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I. EXECUTIVE SUMMARY

In northeast Tennessee, Norfolk Southern (NS) operates three rail lines. One of the three lines is the NS main “A” Line, (Crescent Corridor) which operates through the towns of Morristown and Jefferson City. This main line averages 40 trains a day. The two other NS lines are secondary rail lines, “BL” and “S” Lines. The “BL” line operates mainly as a coal train route from northeast Tennessee to Asheville, NC. There are on average, eight trains per day operating on the “BL” Line. The “S” Line is a rail connection from the “A” Line to the “BL” Line traversing through the town of White Pine. This rail line operates on average 4 trains per day.

Due to the high volume of trains operating through Morristown (Hamblen County) and Jefferson City (Jefferson County), these towns, who are members of the Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) pursued conducting a Railroad Relocation Feasibility Study. This study analyzed the existing safety and traffic flow at road/rail crossings and identifying potential railroad relocation alignments in order to potentially relocate the rail line out of the downtown portion of Morristown. In addition, a site development review for potential Intermodal Freight Facilities was also performed as part of this study.



STV/Ralph Whitehead Associates (STV/RWA) completed a feasibility study to ascertain the viability of relocating the Norfolk Southern “A” Line and identified potential sites for an Intermodal Freight Facility. The STV/RWA project team began by assembling available information about the project area through existing data, literature reviews, field reviews, windshield surveys, mapping, and interviews and correspondence with various local and state officials. An alternate to relocating the Norfolk Southern rail line has been conceptualized including potential sites for the development of an Intermodal Freight Facility.

Rail is an essential component in the movement of freight throughout our country and our economy is highly dependant on it. Trucks move the majority of freight in our country but railroad transport is being seen as a more viable option in the transportation of goods from producer to consumer. The movement of freight by rail is becoming increasingly necessary with the rise of fuel prices and the congestion on our roads. Rail transport is also being viewed as a friendlier environmental mode as it helps to remove traffic from the roads, reduce congestion, and emit less pollution. This document has been completed to summarize the findings of the feasibility study and provide recommendations pertaining to the next steps in the Railroad Relocation Project and Intermodal Freight Facility.

II. PROPOSED PROJECT AND STUDY AREA DESCRIPTION

The Lakeway Area Metropolitan Transportation Planning Organization (LAMTPO) is located in northeast Tennessee and consists of Morristown, Jefferson City, White Pine, and portions of Jefferson and Hamblen Counties. The LAMTPO area was classified as an urbanized area by the United States Census Bureau in May of 2002 and has a population of approximately 54,000 and covers a land area of 45.41 square miles. The project area for this feasibility study consists of approximately 15 miles of Norfolk Southern Railroad running through the LAMPTO area and includes analysis of 87 road/rail crossings.



Downtown Jefferson City, TN

The LAMTPO area is located in northeast Tennessee approximately 50 miles east of Knoxville in the valley just north of the Great Smokey Mountains. The area has easy access to two major highways (25E and 11E) as well as convenient access to Interstates 40, 81 and 75. The area is located centrally within 250 miles of four major metropolitan cities: Nashville, TN, Atlanta, GA, Charlotte, NC, and Cincinnati, OH.

The area boasts beautiful lakes (Cherokee Lake and Douglas Lake), trails, and recreational opportunities and is located near three National Parks (Andrew Johnson National Historical Site, Cumberland Gap, and the Great Smokey Mountains). It has seen healthy industrial and business growth due to its location just east of Knoxville and its close proximity to rail and the interstate system. As a result, its residential growth is projected to grow consistently at the same 24% rate that is projected for the State of Tennessee by 2030. The University of Tennessee (UT) Center for Business and Economic Research predicts that both Hamblen and Jefferson combined will add another 10,000 people by the year 2020.

Major employers in the area include: Old Dominion Freight Company, Nashua Corporation, Berkline Furniture Corporation, Mahle, Colgate, Rich Foods and Koch Foods.

This project began with the review and documentation of existing railroad intersections within the study area. Rail relocation recommendations were analyzed for feasibility as was identifying new road/rail crossing locations along the relocation alignments, plus recommendations to certain existing road/rail crossings being affected by the potential rail relocation alignments in order to improve safety, lessen traffic congestion and improve the flow of traffic in the area at these road/rail crossings.

Also included in this project is a study of potential sites for an Intermodal Freight Facility. The LAMTPO area has convenient access to the interstate system and its location on the Norfolk Southern Crescent Corridor makes it a logical choice for the location for an Intermodal Facility. An intermodal facility involves the transportation of freight in a container or vehicle, using multiple modes of transportation without any handling of the freight itself when changing modes. The method reduces cargo handling, and so improves security and may allow freight to be transported faster. A key to this type of transport is that it can reduce the costs of transporting good via rail versus over road



Example of an intermodal facility

trucking. Access to rail and the interstate system are the two most important factors in locating an Intermodal Facility and its development would improve goods movement for the state and region. In addition, the development of an Intermodal Facility would also be a major economic boost for the area by creating jobs and stimulating new business.

III. PURPOSE AND NEED FOR THE PROJECT

The LAMTPO area has seen residential and business growth as well as increases in vehicle and train traffic. As a result, the potential for train-vehicle collisions has increased. According to the Federal Railroad Administration (FRA) 2007 statistics, there were a total of 2,728 crossing collisions in the United States resulting in 339 fatalities. The FRA also reported 71 road/rail crossing collisions in Tennessee in the year 2007. Over the past ten years within the study area, there were 30 road/rail crossing collisions resulting in seven injuries. This study and analysis was necessary to help make the determination to improve or eliminate the 87 crossings in the LAMTPO area or possibly relocate the rail line to improve public safety. Rail and vehicle traffic will naturally increase with growth in the area. The potential development of an Intermodal Facility (the second part of this study) in the LAMTPO area will also create a likely increase in train traffic and economic/job growth. With this growth there will be more residents and thus more vehicles on the road and a greater potential for vehicle/rail collisions. The development of an Intermodal Facility in this area makes the improvements/relocation of the road/rail crossings all the more important.



Downtown Morristown, TN

In addition to safety at crossings, the increases in vehicle and train traffic also impacts the quality of life of the people living and working in the area. When trains pass over roads the vehicular traffic is blocked until the train passes. Improvements to or elimination of the crossings can help traffic flow and improve emergency services, school bus transportation, business delivery and commuting. These factors all play a vital role in the quality of life in areas with rail running through them.

In an attempt to address transportation issues in the area, LAMTPO has developed a Unified Planning Work Program (UPWP) and well as a Long-Range Transportation Plan. These two plans serve to help address issues such as improving air quality, balancing the needs of different modes of travel and preventing/reducing traffic congestion.

The 15 miles of the Norfolk Southern rail running through the study area provides an important freight route from Louisiana to New Jersey. This rail segment is known as the Crescent Corridor and its runs along Interstate 81. Tennessee is seen as a vital conduit for freight by both rail and trucks and Norfolk Southern has plans to improve their Crescent Corridor between Louisiana and New Jersey. The State's freight system needs to become more intermodal and provide more efficient connections between air, water, truck and rail if it is going to compete in the global market. The development of an Intermodal Facility in the LAMTPO area would help improve transportation in the region and in the nation overall as it serves as a vital connector to the eastern seaboard as well as the northeast portion of the country.

The facility would serve as a freight hub where shipping containers could be loaded and off-loaded on trucks. Warehouse facilities would also be needed to provide storage.

Railroad transport was the primary mode of freight transport in the first half of the 20th Century. However, with the development of the Interstate System, deregulation of the Trucking Industry in the 1980s, and availability of cheap gas, trucking quickly took over the field of freight transport. Trucks have a constant presence on our roads and are a symbol of the American economy. An increase in the manufacturing of goods from Asia made freight transportation by trucks a key to the logistics of moving goods from producer to consumer. But gas costs have been at record highs during 2008 and the roads that these trucks must travel on are more congested.



Truck traffic near existing at-grade crossing

The trend of shipping large containers that can be delivered by boat into a port and then transferred by rail and trucks has become an increasing form of freight movement and has driven the demand for intermodal facilities. The conventional wisdom is that the preferred modal choice for the shipment of goods is rail over trucks. Rail is now seen to be more efficient than trucking and better for the environment due to the fact that it has a greater carrying capacity, is more fuel efficient and has cleaner emissions than trucks. Rail is also becoming faster and lighter with current technology and development.

Businesses and industry are becoming increasingly attracted to moving their freight by rail. The rail transit time is faster than truck transport and it has the potential to lower their shipping costs due to its efficiency. In addition, companies are looking to become more environmentally friendly by reducing fuel consumption and improving air quality. In fact, rail is known to be three times more fuel efficient than trucks and releases less pollutants into our air.

Another benefit to transferring the shipment of freight from trucks to rail is to alleviate the impact of large trucks on the interstate system. Taking trucks off the roads reduces traffic congestion on the roads and can reduce pavement damage. The movement of goods by large trucks is considered to be one of the primary causes of road damage throughout the country.

In the past few years, rail has seen an increase in business due to the increase of imported goods and the rising demand for coal. In fact, the American Association of State Highway and Transportation Officials report that rail freight movement will increase 60% by 2035. The National Surface Transportation Policy and Revenue Study Commission project that the total ton-miles of freight movement in this country is expected to increase 92% over the next 30 years.

Recognizing the importance of freight movement in this country, U.S. railroads have lobbied Congress to support tax-credit legislation to boost investments in rail. Unlike roads, there are no dedicated funding sources for freight rail facilities. The Freight Rail Infrastructure Capacity Expansion Act of 2007 has been proposed with bipartisan support. It is aimed at providing tax incentives to encourage investment in expansion of freight rail infrastructure. If passed, it would provide a 25% infrastructure tax credit for projects such as new track, grade separations, transfer yards, terminals and intermodal facilities. The

proposed bill is a sign that lawmakers understand the demand for rail facilities and recognize that funding rail infrastructure is a wise investment for this country.

The Tennessee Department (TDOT) recognized this need in their Long-Range Transportation Plan and suggests looking for opportunities to reduce freight travel on highways and divert it to rail in order to improve safety and relieve traffic congestion.

IV. EXISTING SOCIO-ECONOMIC CHARACTERISTICS

A. Regional Overview

The LAMTPO area is located in the northeastern valley of Tennessee between Knoxville and Bristol, TN. Its location just east of Knoxville makes it accessible to nine airports as well as the Tennessee river ports that link the region to the Gulf of Mexico and the Great Lakes. Its location along the Norfolk Southern Crescent Corridor and I-40/I-81 give it a vital link to the Eastern seaboard and the entire northeast section of the country.

B. Population Trends

The state of Tennessee saw significant growth in the last decade of the Twentieth Century. The LAMTPO area also saw a similar increase. Hamblen and Jefferson Counties saw a combined increase of 26.6% in the period from 1970-1980 at a slightly higher rate than the State of Tennessee's population increase of 17% for the same period. Economic downturn in the 1980s was reflected by single digit percentage population increases for Tennessee and the two counties. As the economy rebounded during the 90s the state and the region saw record population increases.

The Tennessee Department of Transportation (TDOT) Long Range Transportation Plan (2005) projects the greatest population growth to occur in the Nashville area with higher growth pockets projected for eastern Tennessee along I-75 and I-40. The plan also details a 30 percent population growth for the state by 2030 and an employment increase of 40 percent by the same year.

Table 1 summarizes the population trends between 1960 and 2000 for Hamblen and Jefferson Counties as well as for the state of Tennessee. **Table 2** summarizes the population projections for Hamblen and Jefferson Counties through the year 2025.

Table 1. REGIONAL POPULATION TRENDS 1960 – 2000

Year	Hamblen County	Jefferson County	Combined Counties	Tennessee
1960	33,092	21,493	54,585	3,567,089
% Change 1960-1970	16.7%	16%	16.6%	10%
1970	38,696	24,940	63,636	3,923,687
% Change 1970-1980	27.4%	25.4%	26.6%	17%
1980	49,300	31,284	80,584	4,591,120
% Change 1980-1990	2.4%	5.5%	3.61%	6.23%
1990	50,480	33,016	83,496	4,877,185
% Change 1990-2000	15.2%	34.2%	22.7%	16.65%
2000	58,128	44,294	102,422	5,689,283

* SOURCE: U.S. Census 1960 – 2000

Table 2. REGIONAL POPULATION PROJECTIONS: Region

	Population 2000	Population 2025	Increase % Change
Hamblen County	58,128	76,938	32.4 %
Jefferson County	44,294	65,928	48.8 %
Jefferson City	7,760	10,654	37.3 %
Morristown City	24,965	32,932	31.9 %
Town of White Pine	1,997	2,822	41.3 %
Combined (Hamblen and Jefferson) Counties	102,422	142,866	39.5 %
Tennessee State	5,689,283	7,559,532	32.9 %

* SOURCE: SOURCE: U.S. Census 2000-2025

C. Local Economy and Labor Force

The LAMTPO region historically has had an agricultural based economy. However, manufacturing has become the predominate industry. The educational attainment for the labor pool in the LAMTPO region is slightly lower than the state average and the median family incomes and per capita incomes are also slightly lower than the state and national averages. The following **Tables 3 through 6** detail statistics on industry, education, employment status, and income for Hamblen County, Jefferson County, Jefferson City, Morristown City, White Pine Town, and the state of Tennessee.

Table 3. REGIONAL DATA: 2000 Industry

	Hamblen County	Jefferson County	Jefferson City	Morristown City	White Pine Town	Tennessee State
Total Population	58,128	44,294	7,760	24,965	1,997	5,689,283
Agricultural, forestry, fishing, hunting, mining	1.2% (326)	2.8% (571)	2.1% (69)	1.3% (140)	1.5% (12)	1.4% (36,051)
Construction	5.7% (1,574)	8.3% (1,710)	6.0% (196)	5.6% (620)	10.2% (81)	7.3% (193,255)
Manufacturing	36% (9,886)	23.3% (4,822)	20.3% (657)	36.7% (4,071)	24.7% (197)	18.9% (501,836)
Wholesale trade	3.7% (1,007)	2.9% (607)	1.1% (37)	3.6% (403)	5.8% (46)	3.8% (101,183)
Retail trade	12.1% (3,319)	12.0% (2,470)	11.2% (363)	11.2% (1,243)	13.9% (111)	11.8% (312,992)
Transportation, warehousing, utilities	4.4% (1,198)	6.2% (1,290)	4.7% (153)	3.9% (430)	6.7% (53)	6.3% (166,144)
Information	1.2% (323)	1.5% (316)	2.0% (65)	1.3% (140)	- (-)	2.4% (63,200)
Finance, insurance, real estate, rental, leasing	4.0% (1,089)	4.1% (856)	3.5% (115)	4.2% (464)	2.3% (18)	5.8% (153,323)
Professional, scientific, management, administrative, waste management services	3.8% (1,034)	4.6% (948)	4.2% (136)	4.5% (502)	5.7% (45)	7.4% (196,702)
Educational, health, social services	15.0% (4,106)	17.9% (3,693)	30.2% (980)	13.3% (1,481)	16.5% (131)	18.6% (493,673)
Arts, entertainment, recreation, accommodation, food services	5.8% (1,604)	8.3% (1,720)	8.1% (261)	7.9% (872)	4.1% (33)	7.5% (199,260)
Public administration	2.6% (702)	3.5% (726)	0.5% (16)	2.3% (252)	1.9% (15)	4.0% (105,951)

* SOURCE: U.S. Census 2000

- Represents zero or rounds to zero

Table 4. REGIONAL DATA: 2000 Educational Attainment for Age 25 and Over

	Hamblen County	Jefferson County	Jefferson City	Morristown City	White Pine Town	Tennessee State
Total Population	58,128	44,294	7,760	24,965	1,997	5,689,283
Percent high school graduate or higher	69.3%	71.0%	66.2%	64.5%	62.4%	75.9%
Percent bachelor's degree of higher	13.3%	12.8%	17.7%	13.6%	3.0%	19.6%

* SOURCE: U.S. Census 2000

Table 5. REGIONAL DATA: 2000 Employment Status

	Hamblen County	Jefferson County	Jefferson City	Morristown City	White Pine Town	Tennessee State
Total Population	58,128	44,294	7,760	24,965	1,997	5,689,283
Population 16 and over	46,240	35,276	6,397	20,297	1,543	4,445,909
Percent In labor force	62.0%	62.0%	56.4%	57.7%	55.5%	63.5%
Percent Not in labor force	38.0%	38%	43.6%	42.3%	44.5%	36.5%
Percent Employed	59.3%	58.6%	50.7%	54.7%	45.6%	59.6%
Percent Unemployed	2.6%	3.4%	5.7%	2.9%	4.0%	3.5%

* SOURCE: U.S. Census 2000

Table 6. REGIONAL DATA: 2000 Income Levels

	Hamblen County	Jefferson County	Jefferson City	Morristown City	White Pine Town	Tennessee State
Total Population	58,128	44,294	7,760	24,965	1,997	5,689,283
Median Family Income (dollars)	39,138	38,537	33,964	33,391	31,464	43,517
Per Capita Income (dollars)	17,743	16,841	13,770	15,894	12,605	19,393

* SOURCE: U.S. Census 2000

V. EXISTING ENVIRONMENTAL CHARACTERISTICS

The study area consists of rolling hills, valleys, ridges, floodplains, numerous streams, rivers and lakes, farmland, and potential hazardous underground storage tanks. Along the French River, there is a large area of identified floodplains, as well as upstream along many of its tributaries. FEMA files were obtained to identify where floodplains and floodways were identified within the study area.

VI. ALTERNATES CONSIDERED

A. Alignment Alternatives

In order to relocate the rail service along a portion of the Norfolk Southern “A” Line, various alternative alignments were evaluated. Alternative alignments were identified along the eastern portion of Hamblen County, generally paralleling the NS “BL” Line. Reasons behind investigating alignment options within this area was due to the potential ability to utilize a portion of the “BL” Line, as well as to the northwest of Morristown lies Lake Cherokee, which would be an environmental constraint. Potential intermodal sites were also identified along the alternative alignments.

During the analysis and identification of the ability to relocate the main rail line (NS “A” Line) away from downtown Morristown, it was identified that two additional rail lines were deemed necessary in order to continue to serve existing rail customers: a new connection to the Eastern Industrial Park and a new wye connection at Bulls Gap. A new service line to the industrial park would need to be constructed so that the train operations would not have to change directions at the existing siding track location (far southern portion of the industrial park). A new service line would provide smoother service to serve those industries located in the industrial park. The new wye connection was needed in order to enhance the rail operations if the Norfolk Southern “A” Line were to be relocated/abandoned. Appendix “A” depicts the following descriptions of the alternative alignment and intermodal site options.

Norfolk Southern “A” Main Line Relocation Alternative Alignments

Alternative –V1

Two alternative alignments were originally identified during the analysis phase. Alternative –V1 utilized a short segment of the existing NC “BL” Line from Bulls Gap heading south. Just prior to the “BL” rail line crossing under I-81, L1 begins to taper off, utilizing the existing bridge structure, and making a sharper curve in order to swing up and parallel I-81 along the eastern side. V1 splits between I-81 and an existing quarry. Just south of the quarry and crossing over TN 160, over 24,000’ of tangent rail line is provided for intermodal alternative V1. After the intermodal site, there is a wye to allow the trains to either head south towards Asheville, NC (also eventually tying into the NS “S” Line) or head west towards Morristown to reconnect to the NS “A” Line. The rail line connection to the south eventually ties into the existing NS “BL” Line east of the town of White Pine, approximately 2000’ feet prior to the existing “S” Line/“BL” Line connection. The V1 alignment heading west toward Morristown crosses under US 25 and I-81, where intermodal alternative V3 is located. The alignment then weaves through valleys and parallels Alpha Valley Home Road towards TN 160 to eventually tie into the NS “A” Line just south of TN 160, with a wye connection to the NS “A” Line heading north to provide rail service to a few industrial sites near the Morristown airport.

The V1 alternative alignment was designed to construct two main tracks, with the ability to eventually expand to four tracks. The right-of-way identified takes into account the width needed to accommodate the additional tracks. Since the alternative weaves through valleys and ridges, there are a number of areas where large cut and fill is needed. Plus, due to the design limitations, there are also various locations where numerous properties are impacted due to the grade and curve restrictions on rail designs. Along V1, two to three new at-grades would be required but 24 new grade separated crossings would be created.

Grade separated crossings not only improve the safety of the trains and vehicles, a majority of the grade separated crossings were dictated by the topography of the corridor. This alternative alignment would also require 22.17 miles of new double track, along with adding 5.4 miles of track along the existing NS “BL” Line in order for that section to be double track (such as is the existing case with the NS “A” Line).

The V1 alignment would abandon the entire NS “S” Line and approximately 10 miles of the NS “BL” Line. It would also abandon approximately 16 miles of the existing NS “A” Line. In addition, approximately 26 existing at-grade rail crossings along the NS “A” Line, eight at-grade crossings along the NS “BL” Line and all 17 at-grade crossings along the NS “S” Line would be eliminated.

Alternative –V2

Alternative –V2 was identified early on through the process. However, throughout the design process, various design obstacles prevented the alternative alignment from adhering to the design criteria. One critical location was where the relocated NS “A” Line would spur off of the existing NS “BL” Line near River Road and Leepers Ferry Road. There is an excessive elevation change within a short distance near the river. Since the existing NS “BL” Line elevation is approximately 1100’, 5.8 miles of a constant 1% max slope would be required in order to meet existing ground elevation, which would end up near route TN 66. Norfolk Southern design requirements prevent a continuous 1% slope for 284 feet. If this design requirement is implemented into the design, the alignment would not match existing grade for another few miles in order to take into account periods of a 0% slope in between the 1% slopes. The alignment utilizes the same portion of V1 from I-81 towards Morristown. In addition, by having a very long stretch of 1% slope, there is an extensive amount of cut required along the corridor, which not only exasperates the construction cost, but also the amount of land impacted from a right-of-way and relocation standpoint.

Since obstacles prevent the alignment from spurring off the NS “BL” Line, this entire alternative was eliminated from consideration.

Norfolk Southern “A” Main Line Eastern Industrial Park Connection

Three alternatives were developed in order to provide rail access to the Eastern Industrial Park. Currently, rail customers are served via a siding track on the southern portion of the industrial park. By relocating the NS “A” Line, there is a greater benefit to closing four existing at-grade crossings (3 along US 11 and 1 along Morris Boulevard) as well as relocating the siding track in order for the train (heading from the north) to have to reverse direction into the industrial park. By constructing a new siding track that enters the industrial park from the north, there would not be any issues from a train operations stand point.

Three alternatives were created to provide rail service into the Eastern Industrial Park, V1, V2 and V3. V1 is the shortest in length of the three alternatives. This alternative alignment utilizes as much of the NS “A” Line as possible, as well as relocates the at-grade crossing on Warrensburg Road slightly to the east. The problem with that is that the existing Warrensburg Road at-grade crossing is a hump crossing with very poor sight distance and elevation change. This would be the case if alternative V1 was utilized. Another issue would be that an existing residential home would be raised. In addition, as the new siding track ties into the existing siding track within the industrial park, it could potentially impact the existing business, or at least disrupt their parking and driveway movements.

V2 is slightly longer than V1 and would relocate Warrensburg Roads at-grade crossing further east; however this alignment alternative could potentially disturb two residential properties, or at least their driveway access onto Warrensburg Road. V2 would also have the same issue in respect to tying into the existing siding track and potentially disrupting the traffic movements of the existing business.

Even though V3 is the longest of the three options, it has the least engineering issues associated with the alignment. The alignment would not affect residential access onto Warrensburg Road, the relocated at-grade crossing would not be a hump crossing and the alignment ties into the existing siding track without disrupting the existing business.

Norfolk Southern Bulls Gap Wye Connection

Bulls Gap is a small rail yard that provides the ability to switch trains and cars. Currently, train movements from the Greeneville, TN area heading onto the NS “BL” Line are required to enter the Bulls Gap yard and switch directions. There is no direct wye connection heading south from the NS “A” to the “BL” Line. From an operations stand point, a new wye connection would be needed if the NS “BL” Line becomes the main line so that train movements would not need to head into the Bulls Gap yard to switch. Three alternatives were investigated in order to provide direct access onto the NS “BL” Line, V1, V2 and V3. Appendix ‘B’ depicts the existing and proposed rail operations diagram.

V1 and V2 are shorter alignment options; however both of these options have topography and elevation issues in providing a tie into the existing NS “A” Line. Due to the radius of the curve and grade of the potential tracks, it is not possible to tie into the existing NS “A” Line utilizing Norfolk Southern’s design criteria.

The V3 option radius is much less than V1 and V2, plus the tie into the existing NS “A” Line is further east where the elevations are more conducive. All three options would require the existing White Horn Creek Road at-grade crossing to be relocated further east as well as require a stream crossing.

Norfolk Southern “A” Main Line East Tennessee Progress Center Connection

The East Tennessee Progress Center currently houses two industrial businesses that utilize rail service. The progress center is located west of US 25 and north of I-81 at Exit 8 of I-81. In order to provide rail service to these two locations, and for future rail service to potential businesses within the progress center, a siding track would be required along the relocated NS “A” Line near Howard Allen Road with a spur line connecting the siding track with the existing NS “S” Line just north of I-81. The siding track would be required in order for the trains to switch direction and enter the progress center in a reverse direction f traveling from Jefferson City. If trains are heading from the Bulls Gap area, they would enter into the siding track in order to enter in reverse direction. Trains will need to enter the progress center in a reverse direction since there would be no ability for the train engines to turn around.

B. Intermodal Site Alternatives

Intermodal Site V1

Intermodal Site V1 is a feasible option and is located adjacent to I-81 and in between TN 160 and US 25. The yard site is located at Station 599+40.00 – 669+40.00 along track alignment L1. Station 529+40.00 and Station 739+40.00 are the location of the 7000 feet of track needed in and out of the yard.

V1 causes some conflicts with existing features. Specifically, V1 comes in conflict with two existing roads (Buell Chapel Road, which comes up through the yard, and St. Paul Road, which runs parallel to the yard). Hence, approximately 14,250 feet of new road would be needed and three dead ends would need to be created on the existing roads where access would be cut off (at Old Lowland Road, St. Paul Road, and Buell Chapel Road). Also, four grade separated crossings would be needed in between the track entering or leaving the intermodal yard and the existing roads (TN 160, St. Paul Road, Spencer Hale Road, and Old White Pine Road). Two bridges would be needed as well to span two creek crossings (one crossing is north east of TN 160, the other is southwest of Spencer Hale Road).

The eastern corner of the intermodal yard is in the 100-year floodplain. With the rough grade that was determined for the intermodal yard, approximately 100 feet of fill would be needed here. There is room to complete the fill work prior to entering the floodway; therefore the river will see no change in water surface elevation in the 100-year storm event.

Intermodal Site V2

Intermodal Site V2 was explored, but it was determined to not be a feasible option due to its close proximity to an existing quarry near track alignment L2. Also, track alignment L2, as mentioned previously, could not adhere to the design criteria.

Intermodal Site V3

Intermodal Site V3 is a feasible option and is located west of the intersection of I-81 and US 25. The yard site is located at Station 375+40.00 – 445+40.00 along track alignment L1. Station 305+40.00 and Station 515+40.00 are the location of the 7,000 feet of track needed in and out of the yard.

V3 causes some conflicts with existing features. Specifically, V3 comes in conflict with three existing roads (McClanahan Road on the west side of the yard and Witt Road and Howard Allen Road on the east side of the yard). Hence, eight dead ends would need to be created on the existing roads where access would be cut off (at Interstate View, Witt Road, Howard Allen Road, Primrose Court, and McClanahan Road), or the roadways would need to be re-aligned to provide alternative connections. Also, two grade separated crossings would be needed in between the track entering or leaving the intermodal yard and the existing roads (North White Pine Road and Hardy Road). There are a few stream crossings to contend with, along with two potential floodplain areas within this option. In addition, the topography consists of rolling hills and is located in the heart of the East Tennessee Progress Center. This site created a number of design issues, from the floodplains to the topography and the lead tracks entering into the intermodal site do not meet the Norfolk Southern design criteria of 7,000 feet of tangent track.

VII. CONFLICTS AND HAZARDS

A. Existing Conditions

The existing Norfolk Southern (NS) rail lines traversing through Jefferson and Hamblen County have 107 roadway crossings, with multiple types of safety measures with 18 of these being grade separated. Over the past ten years, there have been 31 accidents at the numerous roadway crossings. There is an average of 45 trains traveling along the NS “A” Line, which is the main rail line traversing through downtown Jefferson City, Morristown, Jefferson and Hamblen County. The other two NS lines, the “BL” and “S” lines have an average of 10 trains traveling through the Town of White Pine, Jefferson and Hamblen County.

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B. Proposed alternatives

Under both alternatives, numerous conflicts and hazards would be eliminated to vehicles currently navigating at-grade crossings and stopped trains. The proposed rail relocation would improve safety, improve traffic flow, improve access to businesses, residential neighborhoods, and improve emergency response within the City of Morristown, along the existing NS “S” Line, within the Town of White Pine, and along a portion of the NS “BL” Line. However, the alternatives create new at-grade crossings, which would need to have any and all safety measures installed to ensure that they are as safe as possible for vehicular traffic. This is especially important since these areas have not had to deal with railroad crossings and there would be a new learning curve in understanding the safe steps needed when approaching at-grade crossings.

Table 7 defines the newly identified grade crossings along Alternative V1 and V2.

Table 7 – Potential Grade Crossing Improvements

ID	STREET CROSSING	CROSSING TYPE	PROPOSED WARNING DEVICES
A	Dearing Road	At-Grade	Signals, Lights & Gates
B	Brogan Road	Grade Separated	Roadway over proposed rail alignment
C	Pleasant Ridge Road	Grade Separated	Roadway over proposed rail alignment
D	Valley Horne Road	At-Grade	Signals, Lights & Gates
E	Hardy Road	Grade Separated	Roadway over proposed rail alignment
F	McClanahan Road*	Grade Separated	Rail alignment over roadway
G	Howard Allen Road*	Grade Separated	Rail alignment over roadway
H	Witts Foundry Road*	Grade Separated	Rail alignment over roadway
I	Interstate 81	Grade Separated	Rail alignment over roadway
J	US 25E	Grade Separated	Roadway over proposed rail alignment
K	Honeysuckle Street	Grade Separated	Rail alignment over roadway
L	Old White Pine Road	Grade Separated	Rail alignment over roadway
M	Spencer Hale Road	Grade Separated	Rail alignment over roadway
N	St. Paul Road**	At-Grade	Signals, Lights & Gates
O	Langdon Road/St. Paul Road	Grade Separated	Rail alignment over roadway
P	Old Lowland Road	Grade Separated	Rail alignment over roadway
Q	SR 160	Grade Separated	Rail alignment over roadway
R	Stream Crossing	Grade Separated	Rail alignment over stream

S	McClister Road	Grade Separated	Roadway over proposed rail alignment
T	Chucky River Road	Grade Separated	Rail alignment over roadway
U	Fish Hatchery Road	Grade Separated	Rail alignment over roadway
AA	Honeysuckle Street	Grade Separated	Rail alignment over roadway
AB/BB	Stream Crossing	Grade Separated	Rail alignment over stream
AC/BA	Enka Road	Grade Separated	Roadway over proposed rail alignment
AD	Powers Road	Grade Separated	Rail alignment over roadway
BC	Old White Pine Road	Grade Separated	Rail alignment over roadway
Y2C-B	Stream Crossing	Grade Separated	Rail alignment over stream

Depending on which intermodal site is recommended, there are a few structure differences. If Intermodal site V3 is selected, the three structures with an “*” next to the name would not be required, however, those three streets would either need to be realigned or become dead end streets. Under either intermodal site scenario, portions of St. Paul Street “**” would also need to be realigned. In addition, if intermodal site V1 is selected, St. Paul Street may be required to be relocated in order to eliminate the potential at-grade crossing since Norfolk Southern prefers all tracks leading into and out of intermodal yards to be grade separated from any nearby/perpendicular streets.

One other road realignment will be required throughout the corridor in order to accompany the rail realignment, Baker Springs Road. The existing White Horn Creek Road at-grade crossing would need to be relocated approximately 100’ to the east.

VIII. COST ESTIMATES

Using the alignment options for each alternate route, approximate quantities and preliminary costs were developed for the construction of each proposed alternate. Approximate cut/fill boundaries were also produced utilizing the topography provided and alignment design. The preliminary construction costs were conducted utilizing 2008 dollars and include a 20% contingency, as shown in **Table 8**.

Costs were not conducted for the intermodal site locations since the actual layout was not designed nor determined during this study process.

Constructing rail relocation alignment V1 and the Bulls Gap wye connection (which would improve operations significantly) and incorporating intermodal site V1, the estimated cost would be approximately \$319,500,000. By constructing rail relocation alignment V1 and the Bulls Gap wye connection and incorporating intermodal site V3, the estimated cost would be approximately \$292,500,000. The difference in the cost is due to the additional grade separated crossings that would be required for rail alignment V1. Under Alignment V1 utilizing intermodal site V1, McClanahan Road, Howard Allen Road

and Witts Foundary Road would be grade separated. However, utilizing intermodal site V3, these three roads would need to be realigned or become dead end streets in order to account for the intermodal site.

The estimated \$319 Million project cost does not include the cost of removing the existing NS track from the potential abandoned right-of-way, the cost of abandoned NS right-of-way, or the cost of fiber optic protection/relocation. The removal of the existing track may be accomplished by different contracting means depending on the agreement between the TDOT, Hamblen County, the Town of Morristown, and Norfolk Southern. The disposition of the abandoned right-of-way will also depend on the agreement between TDOT, Hamblen County, the Town of Morristown, and Norfolk Southern.

Table 8 – Preliminary Magnitude of Cost

Estimated Construction Cost				
	Relocated L1 Line w/ Intermodal Site V1	Relocated L1 Line w/ Intermodal Site V3	Industrial Park V3	Bulls Gap V3
Mobilization & Grading	\$10,042,366	\$9,146,366	\$493,014	\$130,637
Unclassified Excavation	\$45,671,828	\$45,671,828	\$2,017,193	\$107,946
Unclassified Borrow	\$28,952,193	\$28,952,193	\$3,763,722	\$304,336
Stone Ballast (l)	\$3,693,162	\$3,693,162	\$142,398	\$70,163
Sub-Ballast (l)	\$9,407,434	\$9,407,434	\$184,421	\$378,300
New Track Construction (m)	\$31,877,400	\$31,877,400	\$1,211,550	\$597,000
New additional track (to make a double track)	\$4,276,800	\$4,276,800	\$0	\$0
Grade Separation - Highway & Rail Bridges (i)	\$76,968,500	\$59,048,500	\$2,541,000	\$1,155,000
Culverts - Stream Crossing (k)	\$1,225,000	\$1,225,000	\$175,000	\$0
New at-grade warning devices (j)	\$480,000	\$480,000	\$0	\$0
Upgrade existing at-grade warning devices (g)	\$800,000	\$800,000	\$0	\$0
New Rail Turnouts (6 locations) (n)	\$360,000	\$360,000	\$0	\$0
Subtotal - Construction	\$213,754,682	\$194,938,682	\$10,528,297	\$2,743,382
Acres	421.6	421.6	30.8	7.1
Right-of-Way (f)	\$6,324,000	\$6,324,000	\$462,000	\$106,500
Planning, Design & Construction Engineering	\$42,750,936	\$38,987,736	\$2,105,659	\$548,676
Total Estimated Cost	\$262,831,000	\$240,251,000	\$13,096,000	\$3,399,000
Total Estimated Cost with a 20% Contingency	\$315,397,200	\$288,301,200	\$15,715,200	\$4,078,800
Design Criteria:	1% grade, 2:1 side slopes	1% grade, 2:1 side slopes	1% grade, 2:1 side slopes	1% grade, 2:1 side slopes
Notes:	* Planning, Design & Construction Engineering is 20% of the Subtotal Construction costs * ROW and bridge structures cost estimates incorporated a 4 track rail corridor (as noted by Norfolk Southern), but construction of new track only accounted for double tracks since this is what currently exists along the NS "A" Line (22' wide bridge at \$350 sf) * Total Estimated Cost does not account for cost of relocating road, roadway structures, and relocating buildings. * Cost estimates are in 2008 US dollars (f) - assumed an average of \$15,000 per acre (g) - 5 existing at-grade crossings along the "BL" would need the warning devices upgraded to account for the additional track (i) - if Intermodal site V3 is chosen, 3 bridge structures would be eliminated since they would need to be relocated due to intermodal site (j) - assumes new warning devices would cost \$160,000 a piece (k) - assumes an average of \$35,000 per culvert (l) - assumes \$20 a ton for ballast (m) - assumes \$150 per foot per new track (n) - assumes \$60,000 per rail turnout			

Cost savings options

Due to the high cost of the rail realignment project, mainly due to the topography and need to maintain the design criteria requirements, alternatives were investigated in how to reduce the overall costs. A possible way to reduce the cost of the overall project would be to discuss with Norfolk Southern about providing design criteria exceptions. Costs for mobilization, grading, excavation, borrowing could be reduced if Norfolk Southern would allow a design exception of a 1.5% track grade and/or a 1.5:1 side slope within rock cuts (utilizing such alternative measures as geo-graphics/fabrics) along the entire corridor. This could potentially reduce the cost of the overall project by approximately 20%. The other items included in the cost of the project, such as ballast, rail, grade separations, culverts, warning devices, and rail turnouts would not be affected by the design criteria exceptions. However, by reducing the cost

by approximately 20%, that is a significant savings in respect to the overall cost of relocating the NS “A” Line out of an urban area, as shown in **Table 9**. Further refinement of the project costs can be made through the progression of the planning, design and agreement process for the project.

Table 9 – Preliminary Magnitude of Cost utilizing Design Criteria Exceptions

Estimated Construction Costs with Design Criteria modifications				
	Relocated L1 Line w/ Intermodal Site V1	Relocated L1 Line w/ Intermodal Site V1	Industrial Park V3	Bulls Gap V3
Mobilization & Grading	\$8,203,966	\$7,883,222	\$493,014	\$130,637
Unclassified Excavation	\$26,476,092	\$21,756,443	\$2,017,193	\$107,946
Unclassified Borrow	\$11,379,928	\$9,684,696	\$3,763,722	\$304,336
Stone Ballast (l)	\$3,693,162	\$3,693,162	\$142,398	\$70,163
Sub-Ballast (l)	\$9,407,434	\$9,407,434	\$184,421	\$378,300
New Track Construction (m)	\$31,877,400	\$31,877,400	\$1,211,550	\$597,000
New additional track (to make a double track)	\$4,276,800	\$4,276,800	\$0	\$0
Grade Separation - Highway & Rail Bridges (i)	\$76,968,500	\$76,968,500	\$2,541,000	\$1,155,000
Culverts - Stream Crossing (k)	\$1,225,000	\$1,225,000	\$175,000	\$0
New at-grade warning devices (j)	\$480,000	\$480,000	\$0	\$0
Upgrade existing at-grade warning devices (g)	\$800,000	\$800,000	\$0	\$0
New Rail Turnouts (6 locations) (n)	\$360,000	\$360,000	\$0	\$0
Subtotal - Construction	\$175,148,282	\$168,412,656	\$10,528,297	\$2,743,382
Acres	421.6	421.6	30.8	7.1
Right-of-Way (f)	\$6,324,000	\$6,324,000	\$462,000	\$106,500
Planning, Design & Construction Engineering	\$35,029,656	\$33,682,531	\$2,105,659	\$548,676
Total Estimated Cost	\$216,503,000	\$208,420,000	\$13,096,000	\$3,399,000
Total Estimated Cost with a 20% Contingency	\$259,803,600	\$250,104,000	\$15,715,200	\$4,078,800
Design Criteria:	1.5% grade, 2:1 side slopes	1.5% grade, 1.5:1 side slopes	1% grade, 2:1 side slopes	1% grade, 2:1 side slopes
Notes:	<p>* Planning, Design & Construction Engineering is 20% of the Subtotal Construction costs</p> <p>* ROW and bridge structures cost estimates incorporated a 4 track rail corridor (as noted by Norfolk Southern), but construction of new track only accounted for double tracks since this is what currently exists along the NS "A" Line (22' wide bridge at \$350 sf)</p> <p>* Total Estimated Cost does not account for cost of relocating road, roadway structures, and relocating buildings.</p> <p>* Cost estimates are in 2008 US dollars</p> <p>(f) - assumed an average of \$15,000 per acre</p> <p>(g) - 5 existing at-grade crossings along the "BL" would need the warning devices upgraded to account for the additional track</p> <p>(i) - if Intermodal site V3 is chosen, 3 bridge structures would be eliminated since they would need to be relocated due to intermodal site</p> <p>(j) - assumes new warning devices would cost \$160,000 a piece</p> <p>(k) - assumes an average of \$35,000 per culvert</p> <p>(l) - assumes \$20 a ton for ballast</p> <p>(m) - assumes \$150 per foot per new track</p> <p>(n) - assumes \$60,000 per rail turnout</p>			

IX. FUNDING

As seen in Section VIII – Cost Estimates, a project of this magnitude will require a significant amount of funding and cost sharing between public and private sources. No one source is likely to provide all of the funding; a combination of funding avenues may be used in order for this project to come to fruition. It should also be noted that the various funding sources might be available during different stages of the project. For example, initial funding efforts could be applied towards planning and environmental components, with other subsequent funding sources being utilized for design activities, and finally construction activities.

This project will likely require cooperation and assistance of a Congressional earmark. As such, efforts to work closely with the U.S. Congressional Delegation are of utmost importance. Additional funding opportunities may be available through other Federal Railroad Administration grants and the Federal Highway Administration, such as:

- Capital Grants for Rail Relocation Projects (Section 9002 of SAFETEA-LU)
- Rail Relocation Grants (FRA)

- Highway/Rail Grade Crossing Program (Section 130/152)
- Safety-Rail/Highway Grade Crossing (FHWA)
- Railroad Rehabilitation and Improvement Financing Program (RRIF)
- Transportation Infrastructure Finance and Innovation Act (TIFIA)
- Tennessee Department of Transportation funding opportunities

One of the most beneficial programs to apply for is the RRIF program. This program was established by the Transportation Equity Act for the 21st Century (TEA-21) and amended by the Safe Accountable, Flexible and Efficient Transportation Equity Act: a Legacy for Users (SAFETEA-LU). Under this program the FRA Administrator is authorized to provide direct loans and loan guarantees up to \$35.0 billion.

The funding may be used to:

- Acquire, improve, or rehabilitate intermodal or rail equipment or facilities, including track, components of track, bridges, yards, buildings and shops;
- Refinance outstanding debt incurred for the purposes listed above; and
- Develop or establish new intermodal or railroad facilities.

The program has established direct loans that can fund up to 100% of a railroad project with repayment periods of up to 25 years and interest rates equal to the cost of borrowing to the government. The FRA established a number of eligible borrowers, such as:

- Class I railroads,
- State and local governments,
- Government-sponsored authorities,
- Corporations,
- Joint ventures that include at least one railroad, and
- Limited option freight shippers who intend to construct a new rail connection.

State and local funding opportunities may also be available through the Tennessee Department of Transportation (TDOT) and or city/county funds. For example, in Tennessee's 2005 25-Year Transportation Plan (*PLAN GO*), over the next ten years, TDOT plans on investing up to \$170 million to enhance the speed and safety of freight transport. Additional funding sources that may be worth pursuing are through local and state economic development grants. Such as the Community Development Block Grants (CDBG) and loans.

In addition, TDOT is suggesting widening I-81 from the I-40/I-81 junction to Exit 23 on I-81 in Hamblen County. TDOT estimates that the widening cost is approximately \$233 million. As noted, future rail freight movement will more than likely increase 60% by 2035, while the total ton-miles of freight movement in this country is expected to increase 92% over the next 30 years. FHWA Freight Analysis Framework report also projects that intercity truck traffic will increase 75% by 2020, with I-81 also exceeding its capacity by 2020. With the increase in freight and truck traffic, the ability to shift traffic onto freight rails will alleviate much of the projected congestion along the many interstates. By working with TDOT in transferring funds for the widening of I-81 to the rail relocation project, the savings in rail

operations would enhance the ability to transfer goods via rail and possibly reduce the amount of intercity truck traffic along I-81.

Recognizing the importance of freight movement in this country, U.S. railroads have lobbied Congress to support tax-credit legislation to boost investments in rail. Unlike roads, there are no dedicated funding sources for freight rail facilities. The Freight Rail Infrastructure Capacity Expansion Act of 2007 has been proposed with bipartisan support. If passed, it would provide a 25% infrastructure tax credit for projects such as new track, grade separations, transfer yards, terminals and intermodal facilities. The proposed bill is a sign that lawmakers understand the demand for rail facilities and recognize that funding rail infrastructure is a wise investment for this country.



In addition, the House of Representatives also passed a \$15 billion bill in June of 2008 to fund Amtrak to set up or expand passenger rail service. The Passenger Rail Investment Improvement Act of 2008 (H.R. 6003) was also a bipartisan bill that passed with a veto-proof margin of 311-104. Support from all sides for both of these bills may be a strong indication that federal funding for rail projects will increase in our country. While sufficient funds may not be readily available for projects like the rail relocation, there are strong indicators that the funding could be available in the very near future.

The Norfolk Southern Railway has not made any commitment to participating in project funding at this phase of the project. However, they will continue to be a participating party throughout the planning phase of the project and evaluate possible sharing of cost opportunities. As the project progresses, a Memorandum of Understanding, outlining the project components and expectations, should be prepared and agreed to by all participating governmental parties and Norfolk Southern Railway.

As noted, there are a number of funding options that exist and may become available in the near future. The ability to work with and coordinate with the numerous agencies and sources for cost sharing will only enhance and expedite the ability to relocate the NS “A” Line and construct an intermodal site.

X. STAKEHOLDERS INVOLVEMENT

Understanding the importance of continued stakeholder involvement in the success of this project, two stakeholder meetings have been conducted to date. Prior to the first stakeholders meeting, the consultant met with Norfolk Southern (NS) on May 7, 2008 to discuss the potential NS “A” Line relocation study to determine if this concept would be something that NS would consider. In addition, discussions with NS revolved around interest in locating an intermodal site within the Jefferson/Hamblen County area. Norfolk Southern design standards for rail and intermodal sites were also discussed and requested in order to ensure that the designs created during the study process met their standards. The first stakeholder meeting took place on June 4, 2008 to discuss existing rail operations, goals and objectives of the study,

issues that could potentially arise during the study process, the methodology of analyzing rail relocation alignments, intermodal yard design standards, as well as other information pertinent to developing feasible alternative alignments. The second stakeholder meeting was held on August 13, 2008 where the alternative intermodal sites were presented along with a rail relocation alignment. Design obstacles and issues were explained to the stakeholders. Further refinement of the alignment was still to be done, as well as a cost estimate and identifying funding sources. Once the alignment was refined, the draft report was presented to the stakeholders on October 8, 2008. At the meeting, concerns for funding were raised due to the costs relating to the relocation of the NS tracks.

During the process of evaluating the railroad relocation, discussions have occurred with the primary stakeholders to determine their interests and expected results. A summary of the discussions is as follows:

Norfolk Southern:

- Norfolk Southern will require a double track operation throughout the railroad relocation corridor, plus the ability to widen to a four track operation in the future.
- Norfolk Southern will require as many grade separated rail crossings as possible.
- Existing at-grade crossing eliminations along the NS “A”, “S”, and “BL” lines will enhance the project.
- Closings of existing at-grade crossings would reduce the amount of maintenance costs for grade crossing safety mechanisms.
- Identify potential intermodal sites near I-81. The intermodal sites should be 1,500’ in width and 7,000’ in length (equates to a total of 240 acres), with 7,000’ of tangent track leading into and out of the potential intermodal sites. At-grade crossings along the tangent tracks should be minimal or non-existent.
- Creative funding options will need to be developed. While Norfolk Southern may consider participating in funding portions of the rail relocation, they will assist in any way possible in reviewing and coordinating internal reviews of plans and reports.

Local Interests:

- Existing at-grade crossing eliminations within the urban area of Morristown and White Pine are much desired.
- Closings of existing at-grade crossings would enhance the emergency response time.
- Relocating the rail line would provide additional land available for industrial development and re-development along a new relocated rail alignment, as well as provide additional economic development opportunities.

XI. RECOMMENDATIONS

A. Rail Relocation

Due to the number of existing trains traveling along the NS “A” Line, relocating the rail line and providing a majority of grade separated crossings would enhance the operations of the NS service. In addition, the rail relocation would improve the vehicular safety where there are existing at-grade crossings that would be eliminated and enhance the emergency response time within Morristown and White Pine.

By relocating the NS “A” Line along a portion of the NS “BL” Line and the new rail alignment, six existing at-grade crossings along the NS “BL” Line would remain and only three new at-grade crossings would be created while eliminating 51 existing at-grade crossings (26 crossings on the NS “A” Line, eight crossings on the NS “BL” Line and 17 crossings on the NS “S” Line).

Alternative V1 would save approximately 6.5 minutes in travel time from Bulls Gap to just south of TN 160, as shown in **Table 10**. This travel time savings was conducted by utilizing the design constraints for the existing NS “A” Line and alternative V1.

Table 10 – Travel Time Savings

	Existing NS “A” Line	Proposed Rail Relocation Alignment
Travel time (from Bulls Gap to Buell Street – Morristown)	34.27 minutes	27.75 minutes

The rail realignment would provide additional economic development opportunities along the alignment, as well as in and around the potential intermodal sites. By working closely with Norfolk Southern, rail operations, safety and economic development would improve within Jefferson and Hamblen County.

The three additional improvements, Bulls Gap Wye Connection, Eastern Industrial Park Connection and the East Tennessee Progress Center Connection would also be recommended in order to provide effortless operations between NS rail lines and continue to provide service to rail customers. The Bulls Gap Wye Connection option V3, along with the Eastern Industrial Park Connection option V3 would be the recommended alignments. These improvements would greatly enhance rail service to existing and future customers as well as provide seamless operations for Norfolk Southern.

B. Intermodal Site

Intermodal site V1 would be the preferred recommended site for an intermodal yard. Intermodal site V1 is located close to I-81, via TN 160, a major trucking corridor, and meets Norfolk Southern’s design criteria. There would be minimal infrastructure improvements required for Intermodal site V1, which would not be the case for Intermodal site V3. Saint Paul Road would need to be relocated and parallel I-81 and the rail alignment since the existing roadway meanders through the intermodal site V1. In addition, a portion of Buell Chapel Road would need to be either relocated or end prior to the intermodal site.

XII. REFERENCES

Federal Register / Volume 73, No. 134 / Friday, July 11, 2008 / Rules and Regulations page 39875 / Capital Grants for Rail Line Relocation Projects.

FHWA Freight Analysis Framework, http://www.ops.fhwa.dot.gov/freight/feight_news/FAF/talkingfrieght_faf.htm

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Tennessee Department of Transportation. 2005. Final Report: Tennessee Long-Range Transportation Plan Modal Needs.

U.S. Census Bureau, 1960-2000 Data

U.S. Government Accountability Office. 2008. Report to the Ranking Member, Committee on Environment and Public Works, U.S. Senate: Freight Transportation- National Policy and Strategies Can Help Improve Freight Mobility.

APPENDIX A – RAIL RELOCATION ALIGNMENTS, INTERMODAL SITE LOCATIONS, BULLS GAP WYE CONNECTION, EASTERN INDUSTRIAL PARK SIDING TRACK DESIGNS

APPENDIX B – EXISTING AND PROPOSED OPERATIONAL DIAGRAMS