28/2009

County: SULLIVAN **Route:** SR034 **Spcl Cse:** 0-NONE **Cnty Seq:** 1

Begin LogMile: 16.76 **End LogMile:** 17.1 **Begin Date:** 01/01/2005 **End Date:** 12/31/2007

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	1
Total Incap Injuries:	1
Other Injury Crashes:	3
Total Other Injuries:	4
Prop Damage Crashes:	32
Total Crashes:	36

Weather Conditions

No Adverse Conditions:	32	Sleet and Fog:	0
Rain:	2	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	0	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	1	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	0
Construction Zones:	0
Fixed Objects:	2
Heavy Trucks:	1
Bicycles:	0

Manner of Collision

Rear End:	10
Head On:	0
Rear-to-Rear:	0
Angle:	17
Sideswipe Same Dir:	4
Sideswipe Opp. Dir:	2
Unknown:	1

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	4
At Intersection:	32
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	0
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle in Transport:	34
Motor Vehicle in Transport in Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	2
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	1
Daylight:	32
Dusk:	0
Dark/Lighted:	3
Dark/Not Lighted:	0
Not Indicated:	0

Crash Summary Report

Date: 04/29/2009

County: SULLIVAN **Route:** SR034 **Spcl Cse:** 0-NONE **Cnty Seq:** 1

Begin LogMile: 17.11 **End LogMile:** 17.19 **Begin Date:** 01/01/2005 **End Date:** 12/31/2007

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	0
Total Incap Injuries:	0
Other Injury Crashes:	0
Total Other Injuries:	0
Prop Damage Crashes:	1
Total Crashes:	1

Weather Conditions

No Adverse Conditions:	0	Sleet and Fog:	0
Rain:	1	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	0	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	0
Construction Zones:	0
Fixed Objects:	0
Heavy Trucks:	0
Bicycles:	0

Manner of Collision

Rear End:	1
Head On:	0
Rear-to-Rear:	0
Angle:	0
Sideswipe Same Dir:	0
Sideswipe Opp. Dir:	0
Unknown:	0

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	0
At Intersection:	1
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	0
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle in Transport:	1
Motor Vehicle in Transport in Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	0
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	0
Daylight:	0
Dusk:	0
Dark/Lighted:	1
Dark/Not Lighted:	0
Not Indicated:	0

Section 2
SR 34 Anderson St
From 6th avenue to SR 473
Divided highway
not enough crashes for a rate.

Crash Summary Report

Date: 04/29/2009

County: SULLIVAN **Route:** SR034 **Spcl Cse:** 0-NONE **Cnty Seq:** 1

Begin LogMile: 17.2 **End LogMile:** 17.5 **Begin Date:** 01/01/2005 **End Date:** 12/31/2007

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	0
Total Incap Injuries:	0
Other Injury Crashes:	0
Total Other Injuries:	0
Prop Damage Crashes:	0
Total Crashes:	0

Weather Conditions

No Adverse Conditions:	0	Sleet and Fog:	0
Rain:	0	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	0	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	0
Construction Zones:	0
Fixed Objects:	0
Heavy Trucks:	0
Bicycles:	0

Manner of Collision

Rear End:	0
Head On:	0
Rear-to-Rear:	0
Angle:	0
Sideswipe Same Dir:	0
Sideswipe Opp. Dir:	0
Unknown:	0

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	0
At Intersection:	0
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	0
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	0
Other Animal:	0
Motor Vehicle in Transport:	0
Motor Vehicle in Transport in Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	0
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	0
Daylight:	0
Dusk:	0
Dark/Lighted:	0
Dark/Not Lighted:	0
Not Indicated:	0

SR 34 Anderson St extension
section 3
From SR 473 to Pennsylvania Ave
undivided highway
Not enough crashes for a rate.

Crash Summary Report

Date: 04/29/2009

County: SULLIVAN **Route:** SR034 **Spcl Cse:** 0-NONE **Cnty Seq:** 1

Begin LogMile: 17.51 **End LogMile:** 19.92 **Begin Date:** 01/01/2005 **End Date:** 12/31/2007

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	2
Total Incap Injuries:	4
Other Injury Crashes:	25
Total Other Injuries:	34
Prop Damage Crashes:	75
Total Crashes:	102

Weather Conditions

No Adverse Conditions:	87	Sleet and Fog:	0
Rain:	14	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	1	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	3
Construction Zones:	1
Fixed Objects:	5
Heavy Trucks:	4
Bicycles:	0

Manner of Collision

Rear End:	49
Head On:	5
Rear-to-Rear:	0
Angle:	32
Sideswipe Same Dir:	5
Sideswipe Opp. Dir:	3
Unknown:	1

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	1
Dry:	1
Other:	0
Unknown:	0

Crash Location

Along Roadway:	26
At Intersection:	76
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	0
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	2
Other Animal:	0
Motor Vehicle in Transport:	88
Motor Vehicle in Transport in Other Rdway:	1
Parked Motor Vehicle:	4
Other Type Non-Motorist:	0
Fixed Object:	5
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	1
Daylight:	83
Dusk:	2
Dark/Lighted:	10
Dark/Not Lighted:	5
Not Indicated:	1

Crash Summary Report

Date: 04/29/2009

County: SULLIVAN **Route:** SR034 **Spcl Cse:** 0-NONE **Cnty Seq:** 1

Begin LogMile: 19.93 **End LogMile:** 20.09 **Begin Date:** 01/01/2005 **End Date:** 12/31/2007

Statistics

Fatal Crashes:	0
Total Killed:	0
Incap Injury Crashes:	0
Total Incap Injuries:	0
Other Injury Crashes:	6
Total Other Injuries:	9
Prop Damage Crashes:	16
Total Crashes:	22

Weather Conditions

No Adverse Conditions:	20	Sleet and Fog:	0
Rain:	1	Smog, Smoke:	0
Sleet and Hail:	0	Severe Crosswind:	0
Snow:	1	Other:	0
Foggy:	0	Unknown:	0
Rain and Fog:	0	Blowing Sand, Soil, Dirt, or Snow:	0

Crashes Involving

Pedestrians:	0
Hazardous Cargo:	0
Construction Zones:	0
Fixed Objects:	2
Heavy Trucks:	1
Bicycles:	0

Manner of Collision

Rear End:	7
Head On:	0
Rear-to-Rear:	0
Angle:	10
Sideswipe Same Dir:	1
Sideswipe Opp. Dir:	0
Unknown:	0

Road Conditions

Ice:	0
Snow or Slush:	0
Sand, Mud, Dirt or Oil:	0
Wet:	0
Dry:	0
Other:	0
Unknown:	0

Crash Location

Along Roadway:	3
At Intersection:	18
Railroad Crossing:	0
Bridge:	0
Underpass:	0
Ramp:	1
Private Property:	0
Other:	0

First Harmful Event

Pedestrian:	0
Pedalcycle:	0
Railway Train:	0
Deer (Animal):	2
Other Animal:	0
Motor Vehicle in Transport:	18
Motor Vehicle in Transport in Other Rdway:	0
Parked Motor Vehicle:	0
Other Type Non-Motorist:	0
Fixed Object:	2
Other Object (not fixed):	0
Non Collision:	0

Lighting Conditions

Dawn:	0
Daylight:	19
Dusk:	1
Dark/Lighted:	2
Dark/Not Lighted:	0
Not Indicated:	0