Potential Economic Benefits of Public-Private Partnership (P3s) on Reclaimed Mine Sites in the Construction of the I-73/74 NHS Corridor

(Final Report)

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16. Abstract

A public private partnership (PPP or P3), according to the FHWA, "…is a contractual agreement between a public agency and a private entity for private sector participation in the delivery of transportation projects". One of the most innovative aspects of the KCH is the P3's which have developed and continue to develop. These consist of using surface mine sites as locations for portions of the KCH roadbed. Under this form of P3, after extraction of the coal by surface mining, instead of returning the property to as near as possible its original contour, the mining company agrees to build a section of rough roadbed. When completed, the roadbed will be turned over to the WVDOT for further development. Further, the company which extracted the coal proceeds as a construction company to build the rough road bed on adjacent property. The coal company is allowed to remove all coal located within the right of way. The sale of the coal extracted is used to reduce the cost to the public sector of building the roadbed. This project examines the potential for the expansion of P3 in the construction of the KCH. The analysis also includes an estimation of the possible economic benefits of using P3's along the route of the KCH and the economic development which could result.

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EXECUTIVE SUMMARY

This report explores the economic benefits available through the use of Public Private Partnerships (P3s) for construction of the I-73/74 NHS Corridor.

Chapter 17 of the West Virginia Code refers to a P3 as a "consortium that includes the Division of Highways, a governmental entity, a highway authority or any combination thereof, together with a private entity or entities, which proposes to finance, acquire, plan, design, construct, expand, improve, maintain or control a transportation facility. Public private partnerships (P3s) are fairly new to the United States, but with issues such as insufficient highway funds and needs for improved financial practices becoming more urgent, their usage for funding transportation infrastructure is becoming more widespread. P3 activities include financing, planning, design, construction, operation, and maintenance of projects.

In 1991, Congress identified the need for a north-south corridor that would extend from northern Michigan to Myrtle Beach, South Carolina, not only passing through these states but North Carolina, Virginia, West Virginia and Ohio as well. This roadway came to be known as the "I-73/74 North-South Corridor" and was named by Congress as a high priority corridor on the National Highway System in 1995. The West Virginia portion of this congressionally designated corridor is to serve as a multi-lane replacement of the existing US 52 alignment.

The I-73/74 NHS Corridor will extend approximately 150 miles from Huntington to Bluefield and is divided into two sections, The Tolsia Highway, extending from Huntington to Williamson (51 miles) and the King Coal Highway (KCH) which will extend 95 miles from Williamson to Bluefield (Figure 1). Based on the estimates in our study, the entire I-73/74 NHS corridor is project to cost approximately $3.9 billion.

One of the innovative aspects of the I-73/74 NHS Corridor consists of using reclaimed surface mine sites as locations for part of the roadbed. With this form of P3, coal is extracted through surface mining, but instead of returning the property to as near as possible its approximate original contour (AOC), the mining company agrees to build a section of rough roadbed as part of an approved Post Mine Land Use (PMLU). When completed, the roadbed will be turned over to the West Virginia Department of Transportation (WVDOT) for further development and eventual placement into the West Virginia road system.

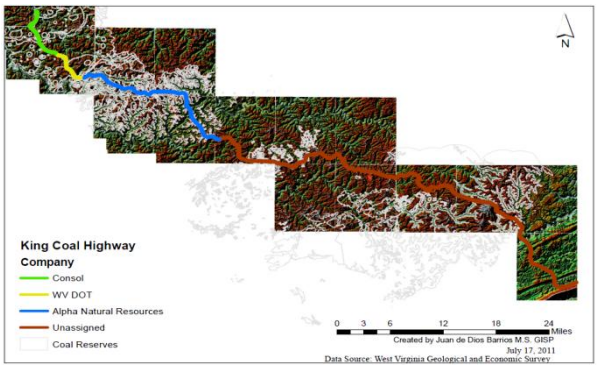
A previously negotiated agreement between the WVDOT and Alpha Natural Resources (ANR) provides for 11.37 miles of rough roadbed as a result of surface mining in Mingo County. When completed this roadway is expected to save $170 million in construction costs, an estimated savings of 50 percent. CONSOL Energy Inc. (CONSOL) has entered into a P3 with the WVDOT concerning roadbed construction at the Buffalo Mountain site in Mingo County.

This project will provide the state with 5 miles of rough roadbed with estimated savings of more than $110 million. Once CONSOL has obtained the permits, it will then take 6 to 8 years to remove the coal.

Figure 1 – King Coal Highway route

Our study reviewed coal reserve maps along the route of I-73/74 to examine the potential for additional P3s with mining companies. Figure 2 shows that while coal reserves exist along the route, there is not enough coal in the southern portion of the roadway to justify the current P3 practice without proper incentives.

Figure 2 – Coal reserves along the KCH



The creation of I-73/74 leaves a large quantity of land that could be used for commercial development projects that provide a positive impact to the surrounding areas. Obvious choices for commercial development include fast food, full service restaurants, gas stations, hotels, retail shops and a variety of service businesses.

Realizing that PMLU presents the state with an opportunity to pursue options for the betterment of the state, former Governor Joe Manchin III established the Post-Mine Land Use Redevelopment Group/Task Force. This group is committed to assisting counties with surface mined land in exploring the best post-mine options. Counties should focus on economic development, planned roads, utilities, and possible sources of funding to achieve desired results.

Mingo County has the most experience in PMLU and has achieved success with a number of projects that benefited from the creation of the Appalachian Development Highway Corridor G which extends from Huddy, Kentucky to Charleston for approximately 81 miles. Among these projects include the Mingo County Air Transportation Park, a 900 acre site with a state of the art 7,000 foot runway and an additional 800 acres of developable property. This project is estimated to generate 25 new jobs in Mingo County.

Also in Mingo County, TransGas has proposed a $3 billion Coal-To-Liquids Plant that will produce 750,000 gallons per day of ultra-clean Premium 92 Octane gas using only 8,300 tons of low quality coal. This project is expected to create 1,500 temporary construction jobs, 300 permanent jobs and 300 additional jobs in services directly related

to the facility. Future projects and projected employment are shown in Table 1.

Potential PMLU options along the I-73/74 NHS Corridor include distribution centers, agri-tourism, aquaculture, recreation and the possibility of automotive manufacturing. The construction associated with the corridor will create a vast amount of useable land. Service businesses are ideal due to the percentage of service related jobs in the five county study area and the expected need of additional jobs once the corridor has been completed.

Table 1 - 10 Year projected job growth by 2020 (Mingo County)

Project	Projected Employment
TransGas Coal To Liquids Plant	300
Air Transportation Park	25
American Clean Energy Wood-to-Electricity Plant	80
Wright Concrete Bagging Facility	15
4H/Youth Camp	20
King Coal Highway Growth Corridor (Misc.)	500
TOTAL – Projected Direct Jobs	940
TOTAL – Projected Indirect Jobs (multiplier 2)	1880

The I-73/74 NHS Corridor will pass through McDowell, Mercer, Mingo, Wayne and Wyoming counties. Populations are aging and decreasing in these counties and per capita personal income remains well below both the West Virginia and United States averages. While net earned income is increasing, the I-73/74 average is considerably lower than both the West Virginia and United States averages. Mining makes up the largest portion of employment in our study region, however government and service industries hold a considerable share of employment. Overall, the service sector provides the greatest number of jobs to all West Virginia residents and is increasing (33 percent in 2001, 34 percent in 2005 and 35 percent in 2009).

Our study used the Regional Economic Impact Model (REMI) to estimate the economic impact of the I-73/74 NHS Corridor under two scenarios. REMI provides year-by-year forecasts while TranSight predicts the demographic economic effects from a transportation project.

The purpose of the REMI analysis is to compare the economic impacts of completing the I-73/74 NHS Corridor without (Scenario I) and with (Scenario II) the use of P3s. Using data from a 2004 USDOT report to Congress, it was found that innovative project delivery provided 36 to 89 percent time savings with an overall average of 59 percent. Cost savings ranged from 3 to 23 percent, with an overall average of 12 percent.

Our study found that using P3s would provide significant construction cost and time savings for the I-73/74 NHS Corridor. Constructing the roadway without the use of P3s is estimated to cost $3.9 billion and engaging in a P3 would save approximately $700 million.

Impacts of the corridor are numerous and include an estimated 17.4 to 20.3 percent increase in vehicle-miles travelled (VMT) as well as an estimated $5.1 million of safety benefits in the five counties. Using total annual industry payroll data for Corridor G, our study found that payroll increased an average of 27.86 percent for the years 1998 to 2009. With this figure we estimate a $15.27 million increase in the service industry in the five county study region.

The REMI analysis used data to determine the impact of the roadway on major macro-economic indicators (total employment, gross regional product, personal income and industry output). Based on the results of our study, both scenarios have a positive impact on total employment, but using P3s provides faster and greater benefits.

Scenario II shows larger impacts due to faster completion of the roadway, 844 jobs in 2012 compared to 571 for Scenario I. The construction industry is expected to benefit substantially in the short-run, peaking in 2012 with 452 construction jobs for Scenario I and 642 for Scenario II. As construction is completed, service related jobs will benefit in the long-run (74 jobs in 2023 for Scenario I and 63 jobs in 2017 for Scenario II).

The study region benefits from both scenarios in terms of Gross Regional Product (GRP), which reaches as high as $28 million and $42 million in 2012 for Scenario I and II respectively. When construction is completed in 2050, GRP has been estimated at $15 million for Scenario I and $29 million for Scenario II.

Personal income will experience a substantial increase for both scenarios, increasing as high as $82 million for Scenario I and $132 million for Scenario II in 2050. This is almost 5 times as much as personal income in 2012 for both scenarios ($17 million in Scenario I and $26 million in Scenario II).

Industry output will be high in the short run when construction begins and in 2012 is estimated at $51 million and $76 million for Scenario I and II respectively. 2050 industry output is estimated to be $25 million for Scenario I and $46 million for Scenario II.

Fiscal impacts exhibit a similar trend as both Scenarios provide positive tax revenue changes. However, Scenario II offers greater positive impacts. These impacts are substantial for business and occupation taxes (Scenario I $128 and Scenario II $8,515 in FY2013), consumer sales taxes (Scenario I $230,265 and Scenario II $574,144 in FY2013) and personal income taxes (Scenario I $722,128 and Scenario II $1,634,676 in FY2013).

Some states do not allow mixing public and private funds on a highway project so it is vital for legislation to allow public project sponsors to lend public funds to private entities. Transportation P3s must take into consideration a variety of statutory-based and negotiation-based legal provisions.

Possible P3 incentives include but are not limited to tax credits, severance taxes, reclamation fees, property tax exemptions and tax increment financing.

Nationally, West Virginia is ranked 11th highest in terms of its Corporate Net Income Tax. Guaranteeing minimized tax burdens could incentivize mining authorities to construct rough roadbed. New Market Tax Credits are also a possibility and offer a way to generate funds for development and encourage economic growth in distressed areas while relieving the heavy burdens of high corporate income taxes. Also, a reduction of coal severance taxes or reclamation fees could spur interest in a P3.

Many innovative programs and financing mechanisms exist (Table 2) and can assist in facilitating and supporting highway P3s. These include Federal-Aid Fund Management (advance construction or Federal-Aid matching programs), Federal Debt Financing Tools (Grant Anticipation Revenue Vehicles or Private Activity Bonds), Federal Credit Assistance Tools (the Transportation Infrastructure Finance and Innovation Act, State Infrastructure Banks or Section 129 Loans), Public-Private Finance Mechanisms (pass-through tolls or availability payments) and other financing mechanisms such as Non-Federal Bonding and debt instruments.

Table 2 – Innovative P3 financing options

P3 Funding Options	Examples
Federal-Aid Fund Management	• Advance Construction and Partial Conversion of Advance Construction • Federal-Aid Matching (Flexible Match, Tapered Match, Toll Credits/Soft Match, Program Match, Third Party Donations)
Federal Debt Financing Tools	• Grant Anticipation Revenue Vehicles • Private Activity Bonds
Federal Credit Assistance Tools	• Transportation Infrastructure Finance and Innovation Act • State Infrastructure Banks • Section 129 Loans
Public-Private Finance Mechanisms	• Pass-Through Tolls/Shadow Tolling • Availability Payments
Other Financing Mechanisms	• Non-Federal Bonding and Debt Instruments

Future P3s in West Virginia should take the following into consideration:

- Project Selection
- Value for Money Principle
- Appropriate Risk Share
- Standard P3 Contracts
- Contract Flexibility
- Clear Contract Management
- Establish a P3 Equilibrium Framework

The P3 possibilities vary based on the location of each county along the route of I-73/74 as well as accessibility to transportation systems and the ability to provide utilities such as water, sewage and fiber-optic communications.

Mingo and Logan provide the greatest amount of potential development and are able to draw from their past PMLU experiences. Master-planned communities as well as service, retail and other commercial options are viable for these counties.

The geographic layout of Wyoming and McDowell Counties make it difficult to develop potential PMLU projects in conjunction with the new corridor. Agritourism activities such as orchards, vegetable picking, horseback riding, and vineyards make for viable options in these geographically and economically challenged areas of West Virginia.

Mercer County has no reclaimed mine sites along the route and the county must use other areas of developable land. The Mercer County airport provides an opportunity for a possible air-transportation park but agritourism and recreation remain as feasible options.

In addition to using P3s for completion of the I-73/74 NHS Corridor, there are several open or potential highway projects in the state that could benefit from P3s. These include Grafton's Bridge Street Bridge, US 35, and the WV 705 Connector.

When considering P3s and/or financing for future highway transportation needs, the following guide actions have been offered.

1. Creation of a dedicated P3 project team/task force.
2. Establishment of a State Infrastructure Bank (SIB).
3. Prioritization of transportation and non-transportation related projects based on state needs.
4. Innovative financing tools and programs such as the Transportation Infrastructure Finance and Innovation Act (TIFIA) program and Grant Anticipation Revenue Vehicles (GARVEE) bonds should be utilized.
5. Transparency is essential to future P3s as projects increase in scale and complexity.
6. Economic and social benefits that are made possible by the creation of the roadway should be updated and communicated to outside parties, particularly the public.
7. Seminars, workshops, conferences and town hall style meetings that involve state and local agencies are highly encouraged.

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CHAPTER 1: INTRODUCTION

Although public-private partnerships (P3) are fairly new to the United States, their usage in funding various forms of transportation infrastructures is increasing and becoming more wide-spread. Insufficient highway funds, concerns about financial and managerial practices, interest from private investors, and other factors have led to substantial discussion of P3 for state and federal projects and programs (Brown et al., 2009). The FHWA defines the term "public-private partnership (P3)" as "a contractual agreement between a public agency and a private entity for private sector participation in the delivery of transportation projects." The definition can be expanded to "a wide variety of project financing and delivery approaches which offer the potential to expedite project delivery, operations, and maintenance in a more cost-effective manner, enabling transportation agencies to effectively - do more with less." (AECOM Consult Team, 2007). P3 activities include financing, planning, design, construction, operation, and maintenance of projects. Through P3s, government and private companies can build large, capital-intensive, long-lasting public infrastructure (e.g., highway, port, and public buildings).

In Europe, Canada, and the U.S., P3s are becoming more popular as a means to downsize government. (Savas, 2005). Traditionally P3s have been used to transport energy and water, but more recently they have begun to also cover IT services, leisure facilities, military training, waste management, and even schools and hospitals (Iossa and Martimort 2008). Advocates of P3s see collaboration between a public sector authority and private companies engaging corporations in a project, raising awareness, and increasing resources.

In West Virginia, there is growing demand for an effective P3 strategy to deliver various state projects, especially highways. Successful partnerships between public and private organizations can create a unique opportunity to capitalize on knowledge and experience. P3 can reduce the role of government and increase the role of the private institutions of society in meeting people's needs (Savas, 2005). Therefore, P3 can be used to fill in the gaps between the levels of highway infrastructure and service demanded and the funding available to finance, construct, operate and maintain the highway system in West Virginia. Successful P3 programs that improve infrastructure for residents and businesses can have a positive impact on residents and businesses in West Virginia.

In 1991, Congress identified the need for a north-south corridor from northern Michigan to Myrtle Beach, South Carolina which would pass through South Carolina, North Carolina, Virginia, West Virginia, Ohio and Michigan. The need was further recognized in 1995 when the West Virginia Department of Transportation (WVDOT) conducted the *King Coal Highway Purpose and Need Study* which also concluded that there is a need for the King Coal Highway (KCH) which would enhance both regional and local system linkage, improve the access for emergency services, community services and ultimately enhance employment opportunities in

the region. The "I-73/74 North-South Corridor" was named by Congress as a high priority corridor on the National Highway System in 1995. The WV portion of this congressionally designated corridor is to serve as a multi-lane replacement of the existing US 52 alignment, extending approximately 140 miles from Huntington to Bluefield, and is divided into two distinct sections. The Tolsia Highway generally extends from Huntington to Williamson (51 miles), and the KCH extends from Williamson to Bluefield (95 miles). West Virginia State Route 65 (23.8 miles) which runs from Matewan to Naugatuck and the Shawnee Highway (20.8 miles), a proposed two-lane arterial highway running through McDowell, Wyoming, Mercer and Raleigh in southern WV are both considered part of the I-73/74 Corridor to ensure federally earmarked money.

One of the innovative aspects of I-73/74 NHS Corridor consists of using reclaimed surface mine sites as locations for part of the roadbed. Under this form of P3, instead of returning the property to as near as possible its approximate original contour (AOC) after extraction of the coal by surface mining, the mining company agrees to build a section of rough roadbed as part of an approved Post-Mine Land Use Plan (PMLUP). When completed, the roadbed will be turned over to the WVDOT for further development.

The first of these P3s associated with the KCH in WV was the "Red Jacket Project" in Mingo County. Six miles of rough grade roadbed were completed in 2007. The construction was undertaken by Alpha Natural Resources (ANR) of Abingdon, VA. As ANR removed the coal the site was reclaimed by building the rough roadbed. The site creates 1,500 usable acres of developable land out of the flood plain and contains the 90 acres for the new Mingo County Consolidated High School which was donated by ANR as well as a substantial $400,000 donation towards the construction of utilities to the school and athletic fields (MCRA, 2011). The project will also encompass 11.37 miles of the I-73/74 NHS Corridor and reduce construction costs by over $170 million as well as create approximately 80 jobs. An additional P3 agreement has been reached with CONSOL Energy Inc. (CONSOL). CONSOL will reclaim part of a proposed surface mine in Mingo County by creating five miles of rough roadbed for the KCH. This transfer is in the future as CONSOL will need about 18 months to obtain a permit and six to eight years to remove the coal. The estimated savings is more than $110 million for that stretch of highway.

The unique nature of these P3's has drawn national attention to the I-73/74 NHS Corridor. In VA, ANR has entered into an agreement with the VDOT following the WV model. There are 31 miles of the planned 55 mile Coalfields Expressway (CFX) which traverse coal property owned by ANR and its partner Pioneer Group. No details on when work will begin or estimates of cost savings to the CFX have been released.

Study Objectives

The Nick J. Rahall II Appalachian Transportation Institute (RTI) and Center for Business and Economic Research (CBER) at Marshall investigate the potential for the expansion of a P3 in the construction of the I-73/74 NHS Corridor. This report explores the economic benefits derived from the P3 for construction of portions of the I-73/74 on land that is being surfaced mined or will be surface mined and adjacent land that lies in the designated route of the corridor. Specific objectives are as follows:

- Review of P3 projects and common lessons;
- Overview of the I-73/74 NHS project;
- Discussion of potential for additional P3's through PMLUs along the route of I-73/74 NHS Corridor;
- Review of detail maps of the route to be followed to establish where coal property may underlie the proposed roadbed;
- Documentation of ownership of coal reserves along the proposed route from existing land use plans and information;
- Review of recommendations of the Post-Mine Land Use Task Force;
- Estimation of potential economic benefits from the P3 to include cost savings from construction;
- Estimation of economic and fiscal impacts from the I-73/74 NHS Corridor project;
- Discussion of potential P3 project contract management and implementation strategy; and
- Documentation of principal findings and recommendations.

This report presents suggestions and recommendations that can be used to guide the potential P3 projects, implementation strategy, and prioritization of investments. Specifically, the report highlights public and private benefits from P3 projects to West Virginia. The empirical analysis includes: 1) cost savings from the construction, 2) regional economic impacts from the I-73/74 NHS Corridor project including short- and long-run effects and benefits from the anticipated reduced accidents, and 3) fiscal impacts from the I-73/74 NHS Corridor project. However, a full scope of engineering, environmental, and community impacts are not estimated in this report. In-depth engineering and environmental assessments for the I-73/74 NHS Corridor can be discussed in future research.

This report includes six chapters in addition to the introduction. Chapter 2 provides an overview of P3 Projects and common lessons learned. It reviews a role of P3 in national highway and P3 program evolution. Chapter 3 provides an overview of the I-73/74 NHS Corridor project, with a summary of the agreements between the public and private entities. In Chapter 4, potential for additional P3's along the route of I-73/74 are identified and discussed. The discussion entails recommendations of the Post-Mine Land Use Task Force appointed by the Governor. Chapter 5 will provide an estimation of economic effects from the completion of I-73/74 NHS Corridor. It reviews the relevant economic impact studies and builds a regional economic impact model to quantify the economic impacts of I-73/74 in West Virginia. Fiscal impacts from the I-73/74

NHS Corridor project will be discussed. Chapter 6 will then present potential P3 project contract management and implementation strategy. Finally, Chapter 7 will summarize key findings and provide suggestions. The findings of this report will to provide comprehensive information to support the WVDOT's P3 management and strategies.

CHAPTER 2: P3 PROJECTS AND COMMON LESSONS LEARNED

Role of P3 in National Highway/Roadways

The U.S. Government Accountability Office (GAO) defines a highway P3 as "highway-related projects where the public sector enters into a contract, concession, or lease agreement with a private sector firm, and the private firm will design, construct, maintain, or operate the facility for a specific amount of time" (GAO, 2008). The state of West Virginia has a similar definition as Chapter 17 of the West Virginia Code refers to a P3 as a "consortium that includes the Division of Highways, a governmental entity, a highway authority or any combination thereof, together with a private entity or entities, which proposes to finance, acquire, plan, design, construct, expand, improve, maintain or control a transportation facility (WV Legislature, n.d.).

P3s are increasingly used as a cost-effective tool in meeting public needs, maintaining a high level of public control, improving the quality of services and are more cost-effective than traditional delivery methods (NCPPP, 2010). Concern for project delays makes some public sector entities hesitant to try hybrid road construction, where a single private contractor conducts multiple functions of maintenance, construction, or management. However, research shows that hybrid contracts decrease project length (Henk, 1998).

For example, Henk (1998) showed that combining two portions of a design/build project under a single contractor resulted in no delays and no overall growth of project schedules. A design/build demonstration project of the Florida Department of Transportation had 54 percent faster design times and 18 percent faster construction times because of the collaborative efforts throughout the project. In Orange County, CA the San Joaquin Hills Transportation Corridor and the Eastern Transportation Corridor were more than a year ahead of schedule. In a P3, the governmental group details its goals, needs, and requirements plainly and practically. Then, the private entity is able to create a solution that is technically sound and financially feasible.

A 2008 GAO report outlines potential benefits associated with P3s for both the public and private sector. Among the benefits for the public sector include the ability to finance construction of various highway projects without public funding, thus conserving these funds for other projects. Funding by the private sector also assists in avoidance of legislative or administrative blocks that would limit the amount of debt allowed for a particular highway project (GAO, 2008). Making alterations to traditional financing methods has brought up great discussion. Henk (1998) presents a strong case for the benefits attained by the synergy of allowing private-sector entities to complete multiple functions outsourced on an independent basis.

Frequently, the construction of public highway infrastructure projects will exceed the schedule or cost estimates so the ability to transfer construction costs and scheduling risks to the private

sector is invaluable to the public sector. A 2004 standard set by the USDOT established a goal that 95 percent of major federally funded infrastructure projects should meet cost and schedule milestones established in project agreements/contracts or at least achieve them within 10 percent of the scheduled milestones. These federally funded highway projects missed the goal in the 3 years following the establishment (GAO, 2008).

P3 can also provide efficient asset management that leads to greater efficiencies in operations and project life-cycles which reduces the total project costs over the project's lifetime (GAO, 2008). In a P3, the private sector has a greater financial ability and the freedom to use innovative technologies and cut costs associated with the designing and building of highway infrastructure. The Chicago Skyway took advantage of this benefit as the private concession company invested in electronic tolling technologies within the first year of taking over management. The increased mobility, higher traffic volumes, reduced need for toll collectors and decreased congestion at the toll plaza outweighed the high costs of new technologies. With a limited annual budget, the city could not dedicate enough funding to make the same initial investment in these tolling technologies.

Under highway P3s, funding for maintenance and repairs are all but guaranteed through contractual provisions requiring the private entity to keep the highway in a certain condition. Lastly, publicly financed and operated highways are limited by the amount of money available by annual appropriation cycles thus making it difficult to obtain needed capital if funding is not available.

Table 2-1 Public and Private Sector Costs/Benefits Associated with Highway P3s

	Advantages/Benefits	Costs/Issues
Public Sector	• Avoiding an increase in public debt. • New facilities with little to no public investment or funding. • Avoiding legislative or administrative limits on debt. • Reduced capital costs of new infrastructure. • Access to revenue sources for highway construction such as toll, tax revenue or private capital. • Transfer of construction costs and scheduling risk to the private sector. • The use of tax exempt financing and potentially refinancing investments.	• Assumption of risk (project scope, public support and right of way). • Lack of legislation regarding establishment of P3s. • Non-compete clauses/concession agreements can make future projects and improvements difficult. • Little to no control over tolling. • Unsolicited proposals and pursuit of interests. • Costs of advisors and private finance.
Private Sector	• Efficient operations and management of assets. • Access to innovations and technologies that substantially cut costs. • Contractually obligated to maintain and repair infrastructure. • Ability to increase the number or size of highway projects in production. • Operation of toll highways as long term profitable investments.	• Assumption of construction cost and scheduling risks. • Projects may require additional approvals (i.e. environmental review). • Assumption of tort liability.

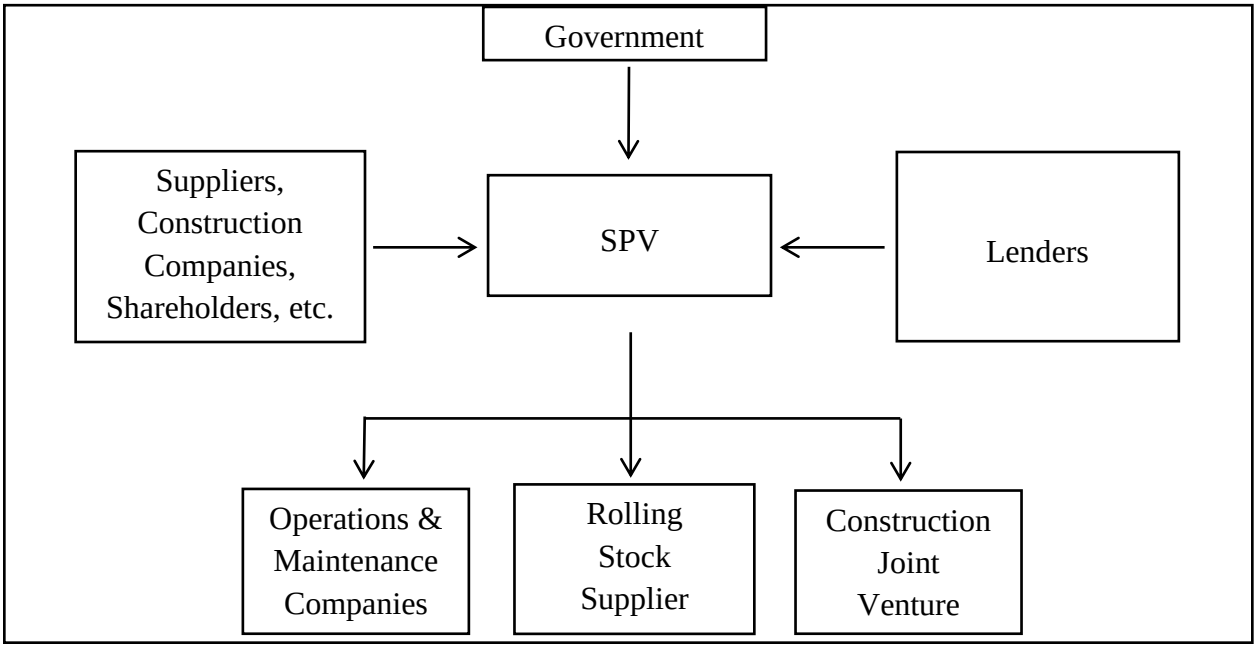
Sources: KCI Technologies, 2005; NCHRP, 2009; Savas, 2005; GAO, 2008

P3 Structure

The construction, management, and operating frameworks developed around standard financial and legislative structures for urban transport are generally complicated. Because financing structures can be difficult for governmental authorities, the P3 has become a viable option. P3s can take place in a variety of ways and are moldable into an assortment of formats (Verhees and Oeveren, n.d.). Both public and private investments are considered, with special attention provided for market-based futures and partnership-based futures. Market-based futures involve making investments in the infrastructure based entirely on business performance and with minimal public investment. Partnership-based futures involve heavy influence from the public sector, often using justifications of mobility, economics, safety, environmental, and other public benefits including but not limited to efficient modes of travel.

P3s are in existence, but they vary greatly and do not have a set model. Most transportation decision-making powers have been delegated to the state and local governments. While partnerships between private and public entities for transportation development are not fully defined into a prescribed formula, neither has the project funding mechanisms pre-established.

Figure 2-1 Structural Example of a P3 in the U.S.



Source: ARUP, 2010

Figure 2-1 demonstrates the logistics of a P3 in the U.S. The relationships between the government, suppliers, and lenders relate to the Special Purpose Vehicle (SPV), which passes the investment risk on down. A SPV is an entity which limits its operations to the acquisition and financing of specific assets, usually a subsidiary company with a structure and legal status that makes its obligations secure even if the parent company is unable to meet its financial obligations. It is important for the lenders to see that the project's risk is passed down from the SPV, because financial institutions will be lending to the SPV. Assets can be retained while much of the risk of providing projects to private partners or consortiums can be shifted. Lease payments can be made to the private partner, and agencies can spread their large upfront costs out over a longer period of time, similar to a 30-year mortgage versus a 15-year mortgage. Many of such projects will comprise elements of Design, Build, Finance, Operation, and Maintenance (DBFOM) (Clark and Higton, 2010).

Determining the correct mix of DBFOM is a crucial component of a P3. Common types of P3 contracts include *design-bid-build* (DBB), *design-build* (DB), *design-build-operate-maintain* (DBOM), *long-term lease agreements* (LTL), *design-build-finance-operate* (DBFO), *build-operate-transfer/build-transfer-operate* (BOT/BTO) and an option very similar to BOT/BTO; *build-own-operate* (BOO) (MTI, 2010) .

The most traditional of the P3 approaches, a *design-bid-build* (DBB) contract requires an arrangement between the public sector and private sector engineers/architects in order to design a project that meets their requirements and specifications. Bids are then accepted for the construction of the project, pared down and eventually a construction company is chosen. As provided in the DBB agreement the design and construction companies are responsible for all costs incurred in their roles while the public entity is responsible for financing and assumes all ownership and operation risks as the project will remain under control by the public entity. A *design-build* (DB) contract is similar to a DBB but a private partner designs and constructs a facility, instead of separate entities taking part in the design and construction.

There are several key aspects of a *design-build-operate-maintain* (DBOM) arrangement that differ greatly from a DBB or a DB. Under this type of contract, the private party is responsible for all aspects of the project, including design, construction, operation and maintenance for a specific period of time. The private entity is paid based on its ability to meet criteria established by the public entity before the project began and can include standards such as physical condition of the project, traffic congestion, quality of the ride and capacity. The government usually retains ownership and is responsible for all financing activities. However, a *design-build-finance-operate* (DBFO) contract is similar to a DBOM but the private entity assumes some of the financing and financing related risk. The entity is then fully responsible for the design, construction, financing, operation, maintenance and expansion in exchange for the right to toll revenue.

A *long-term lease* (LTL) agreement provides a private entity the opportunity to bid on the possibility of leasing an existing toll facility for an extended period of time. Acceptance of the bid will require the private partner to provide maintenance, operation, improvement and expansion in exchange for tolling revenues as well as assuming the risk attached to the facility. The public entity still retains ownership but sometimes can reap benefits such as upfront concessions, yearly lease payments or even revenue sharing.

The public and private sectors are also able to rely on a P3 agreement known as *build-operate-transfer/build-transfer-operate* (BOT/BTO). When this type of contract is established between the parties, the private entity designs, constructs, finances, and operates the facility under the stipulations required of a DBFO contract. The project is privately owned until the end of the construction period or another specified time period, then ownership is bestowed upon the public sector.

Lastly, *a build-own-operate* (BOO) contract requires the private partner to design, finance, construct, own, maintain and operate a facility thus assuming all risk associated with the ownership and operation. The private partner is not contractually obligated to transfer ownership of the project to the government although negotiations may take place at the end of the concession period, or the government may have the option to purchase the project.

P3 Program Administration and Management

The use of P3s in the U.S. has not expanded to meet their potential, yet the partnerships have played a small role in highway infrastructure. Discussions of potential P3 benefits have increased across both state and federal levels due to limited funding availability, increasing capacity needs, and attention garnered by private investors. Because of the limited amount of P3 experience in the U.S., observations from P3s abroad have created vital and informative resources for a variety of transportation projects.

Brown et al. (2009) examined P3s in other countries in order to analyze their origins, roles, structures, evolution and public acceptance. For example, Spain has relied on private sector involvement in the development and management of highway infrastructure since 1960. It was this year that the concession for the Guadarrama Tunnel was granted based on legislation passed in 1953 allowing private entities to construct toll ways for a maximum of 75 years. In order to facilitate rapid construction, specific legislation was passed and in many cases beneficial terms were granted to the private developers. Also, in Europe, more than 40 P3s were registered in 2008 alone.

In June 2008, the National Cooperative Highway Research Program (NCHRP) sent a team of nine professionals internationally to assess existing P3s. The team learned that P3s can be very effective for both the delivery and financing of transportation projects, yet the larger interest of the public must be kept in mind throughout the process. Contract formation, partnership management, maintenance, and continual enhancement are details that must be analyzed and planned for appropriately. Across the different countries, the team's perceived successes of the P3s correlated with the host nation's economic development and improvements in transportation and transportation infrastructure (Brown et al., 2009).

General findings of the team's P3 studies included several observations. First, the team realized that P3s can be advantageous for the development and implementation of programs beyond the ability to finance large projects. The team also noted that the presence of P3s is growing among highway networks and new projects for vehicular mobility systems. P3 project management and the financial arrangement may not be the same for different projects, but it must be carefully planned and steadily include foundations of technical, commercial, and legal conditions in the long-term contract between the public and private sectors.

The team also discussed the P3 project life cycle, noting that the planning process from potential to projected completion is vital. The preferred results must be established beforehand so that an action plan can be created for successful achievements without compromise. Risk factors must be evaluated, and an independent party should be involved for administrative and compliance phases of the project. Key Performance Indicators (KPIs) are performance measures that monitor desired success according to contract guidelines and specific targets. The team found the practice of financially rewarding or penalizing contractors effectively helped to keep the

project progressing. Overall, successful P3s require strong overall visions to be shared by leadership so that they can agree on the large items that determine the project's success.

In addition, the public sector would benefit as P3s are enacted domestically and abroad. Like the U.S., these countries also had financial challenges and used P3s because they did not have sufficient funding for their highways' demanded expansions, restorations, and preservation. P3s were found to increase efficiency of project development time and provide increased price and time reliability. Scale and complexity of design were the two defining factors for P3 projects overall and most contract periods ranged from 30 to 40 years, with a maximum of 50 years.

Upon completion of the NCHRP scanning study, implementation strategies were recommended for the preparation, selection, and success of domestic P3 projects. In the short-term a scanning study is recommended, which focuses on conversations between public and private-sector decision makers. A task force should be created to scan for existing needs and possibilities. Drafts of need should be established, and a project scope should be created. Similar cases should be studied for comparison, tips for success, recommended changes, and implementation processes. Upon completion of short-term actions, a strategy should be established to assist needed research on past and current projects, lessons learned, procurement issues and program evolution. In the long-term, documents should be created to establish guidelines for the following: establishing, identifying, and evaluating a P3 program, procuring P3 projects, creating and managing P3 contracts, and measuring program and project performance.

P3 contracts may need to be more flexible than traditional short-term contracts since these contracts are made on a long-term horizon of typically 20-35 years. This flexibility and adaptation is necessary to counteract the likelihood that the provisions stated in the original contract may become obsolete. The contract can be changed with "change the mechanism-clauses" through mutual consent of the parties. If there is a full commitment to a long-term cost reimbursement rule, the others find that the optimal contract has more high powered incentives such as cost reimbursement and payment linked to the level of operating costs which directly affects infrastructure and asset quality. The optimal contract also has an inefficient level of investment. Additionally a risk of inefficient regulatory policy will lower incentives for investment in asset quality. This increased risk also leads to more low powered incentives composed of minimal risk for the contractor (Iossa and Martimort, 2008).

There is no required structure for the public entities that administer and manage P3s. They can range from traditional highway agencies to state-owned enterprises. In 2005, Portugal created the Estradas de Portugal, S.A. (EP) as a state-owned enterprise responsible for management and development of the national highway system. By holding a 75-year concession with the national government, EP will execute all future P3 agreements on behalf of the Portuguese government and ultimately the assets under existing P3 contracts will transfer to EP when the contracts expire (Brown et al., 2009). The need to move government debt off the national balance sheet to

remain compliant with EU budgetary standards was the chief component in the decision to create the EP.

Spain is another example as the Spanish highway system is managed by the director of general roads, who reports to the secretary general for transportation in the Ministerio de Fomento (Department of Development). No distinct national highways agency or department exists and the director general has oversight of the national P3 program.

The United Kingdom is similar to Spain as they have developed a department that plays a pivotal role in administering and managing individual P3 contracts. The Highways Agency is a division of the Department for Transport and manages the English strategic road network with sole responsibility for the national PFI (P3) program.

Three of the six Australian states opted to establish separate frameworks regarding their administration of P3 programs. In New South Wales, the Roads and Traffic Authority (RTA) has oversight of the highway system and the P3 program. Victoria created temporary public authorities in order to manage the procurement of highway P3 projects. Once the projects are operational, the public authorities are disbanded and the responsibility then falls onto VicRoads, the state's highway agency. Queensland relies on the state's Department of Main Roads for its contract management.

Public Acceptance of P3s

Despite the benefits that P3s provide to the public, many individuals maintain a negative perception of these agreements (Brown et al., 2009). Although public acceptance abroad has greatly improved over time it will take a concerted effort in order to assist the public sector in realizing the potential of P3s in the United States. One of the chief causes of public concern is the question of whether or not the private sector is acting in the best interests of the public or motivated purely by profit when pursuing a P3 (Savas, 2005). Profit maximization is typically the number one goal of the private sector partner. Private firms use their skills and knowledge in accordance with the purpose of the project, and they in turn charge fees for services rendered or expect some alternative form of compensation for their involvement (Asian Development Bank, 2008). This could come in the form of direct payment, interest earnings or as some type of tax incentive such as an exemption, reduction, or credit.

Efficiency is also an issue. Private firms are structured to maximize profit, services, and operational efficiency. Therefore, the sustainability and efficiency of the infrastructure will be enhanced. Although this framework for understanding incentives is slightly different in the case of the I-73/74 NHS Corridor, the general premise behind incentives for participation and efficiency effects is still applicable. International experiences have shown that with time, adjustments in policy and practice, the recent adoption of safety, environmental and other value-for money principles for P3 projects and the public sector's contractual regulation of private

revenues or profits have helped minimize this concern (Brown et al., 2009). The effort of the private entity to maintain the roadway at the end of the agreement is also a concern. To mitigate this risk, several states have experimented with performance-based warranties that give the private contractor flexibility in how to complete a project in exchange for an agreement to meet overall specifications and provide a long-term warranty for the work. Aspen, Colorado has used warranties for road resurfacing as well as Ohio, New Mexico, Michigan, Washington and Arizona all entering into warranty agreements (DLC, 2008).

Tolling is another topic that is heavily debated among the public, particularly on a roadway where no tolls existed prior to the infrastructure provided by the P3. However, studies have shown that "toll fatigue" exists, which constitutes public resistance to a toll road and has more to do with the fundamental source of the opposition such as confusing a P3 with privatization or overall disagreement with the outcomes rather than who is providing the service (Brown et al., 2009). Highway P3s typically allow the private operator to raise tolls in accordance with provisions such as frequency or percentage increase as outlined in the contract sometimes on an annual basis with or without prior approval (GAO, 2008). The ramifications of using tolls or even enacting an increase in the toll can negatively influence the public perception of a project or facility and risk loss of support.

Often the public compares or confuses privatization and P3s; however there is a considerable difference between the two. Brown et al. (2009) define privatization as transferring the ownership of an asset to the private sector governed by a regulatory body and a P3 as a service arrangement between the public and private sectors governed by contracts and the accompanying body of law. However, Savas (2005) maintains that using the term "public-private partnership" is malleable as a form of privatization and avoids the inflammatory effect of privatization on those ideologically opposed. Whether or not the public considers a P3 as privatization, the benefits can be realized and supported.

Permits and Other Regulatory Hurdles

In addition to the lack of state and local legislation encouraging their use, environmental review requirements, labor and employment laws and public procurements standards are all issues that can cause problems to a potential P3 (NCHRP, 2009). A significant number of states do not have legislation that authorizes the use of non-traditional project delivery methods for highway projects. As of July of 2008, only 23 states had legislation authorizing P3s and in some cases state law only authorized forms of innovative contracting but did not explicitly authorize state or local entities to engage in long-term lease or other innovative financing transactions (NCHRP, 2009). Several states mandate that projects are to be limited to a specific type, location or place restrictions on the modes of transportation eligible for P3 participation. West Virginia Code pertaining to P3s establishes the opportunity to enter into contractual or joint venture agreements with a nonprofit corporation for the purposes of the economic development of West Virginia, and funded from sources other than the state (WV, 1985).

One of the largest legislative roadblocks to the use of P3s for highway infrastructure occurs with restrictions on mixing public and private funds. The scope of highway projects can be so large that the amount of funding required is substantial and limiting any opportunity to secure funding can be a serious crutch. In order to remedy the issues with legislature or lack thereof, the USDOT has provided a template for states to use when considering the use of a P3 to expand or create highway infrastructure. The USDOT Model Legislation statute contains specific provisions that authorize the receipt, evaluation and acceptance of proposals to enter into P3 arrangements for the development, financing, maintenance, or operation of a highway or other transportation facility (NCHRP, 2009). Based on a survey of existing state statutes that authorize P3 initiatives, the purpose of the model P3 legislation is to provide States with an example of what basic elements to consider and address in P3 authorizing legislation (FHWA, 2010).

P3s are also required to follow all laws that would apply to any other federal or federally-assisted project. These projects must follow design specifications and meet minimum design standards as well as stringent procurement laws related to engineering, design and construction services and the purchase of materials. As for the actual construction of the project, labor and employment laws are no exception. Nondiscrimination, the labor selection process and payroll are all components of the hiring process that are monitored and mandated (USDOT, n.d.). A few of the federal labor requirements include full compliance with the Davis-Bacon Act which increases costs by requiring contractors and subcontractors to pay prevailing wages on federally funded or assisted construction projects in excess of $2,000 and the Buy America Act requiring all Federal construction contracts performed in the United States to use domestic construction materials (DMJM Harris/AECOM, 2007).

A critical part of any highway project, environmental review obligations are often extensive, time-consuming and may threaten a project's budget if environmental challenges are raised through litigation (NCHRP, 2009). As awareness of the environment and the urgency for "greener" forms of transportation modes increases, potential P3s will face substantial pressure to meet strict environmental standards. Completing the environmental review and obtaining the necessary permits and approvals can be a time consuming process. Although many environmental regulations exist, only a few are applicable to the corridor. The Clean Air Act requires the DOT to ensure that Federal funding and approval goes to those transportation activities that are consistent with air quality goals. It must be proved that the total emissions projected for a long-range transportation plan or transportation improvement program are within the limits established by the air quality plan or State Implementation Plan and that transportation control measures are implemented. The project must also show that the new highway project will not cause new air quality violations in areas that are already out of compliance (USDOT, n.d.).

Regulated by the U.S. Army Corps of Engineers (USACE), the Clean Water Act requires a Section 404 permit whenever a project discharges dredged or fill material into certain bodies of

water and wetlands. The USACE further defines their jurisdictional waters as navigable waters, their tributaries and adjacent wetlands and may include ephemeral, intermittent and perennial streams, wetlands, lakes and ponds. Fill material constitutes material placed in waters of the U.S., where the material has the effect of replacing any portion of the water with dry land or changing the bottom elevation. All projects involving the discharge of dredged or fill material require authorization from the USACE (CWA, n.d.). Permits for storm water runoff for construction projects of a certain size are also required (USDOT, n.d.). Federal agencies are required to ensure that their actions will not likely jeopardize the continued existence of any threatened or endangered species and will not adversely modify any critical habitat by following all facets of the Endangered Species Act (USDOT, n.d.). Noise prior to, during and after the completion of the highway project is no exception as 23 U.S.C. 109 (i) requires noise studies and abatement procedures. Each highway project is subject to a noise impact analysis, determination of mitigation measures and reasonable and feasible ways to reduce or eliminate noise impact.

Review of P3 Project Experience in the U.S.

There has been much discussion of P3s for improvements in infrastructure in the State of West Virginia. The "Red Jacket" project and the Mercer/Summers Regional Water Project are good examples of successful P3s in West Virginia and the future progress of the I-73/74 NHS Corridor promises to provide the state with an additional success. States such as Illinois, Indiana and Virginia have participated in P3s and the results only encourage the potential use of P3s for transportation infrastructure. In October 2004, the City of Chicago entered into a 99-year lease with the Macquarie and Cintra consortium for control of the Chicago Skyway. The city was able to pay down outstanding debt, create a reserve fund and provide immediate budget relief with the $1.83 billion received. In a similar situation, Macquarie and Cintra took control of the Indiana Toll Road by paying $3.8 billion for a 75 year lease. Indiana took advantage of this agreement and allocated much of the money towards road projects and the payment of existing bonds.

Chicago Skyway

In 2004 the City of Chicago faced a budget deficit and was struggling to find a way to maximize its assets. Included among the assets was the Chicago Skyway, a 7.8-mile toll road connecting Interstate 94 and Interstate 90. In October 2004 the Macquarie and Cintra consortium bid $1.83 billion for a 99-year lease, took control of the Skyway in January 2005 and began the process of gradually increasing the tolls until 2017. The city used the upfront payment to pay down outstanding debt, create a reserve fund, provide immediate budget relief and fund other non-transportation related programs (PEW, 2009).

Indiana Toll Road

In order to rectify a $1.8 billion shortfall to build necessary road improvements the state of Indiana decided to lease the state's toll road, the Indiana Toll Road (ITR) a 157-mile portion of Interstate 90. Taking control of the ITR in 2006, the consortium of Macquarie and Cintra paid $3.8 billion for a 75-year lease contract which requires them to maintain the road and meet the specified level of service or risk turning the asset back to the public sector at zero cost. With the

funds obtained from the P3, the state allocated money towards road projects, paid off existing toll road bonds and established two transportation project funds. Macquarie and Cintra committed at least $4 billion in improvements over the span of the lease and announced a $250 million toll road expansion to be completed by 2010 in addition to the introduction of electronic tolling along the ITR (PEW, 2009).

I-73/74 NHS Corridor

Of all the various ways P3s are developed, the West Virginia model for the I-73/74 NHS Corridor is considered to be an innovative approach according to the Federal Highway Administration (FHA, 2010). The approach to financing includes using coal mining companies to facilitate the construction of the rough roadbed for the highway. This option exists because the coal resources lie in the proposed path of the new highway system. Instead of instituting the typical practice of reclamation to Approximate Original Contour (AOC) following coal extraction, WV authorities have in the past and are currently proposing a plan for Post-Mine Land Use that would result in the construction of the roadbed for the highway. This method will avoid moving the same material twice and save substantially on roadway construction costs. The I-73/74 NHS Corridor project is the only relative example to this type of innovative financing, and therefore it has become the model followed in potential P3 agreements in other states like Virginia.

This arrangement has previously been characterized by a private negotiated agreement between a mining authority and the WV Department of Transportation. The "Red Jacket" project in Mingo County was the first case for this type of financing along the I-73/74 NHS Corridor. In 2007, six miles of rough grade roadbed was built by Alpha Natural Resources (ANR) of Abingdon, VA, during the reclamation process. The site creates 1,500 usable acres of developable land, which contains 75 acres for Mingo County Consolidated High School that will accommodate approximately 850 students, in addition to the roadway grade. When the Red Jacket project is completed it will cover 11.37 miles of the I-73/74 NHS Corridor and reduce construction costs by more than $170 million, an estimated savings of 50 percent. An important piece of information regarding this arrangement is the fact that ANR did not request or receive any tax or liability concessions for their involvement in the project.

The Red Jacket project included innovative financing provisions based on the value of the coal that was extracted, and a cost-sharing plan where state and local governments agreed to provide funding. However, if the price of coal increased, it was agreed that the public subsidy would be reduced. This did in fact happen due to the "run up" in coal prices after the agreement was signed and the subsidy was reduced which allowed the project to be completed for around $90 million, the lower end of the subsidy estimate (Smith, n.d.).

By placing excess materials from the mining process in strategic locations in order to build the roadbed, the cost savings for the "Red Jacket" section are estimated to be around $150 million (Smith, n.d.). Environmental approvals for the entire corridor have also been provided, and it has been divided into 11 operationally independent sections. It is important to note that some regulatory agencies appear to be more willing to allow coal extraction when there is a productive use for the excess material that comes as a by-product of the removal process. Therefore, producers of coal may see it as an advantage to participate in this arrangement because it allows them broader mineral removal rights (Smith, n.d.). They can also offer input for the alignment of the highway to allow for good access to coal-rich areas. The government, on the other hand, justifies allowing the coal removal on the basis that the highway itself is considered to be a constructive public benefit.

Going forward, CONSOL Energy, Inc. (CONSOL) has also entered into a P3 concerning I-73/74 NHS Corridor construction at the Buffalo Mountain site in Mingo County that will result in five miles of rough roadbed for the corridor, with an estimated savings of more than $110 million. CONSOL has begun the process of the necessary permits and it will then take six to eight years to remove the coal.

The Mercer/Summers Regional Water Project

Located between the cities of Hinton and Princeton, WV, and overlooking the Bluestone Gorge, Pipestem State Park offers lodges, cottages, campgrounds, various seasonal activities, golf courses, restaurants and conference facilities year-round. The mountainous terrain that separated Pipestem from both Hinton and Princeton made getting water to the state park a difficult and costly venture thus affecting business as guests were being turned away due to the lack of available water. Realizing that the necessary infrastructure would not only benefit the state park but also the two Southern, WV cities, Hinton and Princeton, the counties of Mercer and Summers, the Oakvale Road Public Service District, the West Virginia-American Water Company and several state agencies entered into the largest P3 in West Virginia history. The West Virginia-America Water Company constructed a 5 million gallon-per-day state of the art water treatment plant and intake structure while the public agencies provided 21 miles of transmission lines and 42 miles of distribution lines. The total cost of the project was over $44 million, which included an initial investment of $23 million by the West Virginia-American Water Company, a $14.7 million public sector loan and $7.1 million in grants from various local, state and federal agencies (USCM, n.d.). Completion of this project included benefits such as providing reliable water to over 45,000 residents, 5,000 of which were given quality water for the first time; creation of tax revenue due to the company's investment; and commencement by Pipestem State Park of a $10 million expansion (USCM, n.d.).

Coalfields Expressway

In September 2002, the Commonwealth of Virginia announced plans for the Coalfields Expressway (U.S. Route 121), a 51-mile highway running through the coalfields of southwest Virginia. Designated as part of the National Highway System, the Coalfields Expressway will

link Interstates 64 and 77 in West Virginia with U.S. Route 23 in Virginia (VDOT, 2009). The mountainous terrain of southwest Virginia proves to be a formidable opponent to the creation of the roadway and ANR has agreed to provide much needed assistance. In 2006 ANC and Pioneer Group, a subsidiary of ANR reached an agreement with the Commonwealth of Virginia to use their coal recovery efforts to assist in the creation of roadbed for the Hawk's Nest portion of the project (VDOT, 2006). It is estimated that the state will save approximately $90 million as ANR and Pioneer Group will create the roadbed for only $10 million (VDOT, 2008). The innovative P3 approach established for the KCH provided a model to assist in the planning of the Hawk's Nest project and will ultimately bring the project to fruition.

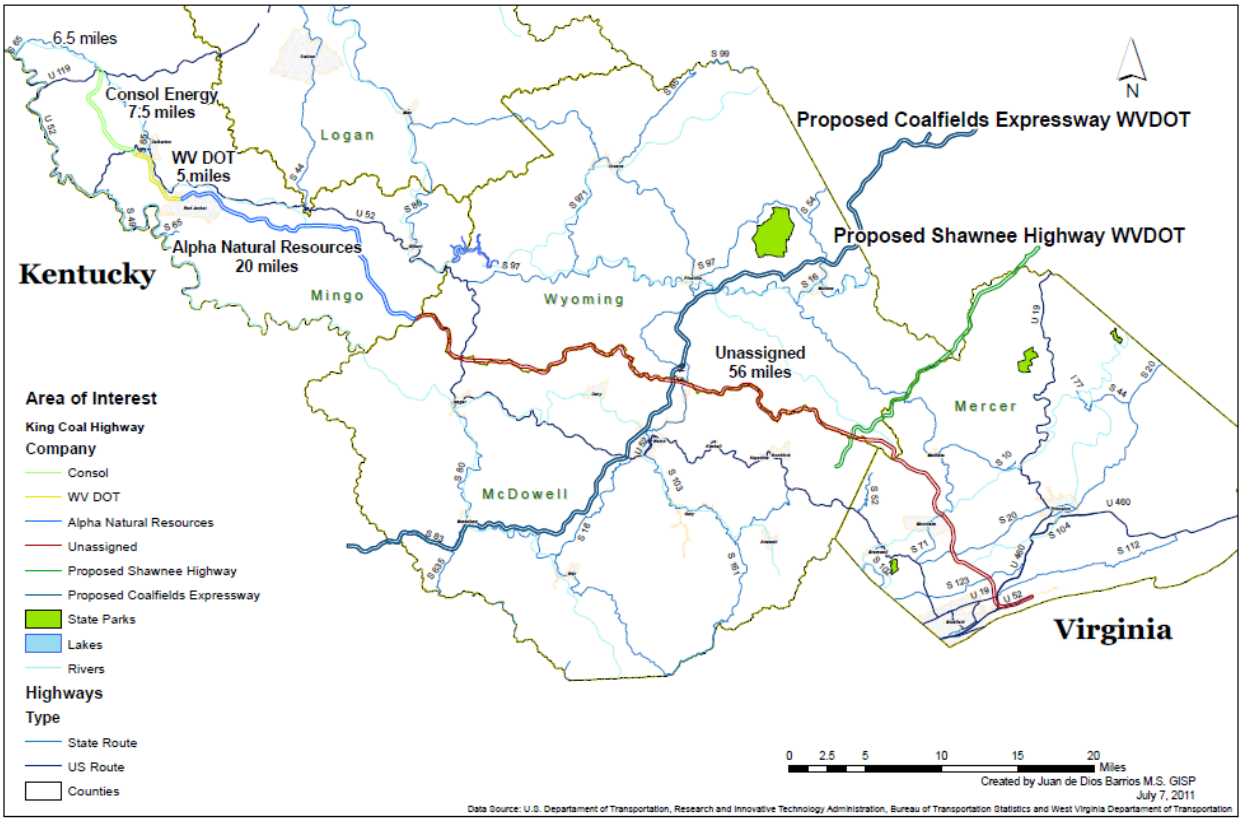
CHAPTER 3: OVERVIEW OF THE I-73/74 NHS CORRIDOR

Extending approximately 95 miles from Williamson to Bluefield and intersecting with the Coalfields Expressway at Welch, the King Coal Highway (KCH) has been designated as a high priority segment of the "I-73/74 North-South Corridor". Composed of two sections, The Tolsia Highway and The King Coal Highway the goal of the "North-South Corridor" is to serve as a multi-lane replacement of the existing US 52 alignment. The KCH has received numerous Congressional funding appropriations and has been identified as a committed project in the state's six-year Highway Improvement Program (WVDOT, 2007).

The northern portion of I-73 in West Virginia is known as the Tolsia Highway, which is the widening of 57 miles of US 52 from south of I-64 in Wayne County to US 119 in Mingo County. In 1998, the Prichard bypass of the TOLSIA Highway was opened, with an extension completed in 2002. Further construction occurred when a section just north of Crum, WV extending to county route 2 was completed and in June 2011, Wayne Concrete Company Inc. was awarded a $6.5 million contract through the Division of Highways to construct a new bridge on the TOLSIA Highway. Once completed, the bridge will carry east bound traffic along U.S. Route 52 to aide in the development of the Prichard Intermodal Facility in Wayne County (WV.gov, 2011).

The northern end of the Tolsia Highway begins at I-64 in Wayne County and extends south, following the alignment of US 52 proceeding west and eventually crossing US 52 with an interchange. From the interchange the Tolsia Highway proceeds south to an interchange at County Route 8 before crossing Cedar Run Road (County Route 7/1) and Sharps Branch Road crossing over Whites Creek before connecting with US 52 one mile south of Co. 18 and staying on US 52 until Co. 20. The Tolsia Highway then leaves US 52 and runs west and parallel to US 52 then intersecting US 52 and WV 37 at Fort Gay. From Fort Gay the route heads south crossing Mill Creek, passing Co. 36 and crossing Vinson Branch Road (County Road 29/4) at Vinson Branch before proceeding south following US 52 until it reaches a new location east of Crum. After Crum, the Tolsia Highway heads towards Kermit and curves back to rejoin US 52 near Kermit to Tunnel No 1, located near Upper Burning Creek. The Tolsia Highway continues to follow US 52 through Naugatuck and leaves US 52 to the east and briefly rejoins US 52 before interchanging with US 119 at the end of the Tolsia Highway (Chmura, 2009). To date, $154.8 million has been spent on design, environmental studies and contract plan development and only six miles of the Tolsia Highway has been completed. DOH officials report that design is near completion on an additional 23.7 miles however, $693.8 million is required to complete the project (WOWK, 2009).

Figure 3-1 King Coal Highway Route



The Federal Highway Administration promulgated a final decision of the location of the King Coal Highway (KCH) in 2000, allowing design to begin. The KCH/I-73 starts in Mingo County at the intersection of US 52 and US 119 north of Williamson, West Virginia. I-73 follows US 119 to the east of WV 65 near Belo, WV and at this point proceeds south then east crossing Buffalo Mountain and US 52. As it continues east it passes to the South of Delbarton, running parallel to US 52 to the north. I-73 then crosses over Mingo County Route 9 passing south of Coon Knob, Hampden, Sharon Heights and then turning south crossing Mingo County Route 10 near Twisted Gun Gap. Eventually crossing the Mingo, McDowell and Wyoming County Lines, I-73 follows Indian Ridge to Crumpler passing over Flat Top Mountain and paralleling Pinnacle Creek and Mercer County Route 11. East of the Bluestone River, I-73 parallels Sandlick Creek, continues east crossing WV 20 and Mercer County Routes 23 and 36 before veering south where it crosses US 19 and US 460 to the intersection with US 52 northeasterly to its terminus at the US52/I77 interchange (Chmura, 2009). The approved route is expected to greatly reduce travel time and provide a more efficient transportation facility.

Based on estimates in our study, the entire 95-mile four-lane, divided, partial-access I-73/74 NHS Corridor project is estimated approximately $3.9 billion. The corridor would connect smaller communities such as Williamson, Gilbert, Iaeger, Welch, Keystone, Northfork, Bramwell and Bluefield (Figure 3-1). The KCH will ultimately end at interchange 1 just north of

the Virginia state line connecting with I-77 and passing between Bluefield on the east and Princeton on the west (FHWA, 2003).

I-73/74 would not have been possible without the passage of state and Federal initiatives that emphasized investment in transportation. The goal of establishing a National Highway System furthered the development of many roadways and highway, including the KCH.

The first piece of legislation that provided West Virginia with an opportunity to pursue I-73/74 was the Intermodal Surface Transportation Efficiency Act (ISTEA) enacted by Congress in 1991. Signed into law by President George H.W. Bush, the purpose of the act was to develop a National Intermodal Transportation System that is economically efficient, environmentally sound, provides the foundation for the nation to compete in the global economy, and moves people and goods in an energy efficient manner (FHWA, 1991). Provisions of the act aimed to establish a National Highway System focus Federal resources on roads that are most important to interstate travel and national defense. Other important provisions pertaining to highways included allowing state and local governments more flexibility in determination of transportation solutions, the funding of new transportation technologies, and giving the private sector the freedom to act as a funding source for transportation improvements (FHWA, 1991).

The NHS Designation Act of 1995 provided for the actual designation of the National Highway System within the United States as well as the District of Columbia and the Commonwealth of Puerto Rico. Provisions of the Act also included greater funding flexibility by making Federal-aid highway program categories more flexible, reallocating funds from certain programs to State core transportation programs, ensuring fair and balanced distribution of funds to urbanized areas and suspending several state-imposed penalties. The NHS contained several miscellaneous highway provisions which included but were not limited to traffic monitoring, quality improvement, toll roads, congestion mitigation, high priority corridors and several safety initiatives (FHWA, 1995).

In 1998 Congress provided technical corrections to ISTEA and extended their support for Federal surface transportation programs by creating the Transportation Equity Act for the 21st Century (TEA-21). TEA-21 provided record levels of investment in improving safety, protecting public health and the environment while creating opportunity for all Americans without cutting education, Social Security and other priorities (FHWA, 1998). The act guaranteed $198 billion in surface transportation investment, which included $28.6 billion for the National Highway System, $23.8 billion for interstate highway maintenance, $33.3 billion for the Surface Transportation Program and $20.4 billion for bridges. TEA-21 remained in line with ISTEA in promoting state and local funding flexibility. The Federal government's dedication to our nation's roadways and the National Highway System assisted in bringing a high priority project such as the KCH to the forefront.

August 2005 saw yet another substantial commitment to our Nation's transportation infrastructure as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law. A total of $244.1 billion was guaranteed in funding for highways, highway safety and public transportation thus building on the foundations established by ISTEA and TEA-21 from prior years. Several components of SAFETEA-LU play a direct role in the investment and progress of the corridor. Among them include the provisions which target investments in safety by establishing a new core Highway Safety Improvement Program which doubles the funding for infrastructure safety, requires strategic highway safety planning and targets areas of concern such as work zones (FHWA, 2005).

A direct impact of I-73/74 is the creation of a safer travel route through the mountainous terrain of West Virginia. Equity and financing are emphasized by a new Equity Bonus Program and increasing the attractiveness of highway infrastructure projects to the private sector (FHWA, 2005). Increasing the role of the private sector in highway infrastructure projects will assist the public sector in realizing the benefits of P3s and I-73/74 provides an excellent example for the innovative approaches that are possible. Addressing mobility and productivity is a key goal of SAFETEA-LU, and the program provides substantial investment in Federal-aid programs and emphasis on funding for critical high-cost transportation infrastructure projects of national and regional significance. SAFETEA-LU provided $30.5 billion dollars in order to improve the National Highway System (FHWA, 2005). Having been dubbed as a high priority corridor with not only regional but national significance, I-73/74 is an excellent candidate to continue receiving Federal funding.

Alpha Natural Resources & CONSOL

Using coal companies to facilitate the construction of rough roadbed for portions of the KCH is an innovative approach that not only benefits West Virginia, but the coal companies as well. The expensive and time consuming process of reclamation following coal extraction can be a significant burden for these companies. The option of grading the land and creating rough roadbed that meets the FHWA and WVDOT standards and requirements is highly effective in fostering significant costs savings for the coal companies as well as cutting costs for the project itself. Two coal companies, Alpha Natural Resources and CONSOL have entered into agreements with the WVDOT and others to facilitate the creation of two sections of the KCH.

Alpha Natural Resources

With locations throughout Virginia, West Virginia, Kentucky, Pennsylvania and Wyoming, Alpha Natural Resources (ANR) is America's number one metallurgical coal supplier and the third largest coal company in the United States (ANR, 2010). In 2009, ANR shipped 47.2 million tons of coal while maintaining 2.3 billion tons of reserve. ANR is the only coal producer with both operations and reserve blocks in both the Powder River Basin and Northern Appalachia, operating a total of 61 mines (ANR, 2010). In 2005, ANR signed purchase agreements to acquire the coal reserves and operations of the Nicewonder coal group for an

aggregate purchase price of $316.2 million (State Journal, 2005). In 2004 Nicewonder had previously agreed with the WVDOT to participate in the creation of the "Red Jacket" section of the KCH, an 11.37 mile portion of the KCH. ANR's purchase of Nicewonder and subsequent involvement in the "Red Jacket Project" created a new framework and methodology for P3s, one that provides substantial benefits to both ANR and the KCH.

The scope of the Red Jacket Project includes the construction of two road systems which consists of graded roadbed and several interchange connectors. The first road system consists of over 11 miles of four-lane roads of the KCH and a two-lane connector road from the KCH to existing US 52 (Figure 3-2). Road System 2 provides various connector roads for access to the KCH. Among these connectors include the North and South Taylorville connectors, the Left Fork Connector, the Pigeon Creek temporary relocation connector and a section of the Beech Fork connector. ANR has assumed responsibility for acquiring approvals or permits as required by governmental agencies and acquiring property necessary to provide the appropriate rights-of-way as well as the costs associated with each (WVDOT, 2004).

ANR also claimed responsibility for mitigation efforts and is contractually obligated to obtain borrow material while providing drainage ways and mitigation structures. The mitigation plan has been proposed to the USACE and calls for the creation of stream segments to offset other stream segments that are impacted by the construction of both road systems and development of other areas pertaining to the KCH. Although ANR has agreed to fund the mitigation of the project, the WVDOT will reimburse ANR for any clearing, grubbing or burning activities necessary for the Red Jacket Project area. Additional reclamation such as seeding and mulching of temporary or permanent vegetation is also reimbursable but only for areas that have been disturbed by the construction of the Red Jacket Project.

The facilitation and creation of appropriate right-of-way for the KCH Red Jacket project cannot be overlooked. ANR and the WVDOT possess similar responsibility in terms of property acquisition as outlined in the contract. During each stage of the project the respective party responsible for acquiring property must provide the appropriate assurances to establish minimum requirements. This includes the determination of any property considered necessary for the project and which requires a title examination to be completed by an attorney. In addition to the title examination, each party must obtain all documents necessary to permit legal entry on the land used.

Additional permits that may be required will be obtained by ANR. A supplemental agreement may be necessary should the need arise for additional compliance due to unusual requirements, such as the development of a new Environmental Impact Statement or compliance with other environmental concerns of the United States Fisheries and Wildlife Service or other affected agencies. The agreement does include anticipated costs for rare, threatened or endangered species surveys; however consultations with the USFWS to discuss mitigation measures should

any of these species be encountered during the permitting or construction phases of the project not included in the initial agreement. ANR has agreed to furnish all of the necessary materials, labor, tools, equipment and expertise needed to build and complete the Red Jacket Project in accordance with all of the plans, specifications and special provisions.

An initial estimate was completed and it was determined that it would take six years to construct and complete the Red Jacket Project. If construction is not completed during this time frame an automatic one-year extension will be granted. After the additional year all parties will meet in order to determine the causes of the delay and outline a supplemental agreement to specify an absolute end date. The WVDOT reserves the right to provide on-site construction specialists to inspect and monitor construction activities; however these inspections will occur at their own costs. Any deficiencies or issues occurring during the construction process will be corrected immediately and any repairs that must be made after the full completion of the project will be promptly corrected by and at the expense of ANR.

Failure for either party to perform as obligated can result in termination of the contract. The WVDOT reserves the right to terminate the agreement with thirty days written notice should any Alpha actions or inactions result in default of the contract. If ANR is unable to correct the default and the agreement is terminated, the WVDOT will pay the Company for all costs incurred and work performed prior to the date of termination. If the WVDOT fails to comply with their end of the agreement, the company holds the same rights and will be reimbursed for any overpayments or work performed prior to the date of termination.

CONSOL/Buffalo Mountain Initiative

One of the world's leading energy companies, CONSOL. is the largest producer of high-BTU bituminous coal in the United States as well as being the largest United States producer of coal from underground mines. The principal activities of the coal unit include mining, preparation/marketing steam coal and metallurgical coal (CONSOL, 2010a). CONSOL employs approximately 3,500 employees in West Virginia and is responsible for 29 million tons of coal reserves in the state (CONSOL, 2010b). Their commitment to private research & development and facilitating creative business options such as establishing a P3 with the KCH allows them to remain a major player in the coal industry while strengthening their hold on the energy sector.

Located in Mingo County, West Virginia, the Buffalo Mountain Initiative's proposed location is partially within and in close proximity to approximately six miles of the King Coal Highway Preferred Alternative Corridor (Figure 3-2). In October 2007, CONSOL entered into an P3 with the West Virginia Department of Transportation, Division of Highways (WVDOH), the United States Department of Transportation, Federal Highway Administration (FHWA), Cotiga Development Company, LP (COTIGA) and the Mingo County Redevelopment Authority (MCRA) in order to facilitate the creation of approximately five miles of line and rough grading for the King Coal Highway as part of the post mine land use. It is estimated that the Buffalo

Mountain Development Initiative will save as much as $110 million in the costs to construct embankments for future KCH construction (WVDOT, 2007).

A unique aspect of this P3 is the number of parties involved in the project. Each entity's level of responsibility for following the applicable rules and regulations pertaining to the environment, design standards and planning is different. However, each role that each party plays is essential for the completion of the project.

The key entity in the P3 is CONSOL as they are chiefly responsible for successful completion and highlights of CONSOL'S contractual obligations. First and foremost, CONSOL is to facilitate an approximate five-mile section of the KCH to reasonable, industry standard and appropriate WVDOH design standards, guidelines and criteria. CONSOL will provide the WVDOH with reproducible copies of the line and grade plans for review and approval, prior to line and rough grade construction work. CONSOL will also provide project-specific environmental data to the FHWA and WVDOH to use in the environmental impact statement (WVDOT, 2007). All applicable federal, state and local environmental regulations will be followed. Among these regulations are Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material into water (FWS, 2010); Section 106 of the National Historic Preservation Act, which requires Federal agencies to take into account the effects of their undertakings on historic properties (ACHP, 2010); Section 7 of the Endangered Species Act, which provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range and the conservation of the ecosystems on which they depend (OPR, 2010); West Virginia State 401 Water Quality Certification; and all pertinent requirements set forth in the Surface Mining Control and Reclamation Act of 1977. The agreement also provides that CONSOL will secure the approvals and permits not explicitly stated in the agreement but that are necessary for the successful completion of the project.

As for the WVDOH, they are responsible for the preparation of an environmental reevaluation of the 2000 King Coal Highway FEIS for any shifting in alignment or other Federal actions, provide staff to review CONSOL's preliminary and final line and grade and right-of-way plans, inspect construction work to ensure compliance, acceptance of the roadbed into the State Road System and coordination with CONSOL and MCRA in locating the rights of way and easements required for utility development.

The FHWA is to conduct a reevaluation of the 2000 KCH FEIS based on information provided by CONSOL and in accordance with 23 CFR 771 which establishes policy for the consideration of environmental impacts of transportation related projects. Working with the WVDOH, CONSOL, COTIGA and MCRA; the FHWA will identify access locations to be developed on adjacent lands and follow all FHWA regulations for approvals. The FHWA will also participate in meetings concerning surface mine-related provisions of the Clean Water Act (CWA 404 IP).

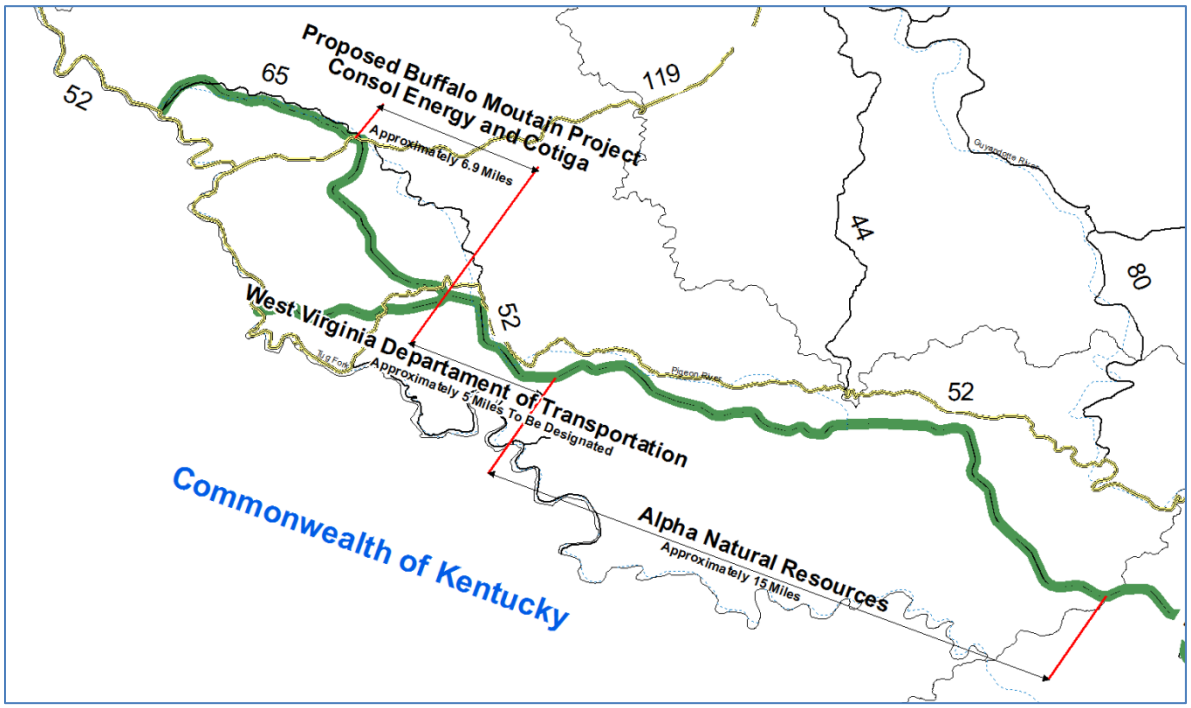
COTIGA agrees to convey to the WVDOH all of the necessary rights of way and easements for the KCH in accordance with plans approved by the WVDOH. These rights of way and easements must be free and clear of all encumbrances with covenants of special warranty following the construction of the rough graded roadbed.

The MCRA is to collaborate with CONSOL and COTIGA to insure that the post-mine land use plan is consistent with Mingo County's Master Land Use Plan in addition to participating in public and agency meetings. MCRA must also coordinate with all parties involved in the KCH to identify access and utility locations to be developed for the adjacent mined lands.

Open communication and teamwork between the parties is extremely important for the successful completion of the Buffalo Mountain project. Each party reserves the right to terminate the contract 30 days after written notification is provided to all other entities (MOU, 2007). If termination does occur, each party is liable for only their performance and costs incurred prior to the date of termination. CONSOL faces the most pressure based on their permitting obligations for the successful completion of the Buffalo Mountain project. If CONSOL is unable to procure any required permit or if any already issued permits are modified in a way which adversely affects the mining project, the contract is terminated and CONSOL has no further duties or obligations. Each expense incurred by each party is their sole responsibility and no other parties will be held liable.

The KCH has a tremendous opportunity to improve travel in West Virginia as well as positively impact the state economically. The Federal government realizes the importance and potential of our Nation's roadways, including the high priority KCH and has made it a goal to further fund transportation infrastructure and projects with legislature such as ISTEA, TEA-21 and SAFETEA-LU. Legislation has made it possible for companies such as ANR and CONSOL engage in P3s and ultimately assist in the KCH, cutting costs for both the coal company and the state while improving the highway system in West Virginia.

Figure 3-2 Red Jacket and Buffalo Mountain Sections of the KCH



CHAPTER 4: POST-MINE LAND USE AND POTENTIAL P3S

Budget concerns and a lack of available funding can provide significant roadblocks to the continuation and overall progress of the I-73/74 NHS Corridor. Fortunately, P3s can assist in completing transportation projects and studies have shown that P3s are able to provide an effective way of meeting public needs while keeping costs low (NCPPP, 2010). The Red Jacket and Buffalo Mountain projects show the benefits of using P3s to facilitate transportation infrastructure, specifically the creation of rough roadbed.

This study reviews coal reserve maps of the route to examine potential for additional P3s with mining companies through the use of Post-Mine Land Use (PMLU) plans. Figures 4-1 and 4-2 display the assigned route of the KCH through Wayne, Mingo, Wyoming, McDowell and Mercer Counties along with coal reserves data obtained from the West Virginia Geological Economic Survey (WVGES). Figure 4-1 includes elevation of the proposed route with the higher elevations in red, while lower areas are represented with green. Both figures show that coal reserves exist in several areas along the KCH route; however there is not enough coal in the southern portion of the roadway to justify the current P3 practice. Without properly incentivizing the reclamation and roadbed construction, coal companies are likely to avoid entering into a P3 to pursue future construction in these areas. Other forms of P3s such as tolls will be necessary because of this. I-73/74 is vital to the economic future of the state, particularly southern West Virginia, and has potential to attract commercial or retail establishments, service industries, residential areas, and agriculture and tourism destinations.

Throughout this chapter, evidence is provided that P3s and PMLUPs can be guarantors of successful development especially in economically depressed areas. The combination is a good example of how public policy works to improve communities while combining the efficiency and expertise of the private sector. PMLUPs are an innovative and essential part of creating new communities and transportation options with private sector help.

Figure 4-1 Coal Reserves along the KCH

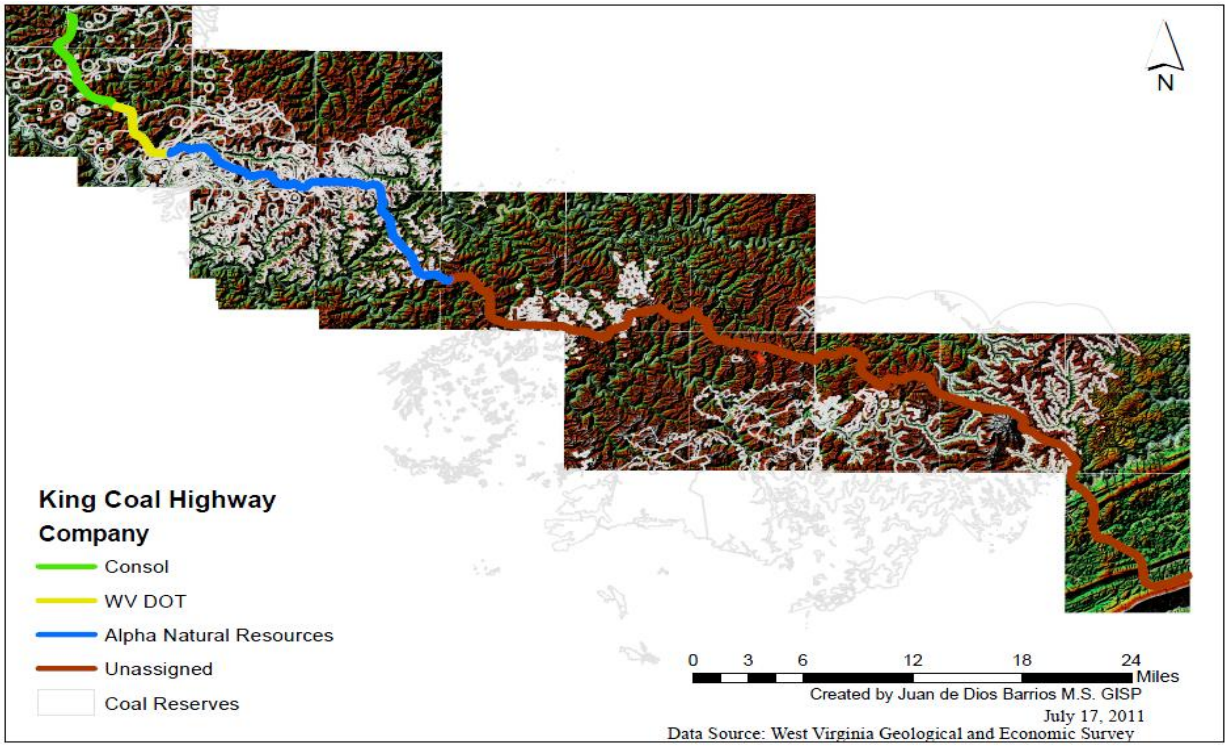
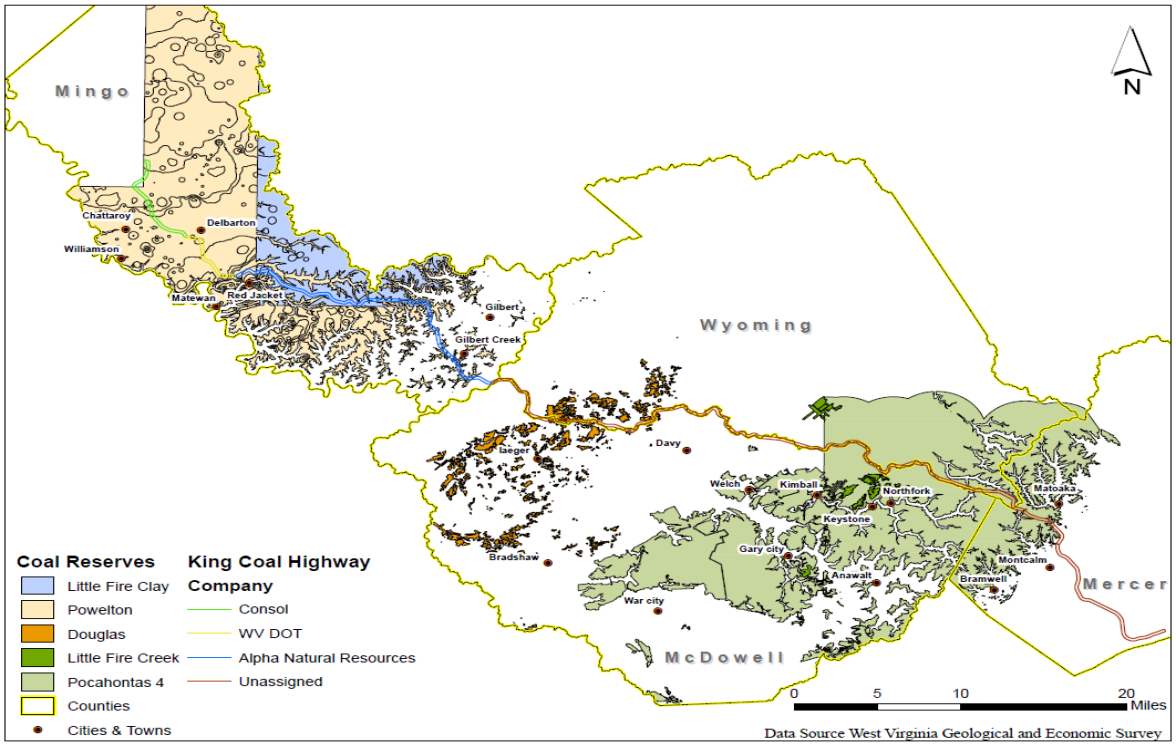


Figure 4-2 Coal Reserves Along the KCH



Governor's PMLU Task Force

Realizing the tremendous need for post mine land use direction, the governor established the Post-Mine Land Use Redevelopment Group/Task force. A June 2009 report issued to Governor Joe Manchin III outlined recommendations for post mine land use in West Virginia[1].

Land Use Master Plans

The task force recommends having the Governor charge the Office of Coalfield Community Development (OCCD) to establish three future pilot sites for development to determine what types of plans would be successful. A review and analysis of previously mined sites should be conducted by the OCCD to gauge the feasibility of PMLU on these sites.

Dissemination of Information to the Community

The task force established a variety of requirements for PMLU to insure clear communication and information sharing. All counties should have PMLUMP with consistent and inclusive standards including:

- Timelines with commitments
- A listing of those who must be present in the development of plans.
- Public involvement with recent guidelines and standards.
- Market studies for possible economic development ideas
- Natural resource data including coal reserves, gas lines, wells and timber.
- Planned roads
- Water lines, sewer lines and broadband
- Possible sources of funding.

The task force also recommends streamlining government agencies, developing a process for the Division of Highways to build roads in conjunction with mining, formulating a process or template for post mine land use stressing plans that encourage growth out of floodplains. The plans must be sustainable in any given market while addressing land use and economic reality.

Infrastructure

The Infrastructure Committee first recommended adding a mandate to the mitigation requirements for project impacts to waters of the United States to require a certain sum of capital to be set aside for new or improved infrastructure was recommended. However, the regulatory climate surrounding Corps permits and mitigation is very unpredictable; therefore, the task force recommends further research of this mandate. Anytime infrastructure is added, there will be a resulting increase in property values. The governor should continue to encourage county leaders to offer to defer the increase in property tax for a specified number of years and require an upfront payment.

[1] *Post-Mine Land Use Redevelopment Group Recommendations*, July 1, 2009.

Regulatory Challenges

Senate Bill 1011, passed in June 2009, amends the West Virginia Code by requiring surface mine reclamation plans to comport with approved master land use plans and authorizes surface mine reclamation plans to contain alternative post-mining land uses. The bill does not guarantee that development of infrastructure such as highways, water, sewer, and telecommunications will occur after the land is flattened. The task force summarizes remaining issues and makes specific recommendations for successful PMLU development in West Virginia. The OCCD should take the lead in sponsoring workshops, seminars and other educational opportunities to inform and educate on PMLUMP. Both the West Virginia Department of Environmental Protection (WVDEP) and OCCD should develop a PMLU handbook for landowners, citizens, localities and coal companies. Training sessions should be held in order to educate all users of the PMLU handbook and assist in the elimination of further questions and issues. Annual meetings of the task force should be scheduled to maximize its potential, as well as reviewing processes and offering recommendations.

Transportation & Housing

Potential PMLU projects should focus on possible transportation facilities for all modes and connectivity to the existing transportation system as well as utility needs and future development sites. Funding is paramount and alternative funding methods should be examined for potential transportation and utilities upgrades. Housing proposals should consider the involvement of the local community as well as a complete evaluation of the appropriate market. Resources should be pooled and periodic updates to the PMLUMP will be necessary.

Planned and Completed PMLU

Mingo County: A Post-Mine Success Story

PMLU projects in Mingo County show the benefits of successful post mine land use. Investments and jobs have brought a considerable amount of money to the economically depressed area. Mingo County benefits from the Appalachian Development Highway Corridor G which extends from Huddy, KY, east-northeast to Charleston for approximately 81 miles. Further development on the land surrounding Corridor G as well as the I-73/74 NHS Corridor is important for economic growth and long term prosperity.

The Mingo County Air Transportation Park is located on land within a close proximity to the roadway and will provide not only for air transportation needs but future economic development as well. The park will increase the attractiveness of the area for future businesses and further commercial development. The air transportation park is being constructed on post mine land and was made possible by entering into a P3 with Alpha Natural Resources. Once completed, the park will serve private, corporate and industrial aircraft customers in the region. The 900 acre site was donated to the Mingo County Redevelopment Authority at no cost to the taxpayers as Alpha took on the task of basic site development (Hamilton, 2009). According to the Mingo

County Redevelopment Authority, the new airport will boast a state of the art 7,000 foot runway, lighting and instrumentation along with an additional 800 acres of developable property. Mingo County hopes that the additional 800 acres will assist in bringing more business and industry to the region (MCRA, n.d.). Although the true economic impact has not been estimated, the Air Transportation Park is expected to generate 25 new jobs (Sammons, 2007). A PMLU site adjacent to the Air Transportation Park is configured for housing, commercial and light industrial; however $5 million is needed for utility infrastructure. The park is still under construction.

A system of over 500 miles of trails across post mined lands, the Hatfield McCoy Trails opened in 2000 and are known as one of the top multi-use trail systems and the second largest recreational vehicle trail system in the country having brought in visitors from over 50 states and 10 foreign countries. Creating 25 jobs, the trails have had an economic impact of $7.7 million since their inception (MCRA, 2011). Future plans call for the addition of 2,000 miles of trails in the long term with appropriate facilities and amenities in all nine counties in addition to an Off-Highway Vehicle Park to be built in Kanawha County. The immediate goal is to increase from 500 to 1,000 miles. Since opening in 2000, 44 new places of lodging, two ATV dealerships, numerous restaurants, gift shops and other small businesses have been built. Creating and fostering a tourism industry is one of the main goals of the trail system; statistics show that 87 percent of the riders are from out of state (Sanda, 2010). Since the trails were first opened, users have increased to 24,285 in 2005 and 32,842 in 2009. The I-73/74 NHS Corridor could also support the facilitation of an ATV park or other projects similar to the Twin Branch Motorsports Complex, a proposed facility which will seat approximately 20,000 spectators and include camping and parking for more than 6,000 vehicles on a 55 acre site about 15 miles north of Williamson.

According to the Mingo County Redevelopment Authority (MCRA), several PMLU projects are planned and/or underway. TransGas has proposed a $3 billion Coal-To-Liquids Plant in Mingo County as part of a PMLU which will produce 750,000 gallons per day of ultra-clean Premium 92 Octane gas using only 8,300 tons of low quality coal. This project will create approximately 1,500 three year construction jobs and an estimated 300 permanent jobs with an estimated 300 additional jobs in services directly related to the facility. During construction, approximately $1 billion will be spent on steel, concrete and supplies. As of July 2011, the Department of Environmental Protection is reviewing the phase one permit application for the plant. The coal-to-gasoline facility is thought to be the first in the nation and the largest of its kind in the world (WVDOC, 2010).

A $30 million capital investment was used to transform 650 acres of a Brownfields location into a feasible job producing site, now known as the James H. "Buck" Harless Wood Products Industrial Plant. The first phase of development occurred in 2001 when a 40 acre site was developed for a hardwood flooring plant, dry kiln and inventory facility for International

Industries, Columbia Flooring and Glen Oak Flooring (Grass, 2000). In 2007, Mohawk, Inc. purchased the hardwood flooring plant, dry kiln and inventory facilities but, since the opening in 2001, both Columbia and Mohawk have invested an additional $15 million in capital improvements and employing 266 individuals. The second phase of development was completed in 2005, which created 80 acres ready for immediate occupancy but required a $3.2 million capital investment. It is important to note that had these sites been developed as PMLU, there would have been very little capital investment required.

In addition to the aforementioned projects, Coal Mac, Inc., a subsidiary of Arch Coal, Inc., has been using former coal buildings for expansion, keeping 35 jobs in Mingo County. Wright Concrete, Wood Park's newest business, specializes in concrete construction for the mining industry and established a new batch plant on an eight acre site in 2009 and has begun construction on a 10,000 square foot regional office building at Wood Park. Wright Concrete has provided 80 jobs to the area and will add 15 new jobs once they begin offering bagged concrete mix to their product line (MCRA, 2011).

The last PMLU project for the next few years in Mingo County will be the creation of the 4-H Youth Camp. Developed by a partnership with Trinity Coal Company, Pardee Land Company, Mingo County Commission and the West Virginia University Extension Service, the youth camp will provide swimming, fishing, baseball, basketball, soccer, track and other recreational facilities. This project is estimated to create 20 jobs. Projections show that PMLU in Mingo County is estimated to create an additional 940 direct jobs (Table 4-1). These jobs, as well as future opportunities, are made possible by the growth and development of I-73/74.

Table 4-1 10 Year Projected Job Growth on PMLU Sites in Mingo County (By Year 2020)

Project	Projected Employment
TransGas Coal To Liquids Plant	300
Air Transportation Park	25
American Clean Energy Wood-to-Electricity Plant	80
Wright Concrete Bagging Facility	15
4H/Youth Camp	20
King Coal Highway Growth Corridor (Misc.)	500
TOTAL – Projected Direct Jobs	940
TOTAL – Projected Indirect Jobs (multiplier 2)	1880

Sources: Mingo County Redevelopment Authority, 2010; Mingo County Redevelopment Authority, 2011

Hatfield-McCoy Trail Extensions

The Hatfield-McCoy Trails System (HTMS) winds through many of the counties directly affected by the construction of the I-73/74 and provide over 500 miles of off-highway vehicle trails to many off-highway vehicle enthusiasts. The HMTS hopes to expand the trails to 1,000

miles in the short term and an eventual 2,000 miles while adding multiple connecters to the trails already in place. Considering much of the HTMS is located in several of the I-73/74 counties, the possibility of using surrounding land for trail upgrades should be studied. The addition of several trailheads to the areas surrounding I-73/74 would bring more traffic to these locations and provide a boost to the local economies. Since the opening of the trails in 2000 there have been 44 new establishments for lodging, two ATV dealerships, numerous restaurants, gift shops and other small businesses (Sanda, 2010).

Potential PMLU

Distribution Centers

According to Chmura Economics and Analytics (2009), interstate highways are a desirable location for distribution centers due to the increasing popularity of internet commerce and the demand for faster inventory replenishment. Large retailers tend to locate their distribution centers close to major population centers for easy access to potential markets. However these locations typically are in areas with smaller population and relatively cheap real estate. Locations with a population density below 500 people per square mile are ideal.

All counties along the route of I-73/74 are in rural areas with a population density under 200 people per square mile. Wayne and Mingo County are located within a one-hour drive to Huntington and Charleston and within a three-hour drive of Columbus and Cincinnati giving distribution centers in these counties access to the Midwest markets. The counties on the eastern segment of the corridor will be able to provide easy access to markets in Virginia and North Carolina. The economic impact of a distribution center would be substantial as on average distribution centers employ 200 workers and can directly generate approximately $18 million in economic output in 2020. The jobs created by a distribution center could generate an estimated $13 million in employee compensation in 2020 (Chmura Economics & Analytics, 2009).

Agri-Tourism/Aquaculture

Research of a potential equestrian park/event center in Mercer County has prompted discussion of agricultural options in many areas of West Virginia. Commonly referred to as “agritourism”, this term describes the act of visiting a working farm or any agricultural, horticultural or agribusiness operation to enjoy, be educated or be involved in activities (AGMRC, n.d.). Nationally more than 52,000 farms are engaged in agritourism activities and West Virginia currently offers more than 250 agritourism activities (Wv.gov, 2011). Examples of agritourism include farm tours, day camps, hands-on chores, self-harvesting of produce, hay or sleigh rides, hunting leases, rural weddings, wine tours and others. Several of these offerings could be tailored for an area within a close proximity to the corridor. Among the 55 counties in West Virginia, Mercer County ranks 24th in total value of agricultural products sold and both number of farms and market value of products sold increased between 2002 and 2007 (USDA, 2011). Through grants and support offered by the United States Department of Agriculture’s Federal State Market Improvement Program and the West Virginia Division of Tourism’s Matching

Grant program, many agritourism initiatives can be explored and perhaps implemented (Wv.gov, 2011).

Another feasible option for the land surrounding the roadway is the pursuit of aquaculture projects to aid in fulfilling the demand for fish in the food supply. A 2.5 acre parcel of post mine land was donated by Pocahontas Land Company to Mingo County in 1999 in order to initiate the construction of a fish hatchery which currently produces up to 320,000 Arctic Charr each year (MCRA, n.d.). Aquaculture is growing and is expected to continue its growth in the United States as shown by the rising Aquacultural production to nearly $1.1 billion. Worldwide aquaculture remains the fastest growing food-producing sector with a value of $78.8 billion in 2006 (Burden, 2010). After 20 years of mining, Eastern Coal Company and West Virginia University combined their efforts to establish a location for aquaculture. Water analysis indicated that no treatment was necessary for trout production and two buildings with office space, locker rooms and a large garage for machinery were built on the former Robinhood #9 mine site. Testing confirmed good survival and growth of rainbow trout and the PMLU project allowed Eastern Coal to save an estimated $450,000 in reclamation costs (Miler et al., n.d.) Additional aquaculture locations in West Virginia could create jobs and increase the inflow of money into the state as the demand for fish grows not only domestically but also abroad.

Recreation and Culture

Wyoming County understands that their county lacks flat developable sites for commercial, industrial and residential usage. Unfortunately large landholding corporations own a large percentage of the land suitable for development. The Wyoming County Economic Development Authority (2009) suggests focusing on recreation such as tourism attractions. The presence of Twin Falls State Park, R.D. Bailey Lake and a rich coal history within the National Coal Heritage Area all provide options for future land development (Terrell Ellis and Associates, 2010).

In 2009, Groundwork Wyoming County a locally led non-profit completed a feasibility study and strategic plan with one of the main goals to identify potential projects to be developed in conjunction with the Coalfields Expressway. Among the projects listed for possible development include the "74 Mile Wyoming County Scenic Byway", a proposed 74 mile circular wildlife viewing trail from Maben to Milam Fork to Bolt Mountain to Lester and back to Maben. Using FEMA buyout properties, the trail will include picnic tables and wildlife viewing areas for birding and photography. Wildlife viewing trails have the potential to provide significant economic benefits as wildlife viewing activities in Florida generated more than $3 billion in 2006 (GWCSC, 2009). Wildlife viewing presents an attractive option for post mine land that is not suitable for large scale development.

Recreational and cultural options also bring about a number of travelers and visitors to the state, emphasizing the importance of hotels and lodging options. A lack of lodging severely hampers

growth in the state, and the Hatfield-McCoy trails are an excellent example. In a 2011, Wyoming County Report article Jeffrey T. Lusk, executive director of the Hatfield-McCoy Regional Recreation Authority emphasizes the need for lodging. Growth is being threatened by the lack of lodging facilities and calls are fielded daily about available rooms. According to Mr. Lusk, "anyone with a little land and money to build could stay booked up from April through November" (Brooks, 2011b).

Automotive Manufacturing

Construction of I-73/74 allows many feasible options for the remaining useable land; one with a significant amount of potential is providing land for automobile manufacturing. Site selection takes three factors heavily into consideration; physical conditions, operating conditions and living conditions in the area. As land is contoured and structured to meet the needs of the roadway, other areas of land will be ready for almost immediate use. The automotive sector requires shovel ready sites and while free land is desired, the benefits of using the land surrounding I-73/74 outweigh any particular costs associated with obtaining land (McCallum Sweeney, 2007).

Construction of an assembly or manufacturing plant along the route of the corridor allows easy access for trucks and transportation to these locations. There is a great need for reliable utilities in any commercial project. The roadway could provide access to utilities as a byproduct of road construction thus improving the value of the unused land (McCallum Sweeney, 2007).

Miscellaneous

One option with significant potential is the planning and development of a master-planned community similar to what can be found in Bridgeport, WV along the I-79 high tech corridor. The Charles Pointe community is a $1.4 billion P3 which spans over 1,700 acres and provides commercial, residential and recreational opportunities combined conveniently in one location. In addition to its proximity to I-79, Charles Pointe also maintains positioning adjacent to WV State Route 279 and 131. Current offerings of Charles Pointe not only include residential property but an Exxon station, Buffalo Wild Wings, Microtel Inn & Suites, Fairmont Federal Credit Union and the Bridgeport Conference Center with ample space for further development. Construction is under way to complete the Market Place area which will feature six buildings with more than 230,000 square feet of office, retail and residential space. It is estimated that Charles Pointe will bring 16,935 temporary direct and indirect jobs, 11,232 permanent direct and indirect jobs and a total of $964,595,952 in wages (Genesis, 2008). A community similar to Charles Point, located somewhere along I-73/74 could be an ideal project to provide substantial economic impacts to the region.

Conclusion

Direct involvement in a federally designated high-priority roadway can provide West Virginia with a unique and rare opportunity to substantially improve the economic condition of several communities. The construction associated with the I-73/74 NHS Corridor will create a vast

amount of useable land for a number of commercial uses. Other than the obvious service establishments such as restaurants, gas stations, hotels and retail establishments, other options have been planned and additional options should be considered. Service businesses produce both indirect and induced ripple effects which increase supplier sales and the amount of a worker's income spent in the economy. For example, Mingo County's decision to create an air transportation park close to the I-73/74 can provide much needed jobs and an economic boost to the area. As plans for the extension of the Hatfield-McCoy Trail System continues available land adjacent to the corridor and the corridor as a whole should be explored. The trails have facilitated the addition of new lodging, ATV dealerships and restaurants.

Other land options exist that have not been fully explored by any counties along the route of the I-73/74 Corridor. A distribution center along the roadway would provide tremendous economic benefits to West Virginia, as an average distribution center would employ 200 workers directly generate approximately $18 million in economic output in 2020. The tourism industry of the state could be boosted by a commitment to agri-tourism projects. I-73/74 will provide a direct route to many West Virginia locations and the tourism industry could benefit immensely. The fish hatchery in Mingo shows that aquaculture is a feasible way to increase jobs and the economic base while providing a high demand product in the Unites States and worldwide. Attractive incentives and quality available land could bring the car manufacturing industry to West Virginia. Inexpensive, shovel ready sites with access to utilities is required by the car industry and the land surrounding the roadway could meet these requirements provided utility corridors are constructed. One of the more attractive potential uses for land adjacent to I-73/74 is a project similar to the Charles Pointe master-planned community. This "all in one" location provides commercial, residential and retail options to Bridgeport, WV and surrounding areas. It is of the utmost importance that the land surrounding the roadway be used to its maximum potential as it will ultimately provide jobs and significant positive economic impacts.

CHAPTER 5. ECONOMIC IMPACT OF THE I-73/74 NHS CORRIDOR

This chapter reviews relevant economic studies and builds a regional economic impact model to quantify the economic impacts of the I-73/74 NHS Corridor in West Virginia. The chapter begins with a review of economic feasibility studies associated with highway development. A previous economic impact study on I-73 corridor in West Virginia (Chmura Economics & Analytics, 2009) is highlighted in the literature review. A social and economic overview of the study region then follows. The chapter will then present a brief review of the Regional Economic Model Inc. (REMI), model assumption and empirical results of the REMI model. In this report, a single-region model including Wayne, Mingo, Mercer, McDowell and Wyoming counties is developed. Construction cost and time savings by P3s, traffic and safety impacts and effects on the service industry along I-73/74 NHS Corridor (i.e., hotel, gas station, and restaurant businesses) are considered. The model results show dynamic impacts on total employment, personal income and Gross Regional Product in the study region. Short- and long-run economic effects from the I-73/74 NHS Corridor project are discussed.

Literature Review on Highway Development

As discussed in the Wilbur Smith study (1998), created by the Appalachian Regional Commission, the Appalachian Development Highway System (ADHS) is a 3,440 mile network of highways developed to promote economic development in the Appalachian region. Wilbur Smith Associates (1998) conducted a study focusing on 12 of the 26 corridors to determine the extent of the impacts incurred on the economy. The REMI model was used to comprehensively evaluate the corridors studied, spread out among 10 states. These corridors were evaluated on travel efficiency and regional economic development. Table 5-1 depicts the results of the evaluations from an economic efficiency standpoint.

Table 5-1 Economic Evaluation Results

Perspective	Net Present Value	Internal Rate of Return	Benefit or Impact/Cost Ratio
Economic Efficiency	$755,743,000	7.87%	1.18
Regional Economic Development	$1,344,376,000	8.29%	1.32

Source: Wilbur Smith Associates, 1998

For the time frame of their study, the net present value was found to be $755 million and 1.18 of BCR is reported for the economic efficiency. From an economic development standpoint, the net present value totals $1.344 billion over the study time frame. The results are shown in Table 5-2 for three selected years.

Table 5-2 Economic Development Impacts

Increases Due to ADHS	1975	1995	2015
Jobs	6,100	16,270	42,190
Population	14,690	30,420	84,480
Wages ($ million)	$68	$426	$1,178
Value Added ($ million)	$271	$1,002	$2,975

Source: Wilbur Smith Associates, 1998

In 1995, the ADHS had added an additional 16,000 jobs with an expected 42,000 jobs created by 2015. By 2015, the net increase in value added is expected to reach $2.9 billion; in 2025, this number is anticipated to reach $6.9 billion. These numbers indicate that the ADHS corridors accomplished their goal of increasing production in the regions' economies, furthermore increasing jobs and wages (Wilbur Smith Associates, 1998). Travel efficiencies over the 1965 to 2025 time period are valued at $4.89 billion resulting from improved road conditions leading to increases in economic opportunities. With an economic rate of return at 7.87 percent, this project is seen as a solid return on investment. For each $1 earned over the 60 years span, $1.18 in efficiency benefits and $1.32 in economic impact benefits were collected. This benefit accrual was witnessed in all 12 corridors in the study, efficiency on returns ranged from 5.44 percent per year to 10.06 percent. Non-highway users also benefitted from this project through job creation and increased wages. Finally, the ADHS made Appalachia more competitive and open for economic opportunities. Over the 1965 to 2025 time period, the increase in competitiveness was valued at $2.7 billion (Wilbur Smith Associates, 1998).

In 2009, Chmura Economics and Analytics completed a study of Interstate 73/74 (I-73/74), which partly passes through West Virginia, includes the KCH. Spanning five counties in WV—Mercer, McDowell, Wyoming, Mingo and Wayne—I-73/74 is made up of the Tolsia Highway and the KCH. Highways have large impacts on a region's economic development. The main economic benefits that can be concluded from various highway studies include travel efficiency,

business attractiveness and economic benefits of firm relocations and expansions (Chmura Economics & Analytics, 2009). By adding new or additional transportation opportunities, there is a possibility for a decrease in travel time, aiding both business and leisure users. There is a tendency for businesses, mostly in the service industry, to collect around interstate interchanges. Chmura Economics & Analytics (2009) observed in numerous case studies, instances of interstates contributing to faster population and employment growth in rural counties. Despite per capita income growth paralleling the state average, previous studies have found the economy of the area surrounding the I-73 corridor has been varied and significantly lower than the state average.

According to Chmura Economics & Analytics (2009), the construction phase of I-73 will last from 2007 to 2020 with an estimated cost of $2.8 billion, $2 billion is directed towards construction spending and $0.8 billion is the subsequent ripple from the construction. On its own, construction is anticipated to give way to 1,222 new jobs per year until 2020 and an additional 449 jobs per year from the ripple effect; this totals over 1,600 jobs per year during construction. The KCH is expected to incur 58 percent of the economic impact from this construction. By saving travel time for businesses and travelers, there will be an increase in cost savings and productivity; the estimated cost savings for the I-73 region as a whole is expected to reach more than $23 million in 2020 with 57 percent of the cost savings affecting the Tolsia Highway Corridor.

Analyzing traffic projections on I-73, the distance to towns and design of interchanges, Chmura Economics & Analytics (2009) identified 34 interchanges along the highway and divided them into five categories: residential, light tourist service, economically competitive, economic integration and heavy tourist service. Light tourist areas usually have one gas station and one motel to support a modest amount of traffic. Economically competitive areas increase establishments to a minimum of two gas stations, one fast food restaurant and two hotels to support a high traffic flow near towns. Economic integration and heavy tourist interchanges have the highest number of businesses to support a heavy traffic flow near other interstates.

Table 5-3 I-73 Projected Businesses Establishments in Roadside Services

	Wayne	Mingo	Wyoming/McDowell	Mercer	I-73 Corridor
Number of Interchanges	8	9	7	10	34
Motels	183	183	69	388	822
Gas Stations	40	71	32	87	230
Fast Food Restaurants	59	39	39	118	255
Full Service Restaurants	66	-	-	131	197
Total	**347**	**293**	**139**	**724**	**1,504**

Source: Chmura Economics & Analytics, 2009

By using employment figures for businesses along I-73 in Virginia, Chmura Economics & Analytics (2009) were able to project that service businesses located at these interchanges are expected to support 1,504 jobs in 2020 (Table 5-3); almost half of these will be located in Mercer County. Service businesses along I-73 alone are estimated to provide an economic impact of $172 million in 2020 (Table 5-4), $130 million in direct spending. The overall economic impacts can reach $1.32 for every $1.00 spent by users. In addition to businesses, these newly desirable areas are predicted to attract retail distribution centers; creating over $20 million in economic impacts and over 250 jobs each.

Table 5-4 Economic Impact of Service Businesses in the I-73 Corridor (2020)

Region		Direct	Ripple	Total
Tolsia Corridor	Spending ($MM)	$42	$14	$55
	Employment Compensation ($MM)	$13	$4	$18
	Employment	486	84	570
King Coal Corridor	Spending ($MM)	$88	$29	$117
	Employment Compensation ($MM)	$28	$9	$38
	Employment	1,018	178	1,169
I-73 Corridor	Spending ($MM)	$130	$42	$172
	Employment Compensation ($MM)	$42	$14	$55
	Employment	1,504	261	1,765
Note: Figures may not sum due to rounding				

Source: Chmura Economics & Analytics, 2009

After completion, West Virginia is expected to receive over $10 million in annual tax revenue and $0.5 million in fiscal benefits for local governments. Besides monetary benefits, industries and residents will benefit from easier access to markets, the region will be a more desirable location for businesses and communities to expand and accidents are expected to decrease with the increased safety of the new roads (Chmura Economics & Analytics, 2009). A summary of benefits can be found in Table 5-5.

Table 5-5 I-73 Economic Impact Summary

	Total Economic Impact ($MM)	Total Employment Compensation ($MM)	Total Job Creation	State Tax Revenue ($MM)	Local Tax Revenues ($MM)
Average Annual One-time Construction Impact (2007 – 2020)					
Tolsia Corridor	$83.7	$33.8	690	$1.2	$0.7
King Coal Corridor	$117.9	$47.6	972	$1.7	$0.7
I-73 Corridor	**$201.6**	**$81.4**	**1,661**	**$2.9**	**$1.5**
On-going Impact (2020) – Tolsia Corridor					
Cost Saving	$13.4				
(Productivity)	$55.1	$17.6	570	$3.6	$0.8
Roadside Services	$24.3	$13.3	254	$0.6	$0.1
Distribution Canter	**$92.8**	**$30.9**	**824**	**$4.2**	
Total Tolsia Corridor					**$0.9**
On-going Impact (2020) – King Coal Corridor					
Cost Saving	$10.2				
(Productivity)	$117.3	$37.7	1,196	$7.7	$3.1
Roadside Services	$24.3	$13.3	254	$0.6	$0.1
Distribution Canter	**$151.9**	**$51.0**	**1,450**	**$8.4**	**$3.1**
Total King Coal Corridor					
On-going Impact (2020) – I-73 Corridor					
Cost Saving	$23.6				
(Productivity)	$172.4	$55.3	1,765	$11.3	$3.8
Roadside Services	$24.3	$13.3	254	$0.6	$0.1
Distribution Canter	**$220.3**	**$68.6**	**2,020**	**$12.0**	**$0.4**
Total I-73 Corridor					

Source: Chmura Economics & Analytics, 2009

By employing a WVDOT travel demand model, projected forecasts were calculated for daily traffic in 2020. Estimates expect a range of 24,500 at a busy section of the Tolsia Highway to 12,220 vehicles on the more rural segment of the KCH (Chmura Economics & Analytics, 2009). The improved efficiency resulting from the KCH will also reduce travel time and costs. Using the traditional method of simulation, cost savings estimated on the amount of traffic and total time saved traveling on I-73 can reduce travel time from Huntington to Bluefield by 39 percent, from 228 minutes to 138 minutes; travel time on the KCH alone can be reduced by as much as 44 percent. By using secondary research to convert time savings into dollar amounts, Chmura Economics & Analytics (2009) found an annual time savings of 2.8 cents for every dollar of investment based on the figures for West Virginia. Compared to other sectors of I-73, particularly those in Virginia, cost savings are smaller. This is understood to be caused by a smaller amount of traffic using the highway.

There are risks associated with this type of long-term forecasting based on assumptions for the future. There are potentially upside and downside effects that could come about from unforeseen events (Chmura Economics & Analytics, 2009). In order for businesses that move into the area to operate, requirements that may need additional funding need to be met; the main necessities are extending water and sewer services to rural areas. In additon to the costs of construction, another factor is the volatile price of oil, high fuel prices can deter auto travel contributing to a slow economic impact. The current analysis assumes that no recession will occur after 2020, leading to the belief that companies will be able to maintain their 2020 levels of output for the following years. Also, these projections are based on the assumption that there will not be a toll plaza located on I-73. The inclusion of a toll road has potential to slow economic expansion. On the upside, with the projected expansion and relocation of businesses outside of the service industry, it is possible to achieve a higher economic impact than presented. The proximity to the east coast and midwest allows a firm the potential to expand their business into new markets or increase activity in industries currently located in the area, such as the mining industry. The Chmura Economics & Analytics (2009) report does not include projects that are already moving forward in planning or construction that could add to the economy. These additional projects could mean that the traffic flows for I-73 have been undreestimated.

Kent and Sowards (2006) present the activity surrounding the Coalfields Expressway through Virginia and West Virginia. This highway is designated to be four lanes of restricted-access controlled, divided lane highway from Beckley, West Virginia to Pound in Wise County, Virginia. This highway is expected to pass through rugged terrain, consisting of steep grades and hazardous curves in areas frequently used by coal trucks. Upon completion, the KCH will connect with the Coalfields Expressway near Welch, WV to provide easier access from Columbus, Ohio to cities in Virginia. Projected positive long-term benefits include an increase in employment, traffic volumes, personal income—particularly wages and salaries—number of business establishments, increased population and school enrollments. Studies of other areas with similar transportation projects indicate that potential benefits may not be recognizable until a decade, or longer, has passed. Additionally, there are negative impacts that are possible, but these are generally not included in economic studies due to difficulties in assigning quantities to the effect. A quasi-experimental analysis was used to compare regions and illustrate their differences. Results reveal that areas containing four-lane, divided, limited control access highways reach higher rates of growth than those in the counties comprising the Coalfields Expressway. Despite this finding, the Coalfields Expressway would allow an increase in economic growth for the regions and increased access to areas that are quickly growing (Kent and Sowards, 2006).

According to the WVDOT study (2000), Corridor H is expected to increase the quality of jobs available to the area, support safer travel and decrease travel time in West Virginia. Spanning from I-79 in Weston, WV to northern, VA Corridor H is a part of 26 highway corridors proposed in the 1960s to promote economic development in the Appalachian region—from New York to

Mississippi. Of the sections in West Virginia, corridor H is the last to be completed; 40 miles from Weston to Elkins is complete but the 100 mile portion from Elkins to the state of Virginia is unfinished. Over the years, support from residents to finish the section has dwindled, from 77 percent in 1998 to 71 percent strongly favoring construction, 10 percent somewhat favoring construction, six percent opposing and five percent somewhat opposing the completion of the project. Statewide, 65 percent of residents favor the completion of construction. In addition to the main proponent of the highway, safety, the project is estimated to boost economic development in the area by connecting east central West Virginia to Washington, DC, Baltimore, Philadelphia, New York and points north and south on Interstate 81 (WVDOT, 2000). In 1996, $78 million in direct tourist costs and $37.5 million in indirect sales—$115.5 million in total economic contribution—were generated in the Potomac Highlands region alone. The WVDOT (2000) states that the third leading cause of deaths in West Virginia is motor vehicle accidents; 8,782 vehicle accidents occurred in 1996, accounting for 11.4 percent of all deaths that year. By improving the highways, annual accident cost savings are to increase from $47 million in 1995 to $80 million in 2024, total savings of $2.5 billion over the 59 year span of 1965 to 2024. A 1999 study estimated that 710,000 person trips were made to the region for an average stay of 3.7 days and $67 in expenses per person per day. Safer travel and decreased travel time within the state is anticipated to give way to an increase in tourism for the state. Previously completed corridors in the state, such as Corridor G, have shown exponential growth. In 1975, 3,600 new full-time equivalent jobs and a value added impact of over $100 million were estimated to result from this corridor highway construction. By 2015, 42,000 are expected to be added to the region and the net increase in annual value added will be over $2 million.

A 2002 Cambridge Systematics, Inc. study presents the main means in which transportation investment can economically benefit a region: boosts industry competitiveness; develops household welfare; strengthens local, regional and state economies; increases business and leisure travel; reduces economic losses associated with accidents; lowers economic losses associated with congestion; and creates jobs in the transportation sector. West Virginia is specifically discussed in boosting business and leisure travel. Completed in 1978, U.S. 19 has created a tourism boom. The daily traffic counts on the highway, from Sutton to Beckley, increased fourfold in its first 16 years of existence—from 2,800 vehicles to over 10,000 (Cambridge Systematics, Inc., 2002). With traffic volumes exceeding predictions, the road was widened to four lanes in sections that were originally two lanes. To further accommodate the increase in traffic volumes and tourism opportunities available, new interchanges were also added. Tourists come from different regions of the country to take advantage of the tourism opportunities available in this area. Once the world's longest single arch steel bridge, the New River Gorge Bridge is still a tourist stop along U.S. 19, even attracting tourists before its completion. Recreational activities, such as whitewater rafting, are in high demand by tourists to the area; approximately 250,000 people raft the New River, the Gauley River and the three other main rivers in West Virginia each year. High demand also leads rafting businesses to generate over $70 million per year.

In addition REMI (2004) estimated the full economic impacts that could occur, from construction spending and improved travel efficiency from a proposed upgrade to sections of US Highway 54 in New Mexico. The results indicated a potential gross regional product (GRP) of $340 million and 1,400 jobs added to the state's economy in the construction phase. In the long-run, the enhanced efficiency of the highway is expected to reduce production costs of existing industries, leading to an additional GRP of over $24 million. Indirect effects from the highway upgrades are expected to create over 500 new jobs by 2023. After construction, improvements made on US 54 are expected to lead to the indirect benefit of an increase in Total Output for each year after construction. From the project's completion in 2009 until 2023, benefits should total over $600 million with each of the five counties affected receiving $2.26 of benefit from each dollar invested in construction and maintenance of US 54 (REMI, 2004). In addition, the developed access to transportation along the corridor has the potential to attract businesses to the area.

Economic Background of the Region

Upon completion, the I-73/74 NHS Corridor will pass through McDowell, Mercer, Mingo, Wayne and Wyoming (Figure 5-1) counties, providing traffic and travel relief to residents of West Virginia and other interstate travelers. Although within a close proximity to the corridor, Raleigh and Logan counties have been excluded in the economic background analysis as the I-73/74 does not pass directly through them.

Figure 5-1 I-73/74 NHS Corridor Map

Mingo County

Mingo County boasts the title of West Virginia's youngest county as it was formed by the state legislature in 1895 after a legal protest by a moon-shiner claimed that the Logan County Court did not have jurisdiction over the guilty verdict of his case. Population has decreased 5 percent from 2000 to 2010 and persons 65 years and over made up 13.5 percent of the population. In 2010 26.9 percent of the population lived below the poverty level and per capita income stood at $17,323 (United States Census Bureau, 2011b). In 2010, Mingo County employed 1,239 miners and underground mining accounted for 7,783,806 tons while surface mining totaled 3,938,494 tons for a total of 11,722,300 tons of coal mined (WVOMHST, 2011).

Mercer County

Mercer County, the southernmost county in West Virginia was formed on March 17, 1837 and provides opportunities in industries such as coal, lumber manufacturing and agricultural products—such as dairy, livestock and poultry. Population decreased only 1.1 percent between the years 2000 and 2010 with 18 percent of the population over the age of 65. Per capita income between 2005 and 2009 was $17,943 and 21.3 percent of the population lives below the poverty level (United States Census Bureau, 2011b). Mining does not play a large role in the Mercer County economy as 2010 mining employment consisted of 15 individuals and a total of 71,058 tons mined, all from underground mining (WVOMHST, 2011).

McDowell County

Located in a flood prone area of Southern West Virginia, McDowell County was formed on February 20, 1858 and was nationally known for its prominence in the coal mining industry during the 1950s. A decrease in in mining jobs directly affected the poverty rate as 40.8 percent of the population lived below the poverty level in 2010. McDowell County population has decreased 19.1 percent from 2000 to 2010 with 16.5 percent of the population aged 65 years or older and a $12,585 per capita income from 2005 to 2009 (United States Census Bureau, 2011b). McDowell County continues to struggle economically due to the current lack of jobs, available land for improvements and the ever increasing poverty rate (WVOCCD, 2009). Despite the decrease in mining jobs, both underground and surface mining make up a large part of McDowell's employment. In 2010 mining employment accounted for 1,156 jobs and a total of 5,121,324 (2,458,651 underground and 2,662,673 surface) tons of coal mined (WVOMHST, 2011).

Wayne County

As a result of the formation of West Virginia on June 20, 1863, Wayne County, Virginia became known as Wayne County, West Virginia. The leading industries and chief agricultural products of Wayne County include coal, natural gas, lumber, cement, hay/grain, tobacco, livestock, dairy, poultry, fruit, vegetables and sorghum. 2010 coal production totaled 4,470,482 tons of coal and employed 593 individuals. Underground mining accounted for 877,244 tons, while surface mining was responsible for 3,863,238 tons (WVOMHST, 2011). Population has decreased a meager 1 percent from 2000 to 2010; however 16.5 percent of the population consists of residents over the age of 65. Per capita income stands at $18,893 and 20.8 percent of the Wayne County population is living below the poverty level (United States Census Bureau, 2011b).

Wyoming County

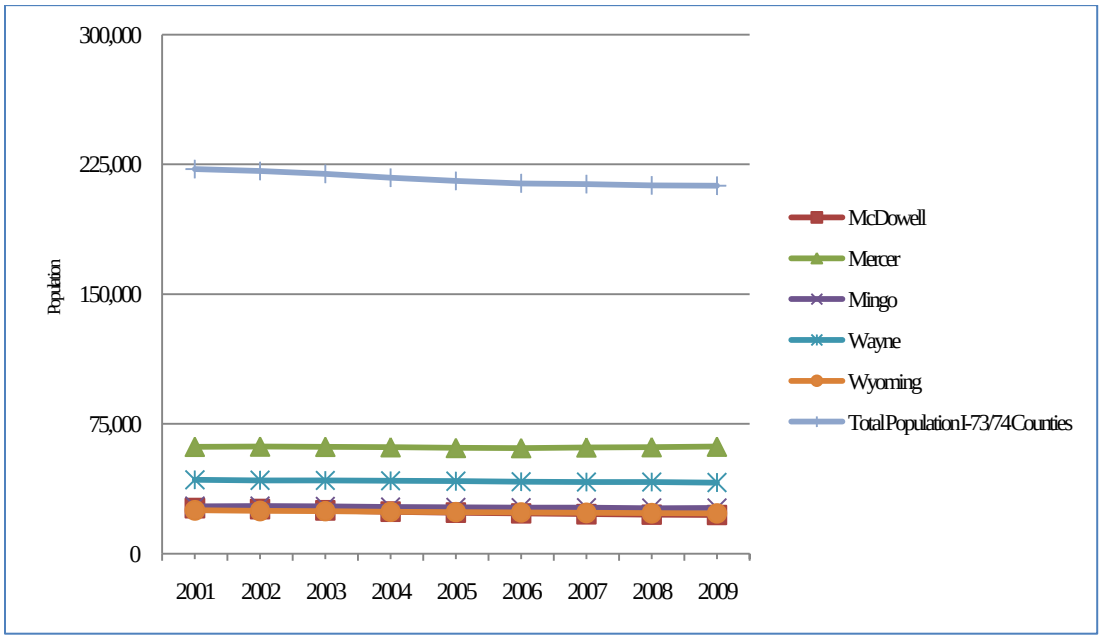
Wyoming County was created by the Virginia General Assembly on January 26, 1850 from the upper portion of Logan County. Boasting a low cost of doing business and low cost of living, Wyoming County is an attractive area of West Virginia (WCEDA, 2010). However, Wyoming County tends to have problems with flooding similar to McDowell County and as of 2010 total population in Wyoming County has decreased 7.4 percent from 2000 and individuals aged 65 and older make up 15.1 percent of the total population. The 2005 to 2009 per capita income was

$16,693 and 23.5 percent of the population is living under the poverty level (United States Census Bureau, 2011b). Underground and surface mining makes up a large portion of the employment in Wyoming County as 1,930,517 (underground) and 2,516,909 (surface) tons were mined, accounting for a total of 4,447,426 tons and 1,200 jobs (WVOMHST, 2011).

Population in the Study Region

In 2001, after decreasing each year, the population (Figure 5-2) of the I-73/74 corridor totaled 222,255 and according to the 2009 Census Report, the population now stands at 212,636. McDowell County was the hardest hit by population decrease and lost approximately 4,000 residents between 2001 and 2009. While the population has not substantially increased in any of the counties, Mercer has been consistent while either losing the fewest number of residents or posting a modest increase during the years sampled. The declining population is representative of a deteriorating economy along the I-73/74 route considering the total population of West Virginia increased during the same period. Overall, the population increased 1.18 percent from 2001 to 2009; however, each county sampled posted a decrease in population with the exception of Mercer County which increased a meager 0.12 percent. McDowell experienced the greatest population decline and lost approximately 15 percent of its residents. The lack of available jobs and an aging population could have contributed to the difficulties in retaining or attracting residents to these counties.

Figure 5-2 Population of the Study Region

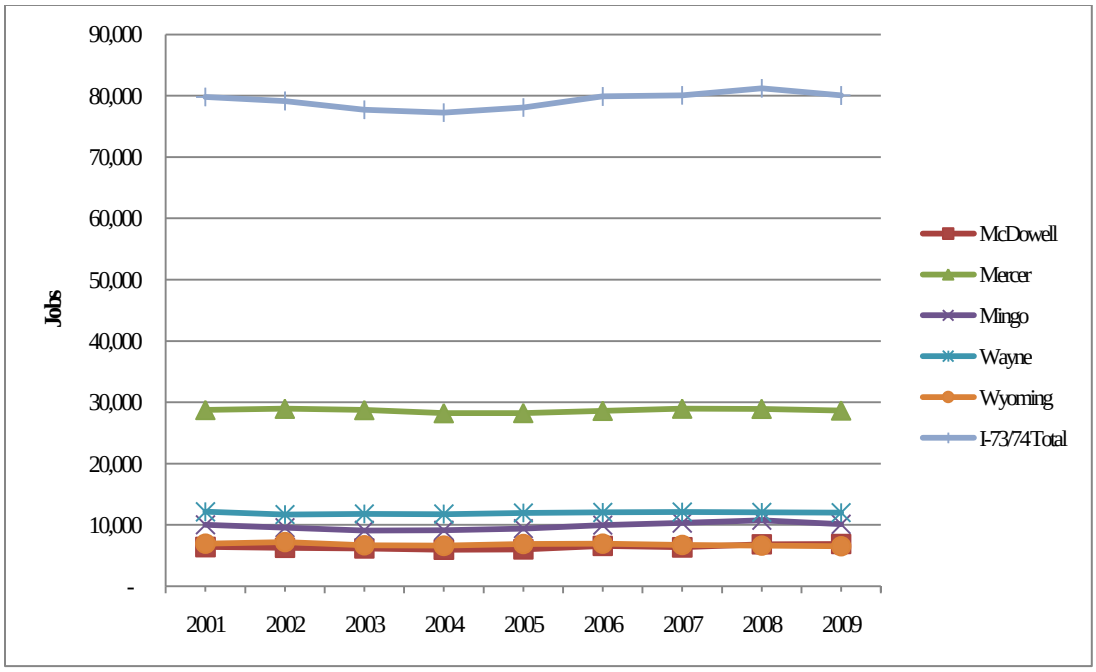


Source: United States Bureau of Economic Analysis, 2011

Total Employment

In 2009, total employment (Figure 5-3) in the study region was 80,043, or 8.89 percent of the state total. There is a small increase from 2001 when 79,821 jobs (8.87 percent of the state total) were located in these counties. Throughout the nine year sample period, employment in these areas remained consistent with neither a large increase nor decrease in any given year. However, the state as a whole experienced several large increases; particularly from 2003 to 2008, where total state employment increased from 870,921 to 924,591. These increases show that while new jobs are being created in the state, the I-73/74 Corridor region is not benefiting from them. During the 2001 to 2009 period, total employment in the state and the I-73/74 Corridor region increased 3.75 percent and 0.28 percent respectively.

Figure 5-3 Total Employment in the Study Region

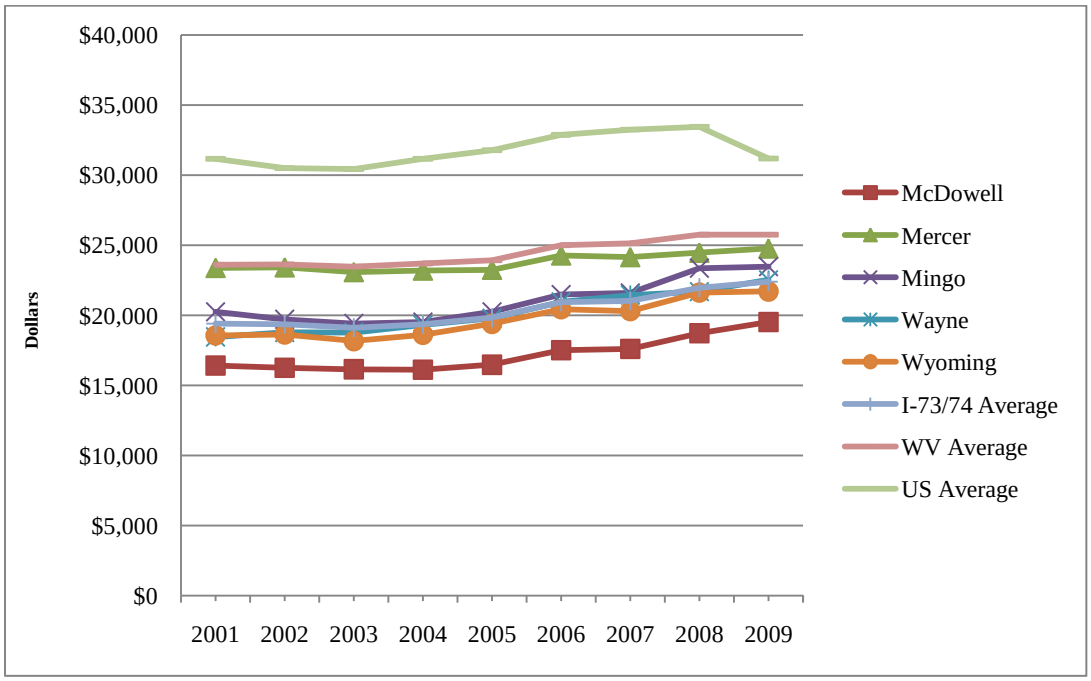


Source: United States Bureau of Economic Analysis, 2011

Per Capital Personal Income

Obtained from the Bureau of Economic Analysis, per capital personal income or the total personal income divided by total midyear population is presented in 2001 dollars (Figure 5-4), using the Employment Cost Index to adjust for inflation. Per capita personal income along the I-73/74 corridor remains lower than the West Virginia average. Mercer County has a per capita personal income relatively close to the state average and ranks as the top county on the corridor. Between 2001 and 2009, per capita personal income increased 9.09 percent in West Virginia and 16.29 percent along the I-73/74 corridor. Despite these increases, our study region continues to remain below both the West Virginia and United States average.

Figure 5-4 Per Capita Personal Income in the Study Region (in 2001 Dollars)

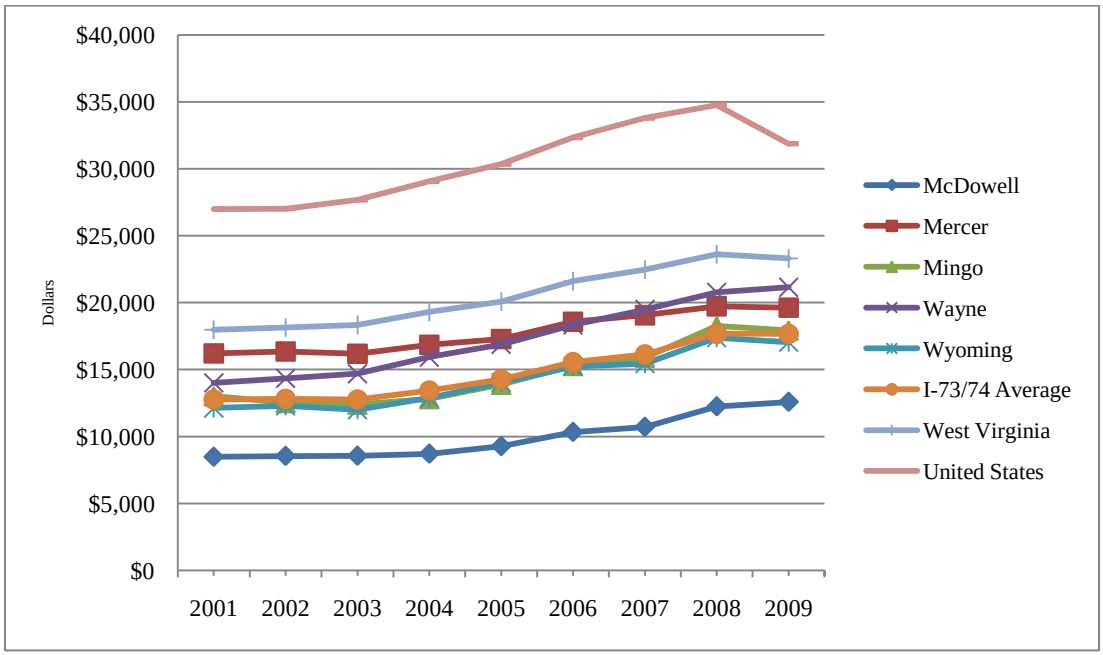


Source: United States Bureau of Economic Analysis, 2011

Net Earned Income

Net earned income (Figure 5-5) was calculated by obtaining personal income, transfer receipts and the population of each of the counties in the study region. Personal current transfer receipts are benefits received for which no current services are performed. These include payments by governments and businesses to individuals and nonprofit institutions serving individuals (BEA, 2011). These payments include but are not limited to retirement and disability insurance benefits, workers compensation, Medicare benefits, family assistance, food stamps, unemployment and veterans benefits. All counties along the route of I-73/74 perform well under the West Virginia average as well as national net earned income. However both Mercer and Wayne have higher net earned income than the other counties and are relatively close to the state average. Overall, West Virginia's net earned income is substantially lower than the United States for all years sampled.

Figure 5-5 Net Earned Income



Source: United States Bureau of Economic Analysis, 2011

Industry Mix

As shown in Table 5-6, mining makes up the largest industry sector as measured by employment in Mingo and Wyoming. McDowell County would follow suit by citing mining as the top industry and although it is included in the state totals as provided by the BEA, county level mining data was not made available from 2005 to present. The counties with very few mining jobs have a greater percentage of jobs in sectors such as services, trade or government. A large share of government jobs is fund in McDowell, Mercer, Wayne and Wyoming Counties. Approximately 59 percent of all jobs in Mercer County are government or service related. In most of the counties within the I-73/74 corridor, government jobs are increasing. It is shown that, overall, the services sector provides the greatest number of jobs to all West Virginia residents, making up approximately 33 percent in 2001, 34 percent in 2005 and 35 percent in 2009. The I-73/74 project is expected to create a positive impact in the service industry.

Table 5-6 I-73/74 Sector Employment as a Percentage of Total Employment

	Farming & Mining	Construction	Manufacturing	Transportation, Warehousing & Utilities	Trade	Financial, Insurance & Real Estate	Services	Gov.
McDowell								
2001	15.09%	3.49%	1.50%	6.29%	15.85%	9.16%	15.90%	36.58%
2005	*	3.40%	1.52%	7.11%	17.74%	11.62%	20.97%	41.87%
2009	*	8.34%	1.36%	*	17.46%	11.34%	15.65%	43.67%
Mercer								
2001	2.60%	7.70%	7.90%	4.76%	23.82%	6.53%	23.69%	23.01%
2005	2.05%	5.93%	5.88%	4.00%	18.90%	5.86%	38.08%	19.31%
2009	3.32%	5.23%	5.16%	3.99%	17.50%	5.60%	38.84%	20.36%
Mingo								
2001	28.75%	4.51%	4.70%	15.70%	11.64%	3.61%	11.89%	19.20%
2005	22.90%	4.95%	4.47%	11.71%	10.76%	3.51%	24.88%	16.82%
2009	27.99%	8.95%	4.10%	*	7.34%	3.70%	20.92%	17.25%
Wayne								
2001	8.22%	9.34%	10.23%	*	15.48%	3.19%	9.92%	33.74%
2005	9.11%	8.02%	8.12%	*	13.96%	3.84%	10.95%	34.93%
2009	12.77%	6.41%	6.06%	*	11.93%	3.77%	13.40%	36.63%
Wyoming								
2001	21.05%	8.08%	3.02%	8.42%	18.88%	3.76%	11.99%	24.81%
2005	23.75%	7.26%	3.71%	7.06%	18.10%	3.82%	11.39%	24.92%
2009	22.81%	5.48%	2.54%	7.43%	18.81%	4.81%	11.38%	26.74%
WV State Total								
2001	6.39%	6.30%	9.23%	4.06%	16.92%	5.83%	32.84%	18.44%
2005	6.29%	6.61%	7.80%	3.96%	16.66%	6.00%	34.26%	18.41%
2009	7.94%	5.96%	6.29%	3.72%	15.59%	6.27%	35.35%	18.87%

*Data Not Disclosed

Source: United States Bureau of Economic Analysis, 2011

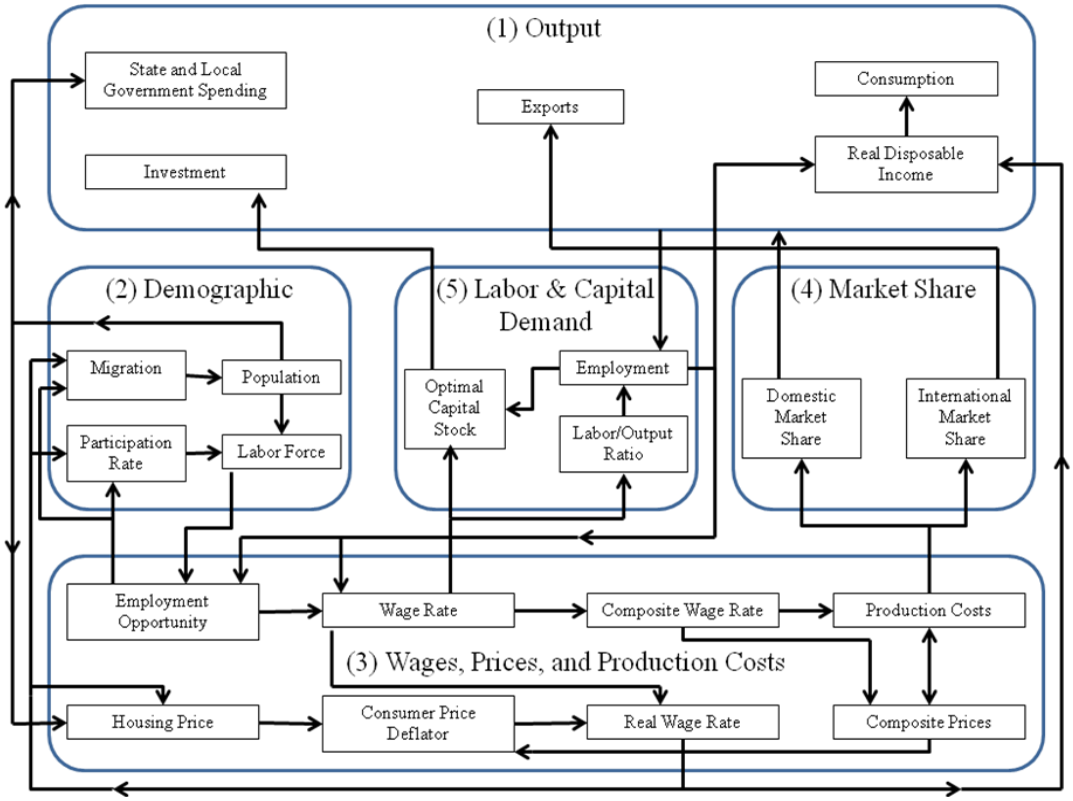
Regional Economic Impact Model of I-73/74 NHS Corridor

Regional Economic Impact Model (REMI)

A widely used tool for regional impact analyses, REMI can analyze complex scenarios that are beyond the capacity of a normal input-output analysis. REMI employs several programs—such as the U.S. Bureau of Economic Analysis, the U.S. Bureau of Labor Statistics, the U.S. Department of Energy, and the U.S. Census Bureau—to build customized models that capture cause-and-effect relationships by implanting an economic structure into their models (Center for Transportation Research, 2011). REMI provides year-by-year forecasts for adjustments that take place in the economy; it is especially sensitive to a wide range of policies, project alternatives and the relationships between national and regional economies. The assumptions that households maximize utility and producers maximize profits drive the economic theory from which this model is developed. According to Crihfield and Campbell (1991), the REMI model encompasses a sector input-output and an econometric forecasting model for regions defined in a project.

Founded in the 1980s with the purpose of improving the quality of decisions made about public policy, Regional Economic Models, Inc. (REMI) developed new regional forecasting and policy analysis models (REMI, 2011a). After years of research, the original REMI model expanded to produce a more inclusive representation of the regional economy. This model—sometimes referred to as an econometric model, an input-output model or a computable general equilibrium model—is an actively changing forecast and policy analysis tool. By integrating multiple forecasting models, the REMI model is very dynamic and able to produce year-by-year estimates of the total regional effects of a specific policy proposal. While incorporating inter-industry and cause-and-effect relationships, REMI models express and accommodate economic changes that occur over time. This allows for changes in behavior due to various economic conditions, somewhat based on the general equilibrium economic theory (REMI, 2011a). As shown in Figure 5-6, there are five blocks that make up REMI relationships: output; demographic; wages, prices and production costs; market share; and labor and capital demand. Each block contains economic elements that analyze employment, prices, income, revenues and other economic variables. In addition, REMI can forecast for one or multiple regions that will be affected by a project. Over the years, REMI has become increasingly popular among regional planners as a tool to analyze economies.

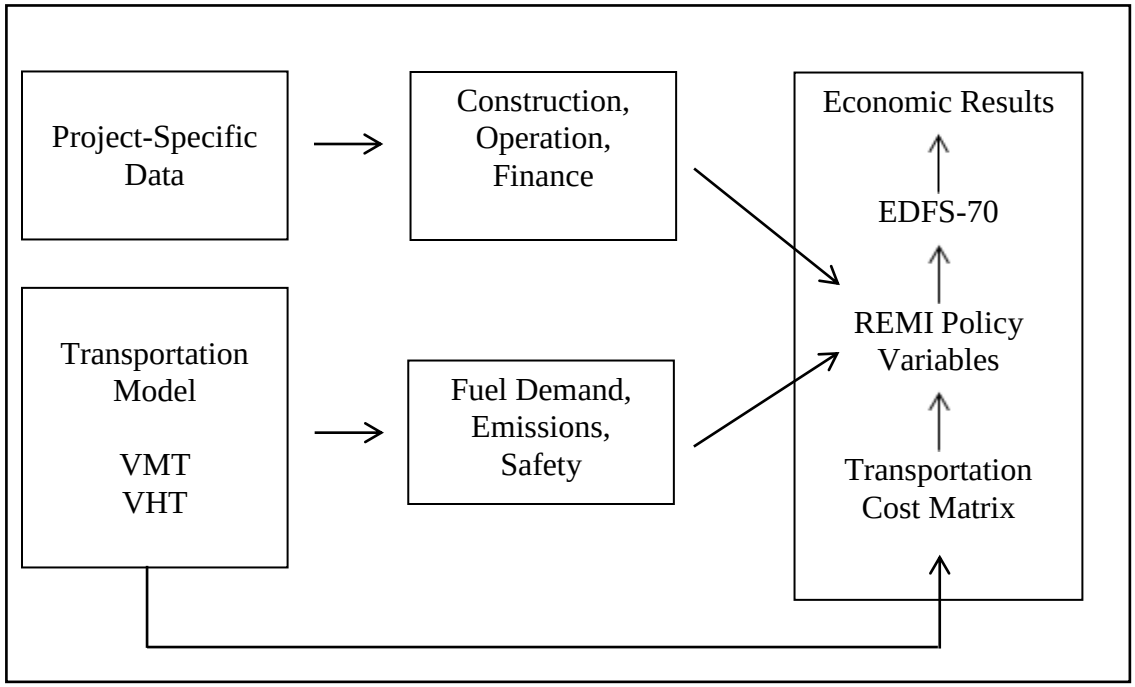
Figure 5-6 REMI Model Blocks and Linkages



Source: REMI, 2008

TranSight (Figure 5-7) predicts the overall economic and demographic effects associated with a transportation project or improvement (REMI, 2011c). In order to effectively use TranSight, users must provide project-specific information—specifically estimates from travel demand models, construction expenditures and funding source information. Other economic and demographic data are built into the model by the distinct region in which the project is located. In the end, TranSight has the ability to provide the overall effects for employment, personal income, transfer payments, taxes, price index, real disposable income, out, gross regional product, population and labor force (REMI, 2011c). The findings from using the model allow users to rank important projects, inform the public and decision-makers on the project's progress and show how jobs and the income of area residents depend on transportation. Thought an input-output model can be used as an alternative, TranSight goes a step further and shows the total effects of transportation projects, including various effects over time. By utilizing their experience in regional policy analysis and planning, REMI and TranSight customizes data for the specific regions (REMI, 2011b). The main advantage of using TranSight includes incorporating general equilibrium theory, econometrics, input-output analysis and the new economic geography in a consistent system.

Figure 5-7 TranSight Structure



Source: REMI, 2011b

Construction Cost & Time Savings Provided by P3s

Design-bid-build has previously been the preferred method of contracting and construction for the highway industry. However, this method is limited and can be slow as it does not favor a life cycle cost approach to projects. Innovative contracting methods, such as P3s, offer the incentive of reducing construction time while keeping costs at a minimum. Unanticipated events and situations can cause cost and time overruns which are often unavoidable. However, P3s can assist in avoiding many design plan or project management problems because they can provide foresight into the future of a project (Batelle, 2003).

P3s offer time and cost savings when it comes to building highway infrastructure. The volume of traffic on roadways has been increasing over the past 20 years and the need to accelerate construction is becoming an important issue, particularly in areas of high traffic concentration (Batelle, 2003). In a USDOT report to congress in 2004, examples of both cost and time savings for various projects are discussed. The FHWA defines cost-savings as the difference between an engineer's estimate and the actual cost of an individual project (USDOT, 2004). It has been estimated that the use of performance-based contracting, a form of P3s can result in cost savings ranging from 6 to 40 percent (Batelle, 2003).

A 2004 report issued to Congress (USDOT, 2004) offered many examples of performance-based contracting and a summary is shown in Table 5-7. The Pocahontas Parkway project, which was the first project constructed under Virginia's Public-Private Transportation Act of 1995, allowed the use of innovative design-build-finance contracting. The total cost of the project came in $10

million below the original $324 million estimated cost. The use of a P3 enabled the Pocahontas Parkway to be built 15 years earlier than it would have been if it were financed by State funds exclusively. Virginia also took advantage of innovative financing to save $47 million while cutting down the estimated seven year construction period to 3.5 years during the construction of the western loop of Route 288, which wraps around the capital city of Richmond.

A design-build-finance project for completion of Segments II, III and IV of The Denver E-470 Toll Road provided significant cost savings. The process of reducing project and capital costs by implementing interim and long-term financing enhancements accelerated project delivery while risk sharing allowed for construction at a cost of $408 million and five weeks ahead of schedule. It is important to note that under a traditional design-bid-build approach the project would have cost $597 million.

P3s not only allow deliver results significantly under cost estimates but by providing access to alternative financing sources, a P3 can facilitate construction that might have been delayed or not built at all, offering as much as a 50 percent time reduction in project duration. Using the design-build model, New Mexico State Route 44 was completed by issuing GARVEE bonds backed by future Federal-aid payments and cut the total project time from 27 years to three years.

Washington State's first design-build project, the SR 500 Thurston Way Interchange saved at least five months (16 percent) than using a design-bid-build process. In 1999, Route 3 North n Massachusetts was authorized as a design-build-operate P3. The first of its kind in the state, Route 3 North was completed in 42 months well below the initial estimate of 9 years.

Although no specific projects and contracts are cited, the Florida DOT found that traditional low-bid contracts had 12.4 percent cost overruns while nontraditional contracts, on average, had only a 3.6 percent cost overrun (USDOT, 2004).

Table 5-7 Examples of Innovative Contracting Approach and Savings Provided

Project	Contracting Type	Contract Award (millions)	Planned or Traditional Schedule	Actual Schedule	Time Reduction	Finished Ahead of Construction Schedule	Cost Savings
Virginia 288	Design-Build-Warrant	$236	6 years	3 years	3 years	N/A	$47 million
New Mexico Route 44	Design-Bid-Build-CM-Maintain	$314	27 years	3 years	24 years	N/A	$89 million over life cycle ($9 million during construction)
San Joaquin Hills Transportation Corridor	Design-Build	$790	Data Not Available	5 years	Data Not Available	3.5 months	On budget
Dulles Greenway Toll Road	Build-Operate-Transfer	$145	Data Not Available	2 years	Data Not Available	6 months	Data Not Available
I-15 Corridor	Design-Build	$1,376	Data Not Available	4 years	Data Not Available	5 months	On Budget
SR-91 Express Lanes	Design-Build	$60.4	Data Not Available	2 years, 5 months	Data Not Available	10 months	Data Not Available
Southern Connector Toll Road	Design-Build-Finance-Operate	$191	Data Not Available	3 years	Data Not Available	9 months	Data Not Available
Conway Bypass	Design-Build	$386.3	Data Not Available	6 years, 1 month	Data Not Available	7 months	Data Not Available
Eastern Toll Road	Design-Build	$780	Data Not Available	3 years, 8 months	Data Not Available	10 months	Data Not Available
O'Fallon Missouri (street construction)	Finance-Design-Build-Warrant	$9.5	5 years	2 years	3 years	N/A	$1.5 million
Aspen, CO (pavement rehabilitation)	Design-Build-Warrant	$2.7	5 years	1 year	4 years	N/A	$625,000
Virginia Pocahontas Parkway	Design-Build-Finance	Estimated $324	Data Not Available	Data Not Available	Data Not Available	N/A	$10 million below estimation
Colorado-Denver E-470 Toll Road	Design-Build-Finance	Data Not Available	Data Not Available	Data Not Available	3.5 years	N/A	Savings of $189 million

Sources: United States Department of Transportation, 2004

Cost-Plus-Time (A+B bidding) is a contracting method that not only considers the initial construction cost in the bidding process but also takes into the account the time needed to complete the project. Using this method shifts the risk of project delays to the public sector to the private contractor which boasts a significant reduction in project completion time due to the incentives available for early completion. The A+B contracting method is used by the FHWA Federal Lands Division and a summary of cost and time savings is presented in Table 5-8 shown below.

Table 5-8 Eastern Federal Lands Highway Division Projects Constructed using A+B Bidding

Project	Contract or Time Bid	Engineer Time Estimate	Actual Time	Time Savings	Contractor Bid Amount	Engineer Estimate Amount	Final Contract Amount	Tangible Savings
George Washington Memorial Parkway	500 days	680 days	436 days	244 days (36%)	$6,045,439.44	$6,292,480	$5,844,806.37	$447,674 (7%)
MacArthur Boulevard Washington, DC	330 days	760 days	301 days	459 days (60%)	$7,859,246.46	$8,000,000	$6,868,965.95	$1,131,034 (14%)
Delaware Water Gap Project	420 days	665 days	401 days	264 days (40%)	$5,023,827.90	$5,620,000	$4,864,378.87	$755,622 (13 %)

Source: United States Department of Transportation, 2004

I-73/74 NHS Corridor Cost Savings and Benefits to the Mining Companies

The mountainous terrain of West Virginia makes highway construction difficult and according to the WVDOT it will cost approximately $27 million to construct one mile of the KCH. Using this figure, total costs are estimated at approximately $3.9 billion and includes only the cost of constructing the actual roadbed. Utility and right of way costs are not factored into these projections.

Considering very few areas have access to public water and sewer as well as other needed utilities, estimating these costs is difficult. It will cost significantly more to establish water, sewer, and fiber optic/communication lines in areas that are not in a close proximity to already established utility lines. Sewer alone can be estimated at approximately $1 million per mile without site development by coal companies and according to a 2005 report completed by the Tennessee Department of Environment & Conservation Division of Water Supply, water line construction projects can cost anywhere from $50,000 to $150,000 per mile depending on topography, subsurface conditions, economic conditions and other factors (Tennessee Department of Environment & Conservation Division of Water Supply, 2005). Using the range provided by this report, total costs of water line construction for the KCH could range between $4,750,000 and $15,250,000.

In 2005 it was announced that the U.S. Department of Commerce Economic Development Administration (EDA) had awarded the Mingo County Commission $1.2 million to go along with the Commission's own $800,000 in order to begin the construction of the Twin Branch Motorsports Complex.[2] The $2 million was used for Phase I construction which included

[2] "Motorsports Complex Coming To Mingo County"
http://www.rahall.house.gov/index.cfm?sectionid=10&parentid=5&sectiontree=5,10&itemid=354

construction assistance for roadway, water, wastewater, storm water, sediment control, utilities, engineering and administration costs. This example alone shows that significant capital is required to equip developable land in West Virginia with the appropriate utilities.

Using data obtained from the USDOT report to Congress (2004), average cost savings on projects using innovative contracting methods were calculated. Eight of the projects discussed in the report were selected and estimated project cost was compared to the project's total cost savings to determine savings as a percentage of cost. As shown in Table 5-9, the savings ranged from 3 percent to 23 percent, with an average savings of 12 percent. Time savings for construction were also calculated in the same manner, comparing the estimated schedule with the actual schedule and calculating a time savings as a percentage. Table 5-10 summarizes the results and shows that innovative project delivery provided 36 to 89 percent time savings for these projects with an overall average of 59 percent.

Table 5-9 Innovative Project Delivery Cost Savings

Project	Estimated Cost	Cost Savings	Savings %
Pocahontas Pkwy, VA	$324,000,000	$10,000,000	3%
NM RT 44	$314,000,000	$9,000,000	3%
GW Memorial Pkwy	$6,292,480	$447,674	7%
Water Gap Project, DE	$5,620,000	$755,622	13%
MacArthur Blvd, DC	$8,000,000	$1,131,034	14%
O'Fallon, MO	$9,500,000	$1,500,000	16%
VA 288	$236,000,000	$47,000,000	20%
Aspen, CO	$2,700,000	$625,000	23%
Average Savings			12%

Source: United States Department of Transportation, 2004

Table 5-10 Innovative Project Delivery Time Savings

Project	Est. Schedule	Actual Schedule	Time Savings	Savings %
GW Memorial Pkwy	680 days	436 days	244 days	36%
Water Gap Project, DE	665 days	401 days	264 days	40%
VA 288	6 years	3 years	3 years	50%
O'Fallon, MO	5 years	2 years	3 years	60%
MacArthur Blvd, DC	760 days	301 days	459 days	60%
Aspen, CO	5 years	1 year	4 years	80%
NM RT 44	27 years	3 years	24 years	89%
Average Savings				59%

Source: United States Department of Transportation, 2004

Model Assumptions of Two Scenarios

The purpose of REMI analysis in this report is to compare the economic impacts of completion of the I-73/74 NHS Corridor without and with the use of P3s. Table 5-11 details the completion of the I-73/74 NHS Corridor with full government spending and without the use of P3s (Scenario

I). The report uses the assumption that all money required to complete the corridor would be available when needed. Even though there is no official plan or announcements to support 2012 as a beginning construction for future projects, this date was used to show the estimated construction period in the analysis. Eighty and twenty percent of total construction cost shares are used for federal and state governments.

Table 5-11 Completion of I-73/74 NHS Corridor without P3s (All Government Spending: Scenario I)

Section	Estimated Construction Costs ($27 million per mile)	Estimated Construction Time (2 years per mile[4])	Beginning year	End year of construction
KCH (TOTAL 95 miles)	$2,569,590,000			
Red Jacket (11.37 miles) [1]	$306,990,000	22.7 years	2004	2026
Buffalo Mountain (5 miles)	$135,000,000	10 years	2012	2022
WVDOT Section (5 miles)[2]	$135,000,000	10 years	2012	2022
Remaining KCH (73.8 miles)	$1,992,600,000	147.6 years	2012	2159
TOLSIA Highway (51 miles)[3]	$1,377,000,000	102 years	2012	2114
Total	**$3,946,590,000**			

[1]Two-lane facility will be open in 2012. The end year of construction will include the completion of the four-lane highways.

[2] WVDOT Section is defined as the section between Buffalo Mountain and Red Jacket.

[3] A four-lane, 57-mile road from I-64 at Kenova to U.S. 119, only six miles of the Tolsia Highway has been completed.

[4] Construction of one mile every two years on average assumes continuous ongoing construction of the entire length and sufficient funding available.

Table 5-12 shows the estimated construction cost and time savings by the use of P3s for the completion of the corridor (Scenario II). With the exception of the Red Jacket and Buffalo Mountain project, all construction cost and time savings were estimated using data and information obtained from the report to Congress (USDOT, 2004). Based on already established or announced P3s, the Red Jacket and Buffalo Mountain sections are expected to save $170 million and $110 million, respectively. This method will provide construction cost and time savings using P3s and the impacts these scenarios will have on the regional economy.

To determine the costs of the I-73/74 NHS Corridor, the road can be classified into four KCH sections: the Red Jacket, the Buffalo Mountain, the approximate 5 mile section between Red Jacket and Buffalo Mountain with construction provided by the WVDOT (WVDOT section) and the 73.8 mile section not currently under construction and with no current plans to begin construction. The entire I-73/74 NHS Corridor not only includes the KCH but the TOLSIA

Highway, as well. Although no current construction plans are underway for the remaining 73.8 miles of the KCH, cost and construction time savings were estimated. Using P3s for the entire roadway, it was found that approximately $700 million and almost 60 years could be saved. Assuming construction would begin in 2012, the roadway would be complete by 2072. Construction cost and time savings have also been estimated for the TOLSIA Highway which is reflected in our figures provided for the two scenarios. Assumptions of $5 million of paving costs are used for the scenario II.

Table 5-12 Completion of I-73/74 NHS Corridor with P3s (Scenario II)

Section	Estimated Construction Costs with P3	Estimated Construction Cost Savings (Compared to Scenario I)	Estimated Construction Time	Estimated Construction Time Savings (Compared to Scenario I)	Beginning year	End year of construction
KCH (TOTAL 95 miles)	$2,034,278,000					
Red Jacket (11.37 miles)[2]	$136,990,000	$170,000,000	16 years[3]	6.7 years	2004	2020
Buffalo Mountain (5 miles)[2]	$25,000,000	$110,000,000	6 years	4 years	2025[4]	2031
WVDOT Section (5 miles)	$118,800,000	$16,200,000	4.1 years	5.9 years	2012	2016
Remaining KCH (73.8 miles)	$1,753,488,000	$239,112,000	60.5 years	87.1 years	2012	2072
TOLSIA Highway (51 Miles)	$1,211,760,000	$165,240,000	41.8 years	60.2 years	2012	2053
Total	**$3,246,038,000**	**$700,552,000**				

[1] This study found 12% and 59% of average construction cost and time savings, respectively from the selected P3 projects (USDOT, Report to Congress on Public-Private Partnerships, December 2004).
[2] For Red Jacket and Buffalo Mountain sections, the study uses construction savings of $170 million and $110 million compared to Scenario I, respectively.
[3] Two lanes are completed from 2004 to 2012 (8 years). Eight years have been estimated for the remaining two lanes of the roadway.
[4] Mining is expected to begin in 2012 and will take approximately 12-15 years. It is assumed that roadway construction will not begin until mining is complete.

Profit Forecasts for the Mining Companies

Using ANR to facilitate the creation of the roadway provides the incentive of cost savings to the state but also offers the incentive of substantial profits to Alpha Natural Resources (ANR) and Consol Energy (CONSOL). As per Exhibit 2 of the Red Jacket Memorandum of Understanding, ANR expects to recover approximately 2,584,594 million tons of coal through their surface mining efforts while CONSOL estimated 16,784,000 tons of coal reserves. Tables 5-13 and 5-14 provide data summarizing steam coal production and profit as well as forecasted coal price and revenues. Using these figures and coal price projection data from Energy Information Administration (EIA, 2011), this report forecasts coal revenues from 2012 to 2024. The predicted profits of the ANR and CONSOL are captured to estimate an economic impact of I-73/74 Corridor using P3s (Scenario II).

Table 5-13 Steam Coal Cost of Production and Profit

Element	Unit price ($/ton)	Red Jacket section	Buffalo Mountain section
Amount Produced (Short Tons)		2,584,594 tons	16,784,000 tons
Cost			
Operating Cost	$37.68	$97,387,502	$632,421,120
Non-operating Charges	$8.03	$20,754,290	$134,775,520
Depreciation, Depletion & Amortization	$6.07	$15,688,486	$101,878,880
Total Cost	$51.78	$133,830,277	$869,075,520
Marketable Ton Reduction[2]	($8.94)	($23,100,000)	
Total Cost (after ton reduction)	**$42.84**	**$110,730,227**	
Revenue			
Total Revenue (per ton)	**$59.24**	**$153,111,348**	**$994,284,160**
Total Profit	**$16.40**	**$42,381,071**	**$125,208,640**

[1] The study collected the coal production data from the agreements. Cost figures and selling prices are obtained from the 2011 Consol Energy report (unit price figures were unable to obtain from Alpha Natural Resources). Total cost and revenue is presented for 2011 only.

[2] Per Exhibit 3A "Red Jacket Project Area – Road System No. 1 Component Reimbursable Costs Schedule" in the Red Jacket Agreement. Deduction based on marketable coal recovered between 1.5–2.5 million tons.

Table 5-14 Forecasted Coal Price and Revenue from 2012 to 2024*

Year	Selling Price (source : EIA)	Coal Prod. (Tons)	Total Cost	Total Revenue	Total Profit	Coal Prod. (Tons)	Total Cost	Total Revenue	Total Profit
		Red Jacket section				Buffalo Mountain section			
2011	$59.20								
2012	$56.50	152,035	$6,513,177	$8,589,978	$2,076,801	1,291,077	$66,851,963	$72,945,846	$6,093,883
2013	$55.80	152,035	$6,513,177	$8,483,553	$1,970,376	1,291,077	$66,851,963	$72,042,092	$5,190,129
2014	$54.80	152,035	$6,513,177	$8,331,518	$1,818,341	1,291,077	$66,851,963	$70,751,015	$3,899,052
2015	$54.20	152,035	$6,513,177	$8,240,297	$1,727,120	1,291,077	$66,851,963	$69,976,369	$3,124,406
2016	$54.20	152,035	$6,513,177	$8,240,297	$1,727,120	1,291,077	$66,851,963	$69,976,369	$3,124,406
2017	$54.50	152,035	$6,513,177	$8,285,908	$1,772,731	1,291,077	$66,851,963	$70,363,692	$3,511,729
2018	$54.30	152,035	$6,513,177	$8,255,501	$1,742,324	1,291,077	$66,851,963	$70,105,477	$3,253,514
2019	$54.30	152,035	$6,513,177	$8,255,501	$1,742,324	1,291,077	$66,851,963	$70,105,477	$3,253,514
2020	$55.00	152,035	$6,513,177	$8,361,925	$1,848,748	1,291,077	$66,851,963	$71,009,231	$4,157,268
2021	$54.60					1,291,077	$66,851,963	$70,492,800	$3,640,837
2022	$54.80					1,291,077	$66,851,963	$70,751,015	$3,899,052
2023	$54.90					1,291,077	$66,851,963	$70,880,123	$4,028,160
2024	$55.50					1,291,077	$66,851,963	$71,654,769	$4,802,806
Total		**1,368,315**	**$58,618,593**	**$75,044,476**	**$16,425,883**	**16,784,000**	**$869,075,520**	**$921,054,277**	**$51,978,757**

* Total tons of coal production are divided by the number of years required for construction (Red Jacket section: 17 years from 2004 to 2020; Buffalo Mountain section: 13 years from 2012 to 2024). 2011 has been excluded in the forecast of expected profit and revenue.

Travel Efficiency and Cost Savings

In order for a highway investment to be economically feasible, the economy in question must become more productive and generate improvements by receiving the investment than not (Decision Analyst, Inc., 2011). Transportation investment is mostly considered an economically feasible investment for an area; these projects tend to include benefits and changes in jobs, wages, business output and real estate values (Wilbur Smith Associates, 2006).

For the REMI model, this report uses the estimation of total travel efficiency and cost savings as given in the Chmura Economics & Analytics report (2009). Annual travel efficiency and cost savings of $23.6 million are predicted for Tolsia and KCH sections. This report uses the annual cost savings per mile ($0.16 million) to estimate an economic impact of completion of I-73/74 NHS Corridor.

The expansion of the I–73/74 NHS Corridor will generate sustainable economic improvements for the communities in its proximity. Existing businesses will see increased efficiencies at varying levels. Industries heavily dependent on highway travel and transportation will see the most significant productivity improvements. These improvements will be realized due to the

volume expansion of the road and the travel time savings associated with new construction. The KCH is expected to offer a travel time savings of 44% between Williamson and Bluefield. In combination, the KCH and the Tolsia Highway (Huntington to Williamson) will provide a 39% time savings for the Total I–73/74 route.

Based on a model developed in the Virginia I–73 study, Chmura Economics & Analytics estimated that West Virginia route would produce travel efficiency and cost savings valued at $23.6 million in 2020 (Table 5-15). If reinvested by businesses, the cost savings could support 139 new jobs or $7.8 million in additional wages among I–73/74 Corridor communities in 2020. Cost savings per dollar in on in Virginia section of I–73/74 were estimated at 6.5 cents. West Virginia cost savings are estimated at 2.8 cents per dollar of investment. The lower figures for West Virginia are attributed to lower traffic volumes in the state in comparison to Virginia. Average daily I–73/74 traffic volumes in Virginia are 36,000; West Virginia volumes are 16,495.

Table 5-15 Annual Travel Efficiency and Cost Savings in 2020

Highway Section	Annual Travel Efficiency and Cost Savings (Million $)
Tolsia Highway	$13.4
KCH	$10.2
Total	**$23.6**

Source: Chmura Economics & Analytics, 2009

Upon completion of the I-73/74 NHS Corridor, an increase in Vehicle Miles Traveled (VMT) is expected in the five counties in which the roadway passes through. It has been estimated that VMT on state highways increases, on average, by 0.6 to 0.7 percent at the county level for each 1 percent increase in highway miles and 0.9 percent on the metropolitan level (Hansen and Huang, 1997). An estimation of the VMT increase due to the I-73/74 NHS Corridor was performed using estimated VMT in the five counties.[3] The entire corridor will span 191 miles which is 29% of the total highway miles (638.84 miles) in the five counties and could result in a 17.4-20.3% increase in VMT once the roadway is complete.

Effects on the Service Industry

The I-73/74 NHS Corridor is expected make a direct economic impact to the areas surrounding the roadway. There will be a need for additional service related industries such as lodging, gas stations, fast-food or sit down restaurants. To analyze the effects the roadway will have on the service industry in West Virginia, service industry employment data was gathered for Corridor G/US 119, a similar route which runs from Mingo County to Kanawha County. Construction on the West Virginia portion of US 119 began in 1972 and was completed in 1997 when the roadway extended to South Charleston, WV. Employment, annual wage and number of service establishment data was gathered to analyze the impact on Corridor G counties, including Boone,

[3] The report used the ratio (8.5%) of a number of vehicles registered in the five counties to the state of West Virginia to estimate VMT in the five counties from published VMT in West Virginia.

Kanawha, Lincoln, Logan and Mingo County after the corridor was completed in 1997. The percentage change in total annual pay, total employees and total establishments as compared to 1997 figures was calculated and summarized in Table 16. As shown in the table, the average percentage change in total annual pay in the Corridor G counties is 27.38% following the portions construction (approximately 77.6 miles). This figure was used to estimate an economic impact of the completion of I-73/74 NHS Corridor in the study region.

Table 5-16 shows the percent change in total service industry payroll, total employees, and total establishments for years 1998-2009. Total annual industry payroll increased an average of 27.86% over the observed years, total employees increased an average of 8.18% over the observed years and total establishments fell by 1.76% over the observed years.

Table 5-16 Corridor G Service Industry Percent Change (Compared to 1997 Data)

Year	Total Annual Payroll ($1,000)	% Change	Total Employees	% Change	Total Establishments	% Change
1997	109,952		11,184		797	
1998	116,842	6.27%	11,269	0.76%	788	-1.13%
1999	122,002	10.96%	11,455	2.42%	772	-3.14%
2000	129,209	17.51%	12,130	8.46%	791	-0.75%
2001	131,036	19.18%	11,830	5.78%	764	-4.14%
2002	135,713	23.43%	11,861	6.05%	777	-2.51%
2003	140,916	28.16%	12,385	10.74%	786	-1.38%
2004	139,856	27.20%	12,290	9.89%	806	1.13%
2005	145,246	32.10%	12,194	9.03%	802	0.63%
2006	152,736	38.91%	12,788	14.34%	799	0.25%
2007	156,055	41.93%	12,441	11.24%	804	0.88%
2008	155,470	41.40%	12,170	8.82%	750	-5.90%
2009	161,959	47.30%	12,375	10.65%	757	-5.02%
Avg.		27.86%		8.18%		-1.76%

Source: United States Census Bureau County Business Patterns, 2011c

In Table 5-16, this report found an average of a 27.86% increase in total annual payroll in service industry after the completion of Corridor G. Using this figure, the report estimates $15.27 million increase ($54.8 million * 0.27) in service industry in the five counties for I-73/74 NHS Corridor project. Annual payroll in gas, hotel, and food industry in the five counties adjacent to the I-73/74 NHS Corridor was 54.8 million in 2009.

Accident Cost Savings

Safety is a major issue that can affect an evaluation of a transportation project. For example, Wilbur Smith Associates (1998) studied economic effects of the Appalachian Regional Commission's 12 completed corridors on the Appalachian Development Highway System (ADHS). The completed corridors serve 165 counties in the Appalachian region and are

considered to be the most affected by the improvements made. Results were found by comparing the cost of traveling on the ADHS to the applicable costs if these corridors did not exist. The study focused on increasing certain economic benefits: travel time savings, vehicle operating cost savings and accident reduction cost savings. Focusing on accident reduction cost savings—safety—these highways were built as, or upgraded to, 4-lane highways; higher standard 4-lane highways are safer than lower standard 2-lane highways (Wilbur Smith Associates, 1998). Along with larger highways, the new ADHS roadways reduced curves and grades to improve visibility. The study gauged accident reduction benefits by assigning monetary values to damages sustained from motor vehicle accidents. Based on data from 1994, each accident accumulates $1,600 in property damage to the vehicle, $2,854,000 per fatality, $654,000 per seriously injured person and $20,600 for every other injured person; these amounts continue to rise every year (Wilbur Smith Associates, 1998). Table 5-17 displays the expected safety benefits by corridor for the years between 1995 and 2024 along with the mean and median annual benefits.

Table 5-17 Accident Cost Savings ($, Thousands)

Corridor	A/A1	B	D	E	F	I
Annual Accident Benefits						
Year 1995	($6,032)	$22,564	$9,753	($3,697)	$2,923	$1,217
Year 2024	(12,114)	43,035	15,300	(8,251)	5,337	1,727
Mean (1)	(7,742)	21,373	9,154	(3,891)	2,976	1,132
Median (1)	(7,920)	23,270	10,040	(3,854)	3,007	1,235
Total Undiscounted Benefits						
1965-2995	($45,218)	$234,264	$136,822	($42,573)	$45,712	$20,332
1996-2024	(272,190)	983,984	375,796	(179,218)	123,907	44,166
Total	**($317,408)**	**$1,218,247**	**$512,618**	**($221,790)**	**$169,619**	**$64,498**
Corridor	**J**	**L**	**P**	**Q**	**T**	**Total**
Annual Accident Benefits						
Year 1995	($1,256)	$6,253	($743)	$9,575	$6,909	$47,449
Year 2024	(12,648)	16,774	(1,558)	19,077	13,540	80,220
Mean (1)	(3,872)	7,340	(1,016)	9,770	7,501	43,553
Median (1)	(2,042)	7,144	(982)	9,739	7,366	48,014
Total Undiscounted Benefits						
1965-2995	($4,403)	$45,807	($22,376)	$136,874	$105,805	$611,046
1996-2024	(208,561)	345,138	(34,514)	429,786	306,740	1,915,035
Total	**($212,964)**	**$390,945**	**($56,891)**	**$566,660**	**$412,545**	**$2,526,080**

Source: Wilbur Smith Associates, 1998

In addition, Cambridge Systematics, Inc. (2009) produced a feasibility study of the Illiana Expressway in Indiana and Illinois; their main concerns for the highway were safety and reliability, travel time and delay, economic issues, accessibility and connectivity and consistency

with regional planning. In this case, construction on the expressway would greatly impact traffic patterns, thus affecting the frequency and severity of crashes along with emergency services to aid these incidents. Reducing fatal crashes is a top concern for the departments of transportation. In 2006, 42,642 people were killed and 2.6 million were injured in the United States due to motor vehicle crashes; motor vehicle crashes also remain the leading cause of death for persons ages 3 to 6 and 8 to 34 and the leading killer in accidental death (Cambridge Systematics, Inc., 2009). Though trends show a decrease in these accidents, it is projected that they will increase in the future; precautions need to be taken as early as possible. High, or rising, numbers of crash rates is a good indicator of safety issues. Table 5-18 provides the crash rates for selected roadways along the Illiana Expressway from 2001 to 2006.

Table 5-18 Accident Cost Savings ($, Thousands)

	Crashes (All Vehicles) per 100 MVMT		Truck Involved Crashes per (Truck) 100 MVMT	
Facility	**Total**	**Fatal**	**Total**	**Fatal**
Cross-State (weighted averages from IL-IN)				
I-80	129.59	0.53	313.27	1.72
US 30	267.51	1.61	258.00	3.98
Indiana (annual average from 2003-2006)				
I-65	137.77	0.61	122.45	1.38
I-90	119.98	0.56	157.75	0
US 41	474.14	1.34	524.77	1.29
US 20	427.76	1.95	567.80	2.18
US 12	769.42	5.26	787.01	16.57
US 231	328.51	3.71	296.25	11.39
US 6	92.88	0	31.31	0
IN 53	545.75	2.92	343.57	0
IN 55	723.28	3.08	323.50	4.76
IN 2	310.73	2.62	655.00	13.10
Illinois (annual average from 2001-2006)				
I-57	70.04	0.90	97.28	1.31
US 45	340.03	1.31	302.08	5.21
IL 1	402.62	1.75	339.80	2.79
IL 50	307.26	1.77	227.24	7.84
IL 394	131.74	1.94	145.07	3.52
All	**372.59**	**1.99**	**387.18**	**4.73**

Source: Cambridge Systematics Inc., 2009

Therefore, this report includes the impact of safety improvement of new highways. For the REMI analysis in this report, we collected fatal and non-fatal crash data for the Corridor G to estimate the safety impact of the completion of I-73/74 NHS Corridor in the five counties. The fatal accident data are collected from the National Highway Traffic Safety Administration

(NHTSA, 2011a) division of FARS (Fatality Analysis Reporting System) while non-fatal crash data are obtained from WVDOT.

Table 5-19 shows the percent change in fatal crashes in Corridor G counties for years 1998-2009. The percent changed are calculated using 1997 as a base year. That is, each individual year's (1998-2009) total fatal crashes are compared to the total fatal crashes in 1997. Years 2008 and 2009 showed the largest decreases in fatal crashes, both down 26.03% from 1997. The two years showing largest increases in fatal crashes were 2000 and 2007; up 15.07% and 12.33%, respectively. The average change in fatal crashes for years 1998 to 2009 was -2.40%.

Table 5-19 Change in Fatal Crashes in the Corridor G Counties (Compared to 1997 data)

	Boone	Kanawha	Lincoln	Logan	Mingo	Total	% Change
1997	7	41	7	7	11	73	
1998	9	44	10	9	6	78	6.85%
1999	11	35	13	5	8	72	-1.37%
2000	7	52	7	14	4	84	15.07%
2001	5	36	7	8	11	67	-8.22%
2002	9	44	6	9	4	72	-1.37%
2003	9	42	6	7	14	78	6.85%
2004	5	28	16	8	8	65	-10.96%
2005	5	31	9	11	14	70	-4.11%
2006	15	35	9	11	9	79	8.22%
2007	13	43	7	7	12	82	12.33%
2008	6	25	8	9	6	54	-26.03%
2009	12	25	5	7	5	54	-26.03%
Avg.							**-2.40%**

Source: NHTSA, 2011b

Table 5-20 shows the percent change in non-fatal crashes in corridor G counties. Yearly totals of non-fatal crashes from 2000-2009 are compared to the base year of 1999 to calculate the percent changes. Years 2008 and 2009 display the largest decreases in non-fatal crashes; -16.46% and -15.48%, respectively. The years displaying the largest increases in non-fatal crashes were 2003 and 2001; 5.23% and 4.12%, respectively. On average, Non-fatal crashes have fallen 4.01% over the observed years 2000-2009.

Table 5-20 Change in Non-Fatal Crashes in the Corridor G Counties (Compared to 1999 data)*

	Boone	Kanawha	Lincoln	Logan	Mingo	Total	% Change
1999	613	7,296	388	503	442	9,242	
2000	651	7,392	373	504	450	9,370	1.38%
2001	678	7,248	370	820	507	9,623	4.12%
2002	667	6,651	353	902	492	9,065	-1.92%
2003	703	7,452	356	829	385	9,725	5.23%
2004	646	7,192	368	803	468	9,477	2.54%
2005	677	6,595	323	769	432	8,796	-4.83%
2006	748	6,474	335	787	460	8,804	-4.74%
2007	663	6,417	197	682	360	8,319	-9.99%
2008	582	5,898	215	691	335	7,721	-16.46%
2009	455	6,252	195	607	302	7,811	-15.48%
Avg.							**-4.01%**

* Non-fatal crash data prior to 1999 are not available.
Source: WVDOT, 2011

From Table 5-19, we found there was an average of 2.4% reduction of fatal accidents on the highway after the completion of Corridor G. According to a recent report by North Carolina DOT (2010), $4.4 million of comprehensive cost per fatal crash is estimated. For non-fatal crashes, $5,000 is estimated for property damage only crashes. Using these figures, this report estimates $5.1 million (= $4.4 million*0.024*43 fatal crashes + $5,000*0.04*2,982 non-fatal crashes) of safety benefits from the completion of I-73/74 in the five counties.

Estimated Short- and Long-run Impacts of the I-73/74 NHS Corridor

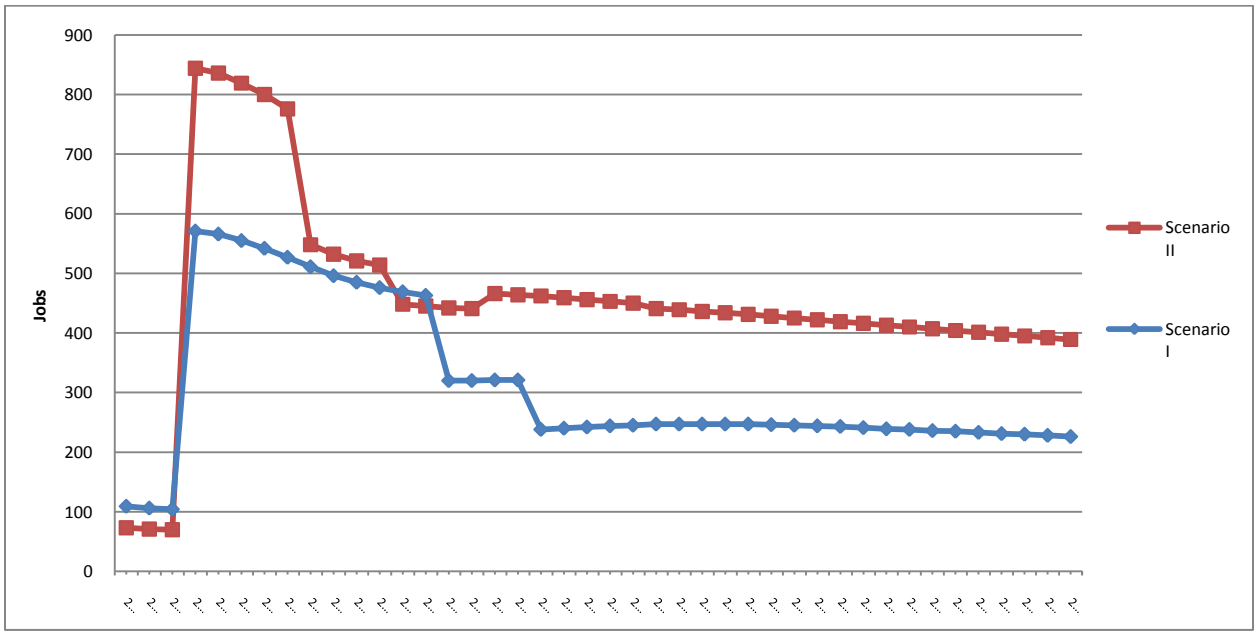
Based on the model assumptions and input values, this study estimates the short- and long-run economic impacts of I-73/74 NHS corridor. The results from REMI analysis will show changes in major macro-economic indicators (e.g., employments, gross regional production, and personal income). In particular, the study compares the economic impacts of completion of the I-73/74 NHS Corridor without and with the use of P3s. Therefore, the findings of the REMI analysis can be used to evaluate the adoption of P3s for highway projects in West Virginia. The economic impacts of the I-73/74 NHS Corridor in the five counties from 2012 to 2050 are presented in the four categories.

- Total employment
- Gross regional product
- Personal income
- Industry output

Total Employment

The net economic impacts of the I-73/74 NHS Corridor are simulated by the REMI TranSight model. Figure 5-8 shows the estimated job creation of the I-73/74 NHS Corridor for the two scenarios. The results clearly show that both scenarios have a positive impact on total employment for all five counties along the corridor. However, using P3s in Scenario II shows larger impacts on total employment due mainly to the faster completion of the roadway. In both scenarios, total employment peaks in 2012 when construction begins, 571 jobs for Scenario I and 844 jobs in Scenario II. However, total employment gradually decreases most years until 2027 and remains relatively consistent through 2050.

Figure 5-8 Net Economic Impacts of the I-73/74 NHS Corridor on Total Employment



Furthermore, the study shows the estimated job creation by industry sector for Scenarios I and II (Figures 5-9 and 5-10). The six major sectors selected (construction, wholesale trade, retail trade, transportation/warehousing, health care/social assistance, and accommodation/food services) are most likely to have a greater presence on the corridor than other sectors. The results show that construction peaks in the short-run, particularly in 2012 as numerous jobs are created to construct the roadway. Scenario I has estimated 452 construction jobs in 2012 while Scenario II has estimated 642 construction jobs in the same year. As construction is completed the estimates decrease each year until the years 2023 (Scenario I) and 2032 (Scenario II) when the decrease is coupled with an immediate increase in the service industry. In these years, Scenario I service employment increases to 74 jobs and Scenario II increases to 73 jobs. This indicates that the long-run impact of the corridor is derived largely from service industry job creation.

Figure 5-9 Employment Impact by Industry Sector (Scenario I)

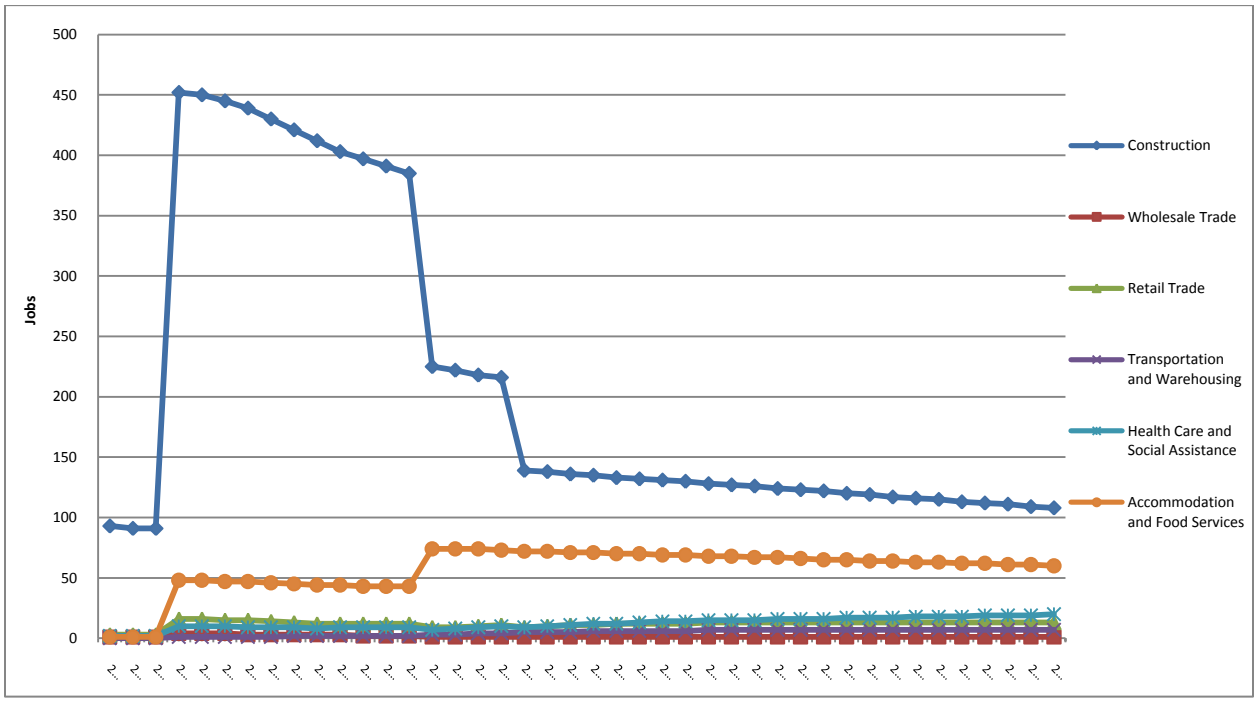
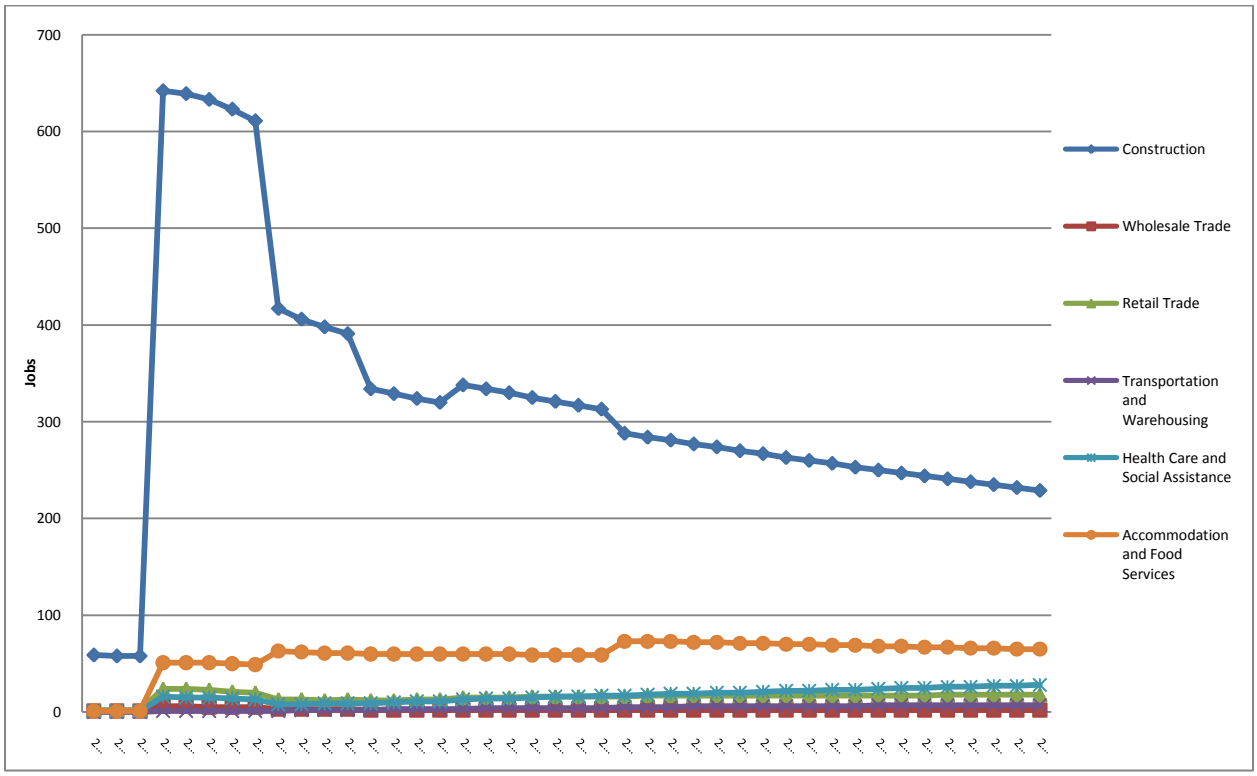


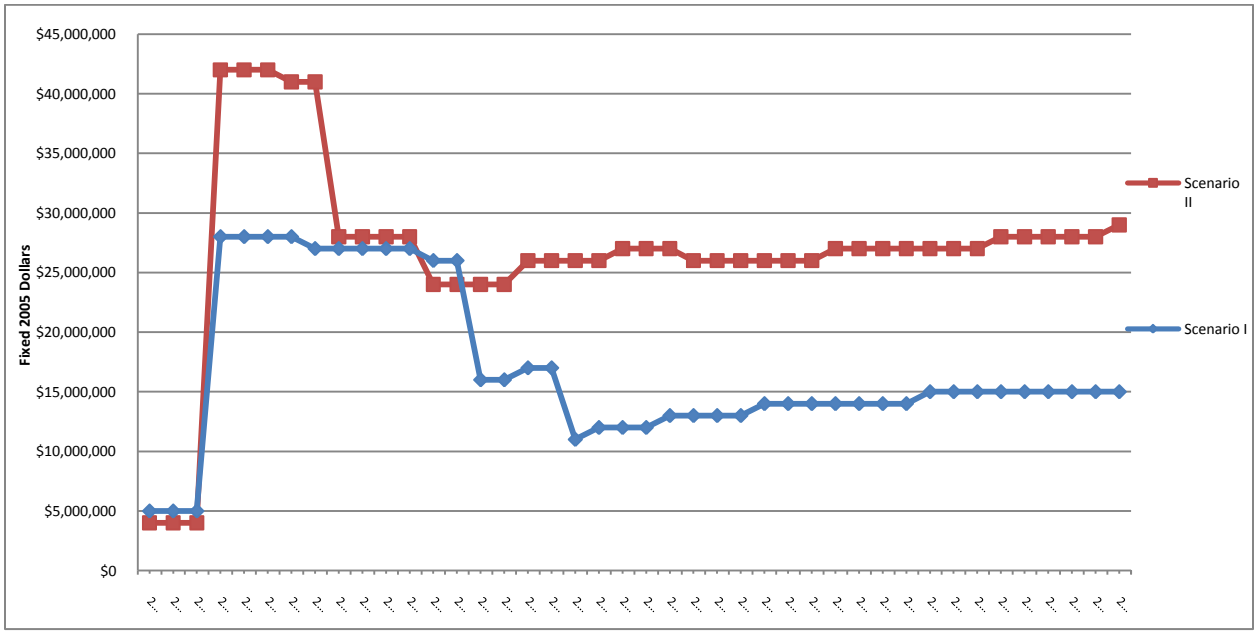
Figure 5-10 Employment Impact by Industry Sector (Scenario II)



Gross Regional Product (GRP)

Net economic impacts on the GRP (Figure 5-11) show a similar result. Both scenarios are overall positive to the five county region; however Scenario II provides faster and greater impacts than Scenario I. With the beginning of construction in 2012, GRP has been estimated at $28 million for Scenario I and $42 million for Scenario II. Our findings show the positive impact of using P3s as Scenario II offers a consistently and in most cases substantially higher GRP during the remaining 38 years of the study period. For example, in 2028, GRP is estimated at $12 million for Scenario I as compared to $26 million in Scenario II. In 2050, GRP is estimated at $15 million for Scenario I and $29 million for Scenario II.

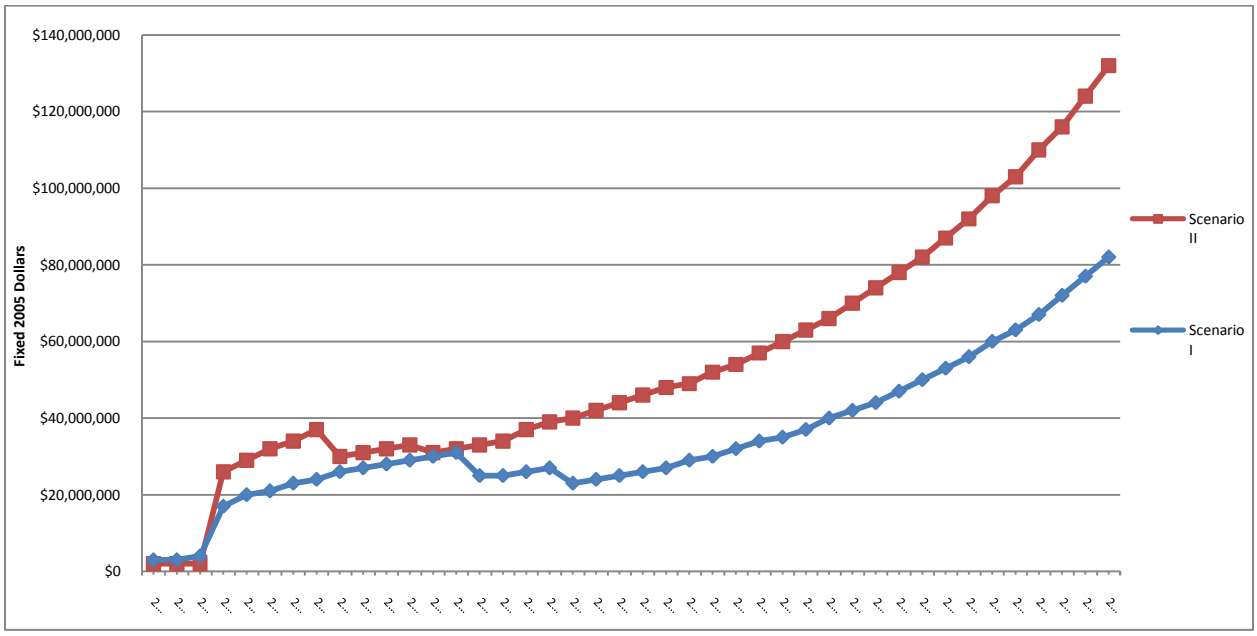
Figure 5-11 Net Economic Impacts of the I-73/74 NHS Corridor on Gross Regional Product



Personal Income

Personal income will experience a substantial increase during the study period as shown in Figure 5-12. The construction and subsequent completion of the I-73/74 NHS Corridor will positively impact personal income in the five county area as a number of jobs are created, mostly in construction and the service industry (Figures 5-10 and 5-11). In 2012, personal income of Scenario I is an estimated $17 million and increases for all years except for 2023 and 2027 where modest decreases are shown. In 2050 Scenario I personal income is expected to have increased to $82 million, almost 5 times higher than the 2012 level. Scenario II displays similar results but on a larger scale. Personal income increases all years with the exception of 2017 and 2021. However, between the years of 2012 and 2050 personal income increases approximately five times from $26 million to $132 million. The results indicate that while the long-run effects of each scenario on personal income are similar, the amount of the impact varies greatly.

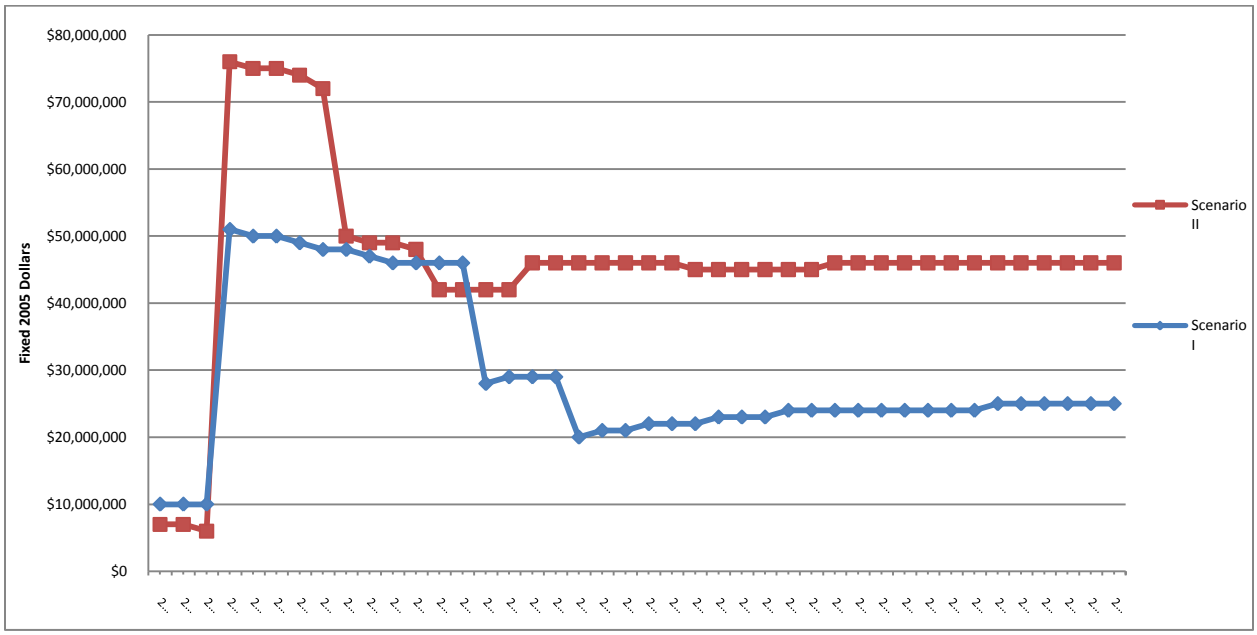
Figure 5-12 Net Economic Impacts of the I-73/74 NHS Corridor on Personal Income



Industry Output

Industry output results (Figure 5-13) are consistent with the other REMI results and show that using P3s provides greater estimated impacts than Scenario I. Industry output will be high in the short-run when construction begins due to the increased number of construction jobs. In 2012 industry output is estimated at $51 million and $76 million for Scenario 1 and Scenario II respectively. In the long-run, Scenario I output is estimated at $20 million in 2027 and increases modestly year-over-year until 2050 when it reaches $25 million. Scenario II experiences the same trend as industry output is estimated at $42 million in 2024 and increases most years until 2050 when it reaches $46 million.

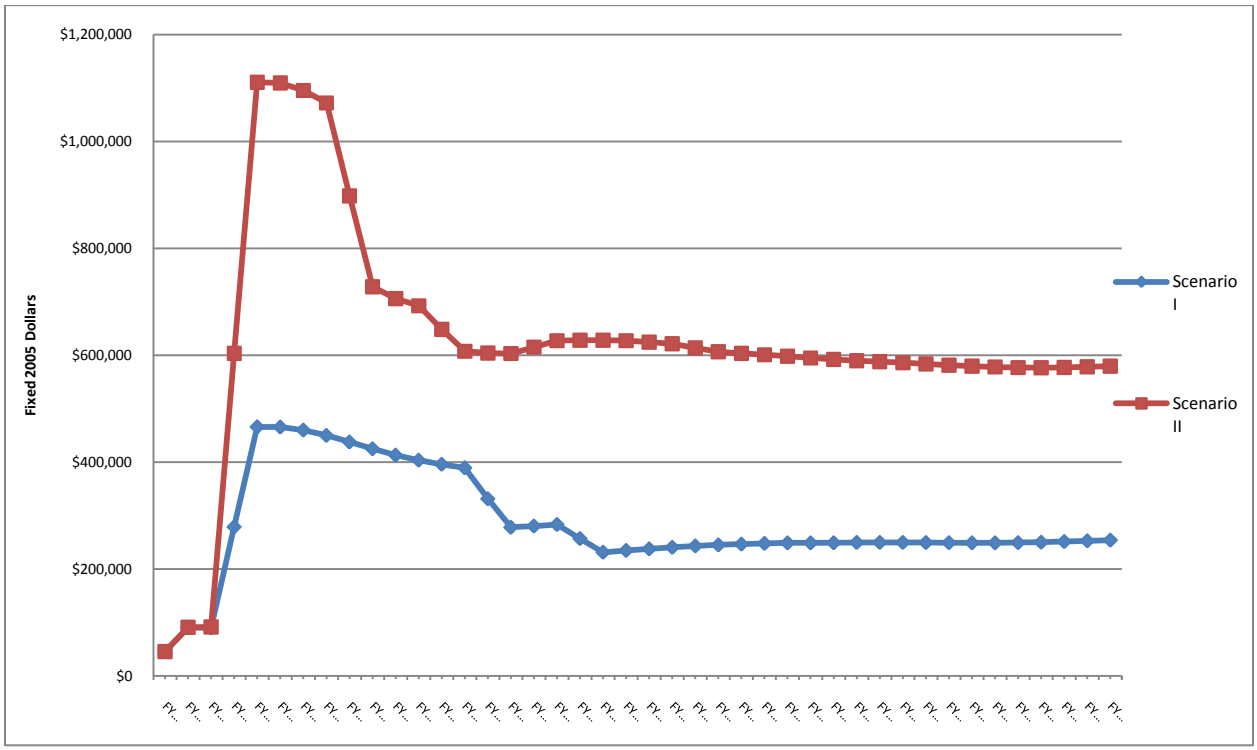
Figure 5-13 Net Economic Impacts of the I-73/74 NHS Corridor on Industry Output



Fiscal Impact

REMI provides a customized tax spreadsheet to estimate the fiscal impacts in a region as a result of policy change. The data calculated by REMI combines actual fiscal data and economic and demographic data in order to produce year-by-year revenue and expenditure results. Revenue and expenditure categories for the region are determined and a driver from the REMI model is assigned to each category. For example, personal income tax is assumed to be driven by the total wage and salary in the region so wage and salary data from the REMI model is extracted to estimate the personal income tax revenue as a result of a policy change. Actual or estimated fiscal data, with a minimum of one year of historical data is then used to calculate the amount of revenue collected or expenditure spent per dollar of GRP, per capital stock, per person, depending on the driver of the category. Statewide year-over-year tax revenue change estimates are shown on Figure 5-14 and a summary of selected revenue follows (Tables 5-21 and 5-22).

Figure 5-14 Statewide Tax Revenue Changes FY2009 – FY2050



The statewide fiscal impact of Scenario I (Table 5-21) and Scenario II (Table 5-22) exhibit a similar trend as shown in the long and short-run economic impacts of each scenario. While both options provide substantial and positive fiscal impacts, using P3s to create the roadway offers greater and faster impacts. In FY2012, there is a considerable difference in the estimated change in all revenues for both scenarios. Total 2012 tax revenue changes for Scenario I is estimated at $278,823 while Scenario II is $603,426. In regards to specific tax revenue changes, the Scenario II increase of $5,032 in Business and Occupation (B&O) tax for FY2012 is approximately 40 times that of the Scenario I estimate of $125. This trend continues in future years and in FY2013 Scenario II offers significantly higher B&O tax revenue changes than Scenario I; $8,515 and $128 respectively. While FY2050 brings a larger decrease in B&O taxes for Scenario II due to the completion of construction, the difference in the overall revenue impact between the scenarios is substantial as Scenario II offers $579,478 as compared to $254,014 in Scenario I. Overall, Scenario II ($603,426, $1,110,515 and $579,478) provides much larger tax revenue increases in these three years than Scenario I ($278,823, $465,993 and $254,014).

Table 5-21 Scenario I Statewide Tax Revenue Changes (Fixed 2005 Dollars)

Revenues	FY2012	FY2013	FY2050
Business and Occupation	$125	$128	($2,626)
Consumer Sales Tax	$137,572	$230,265	$176,438
Personal Income Tax	$4,954	$8,137	$755
Cigarette Tax	$9,829	$17,402	$24,602
Property Tax	$48	$101	$445
Insurance Tax	$87	$153	$250
Corporate Income/ Business Franchise Tax	$128,841	$215,174	$64,949
Severance Tax	($2,508)	($5,238)	($13,425)
Revenue Impact	**$278,823**	**$465,993**	**$254,014**

Table 5-22 Scenario II Statewide Tax Revenue Changes (Fixed 2005 Dollars)

Revenues	FY2012	FY2013	FY2050
Business and Occupation	$5,032	$8,515	($8,548)
Consumer Sales Tax	$310,240	$574,144	$398,776
Personal Income Tax	$10,146	$18,419	$2,199
Cigarette Tax	$19,471	$38,303	$50,399
Property Tax	$98	$248	$1,058
Insurance Tax	$359	$641	$281
Corporate Income/ Business Franchise Tax	$264,106	$483,220	$158,583
Severance Tax	($995)	($4,460)	($31,817)
Revenue Impact	**$603,426**	**$1,110,515**	**$579,478**

Conclusion

This chapter provides a review of literature on economic impact studies on a highway project. Based on the existing literature and personal contacts, the study develops a REMI model to investigate short- and long-run regional economic impacts of the I-73/74 NHS Corridor in the five counties. The study develops the two scenarios to evaluate the economic value of using P3s to construct the I-73/74 NHS Corridor: Scenario I uses an assumption of completion of the corridor with full government spending and without the use of P3s, while Scenario II adopts P3s. The REMI results show that while both scenarios have a positive impact on the study region and Scenario II has larger economic benefits than Scenario I in terms of total employment, gross regional product, and personal income. Also, our findings provide that immediate construction facilitates short-run growth in the construction sector while increases in the service industry sector can be expected in the long-run. Consequently, the use of P3s is expected to have a positive fiscal revenue impact to the state of West Virginia. In summary, this chapter shows the

importance of I-73/74 NHS Corridor on the economic future of the five counties and emphasizes that not only will a P3 deliver significant cost and time savings, but the impact is substantially greater than using a traditional delivery method. Thus, information from this chapter can be used to advance the understanding of potential regional economic impacts of I-73/74 NHS Corridor with P3s in West Virginia.

CHAPTER 6: POTENTIAL P3 PROJECT CONTRACT MANAGEMENT AND IMPLEMENTATION

Important stages of P3s are the creation, proper management and, ultimately, the implementation of a contract outlining the project. Existing state and federal legal responsibilities are to be observed and all of the key determinants of ownership should be specified early on in the P3 process. P3 contracts must follow the recommended or required land use plans, as completed by each surface mined county in West Virginia. Developing appropriate incentives that not only benefit the state but the private entity engaged in a P3 can increase the likelihood of P3 participation.

Legal Liabilities

A January 2009 report sponsored by the National Cooperative Highway Research Program outlined the major legal issues for highway P3s. Insufficient state legislation is a key obstacle to P3 development. Other legal issues include limitations on public and private financing methods, environmental review requirements, labor and employment laws and public procurement standards.

Some states prohibit the mixing of public and private funds on a highway project; creating legislation that permits the public project sponsors to lend public funds to private entities is vital. Legislation may be necessary to allow for ownership, leasing or controlling of highways and other public assets by private entities. State and local transportation agencies will often disallow performance-based procurement and require contracts to be awarded based on low bids which ignore total aggregate costs or other benefits from a performance-based contract. USDOT Model Legislation suggests sealed bidding, selecting proposals based on qualifications and value or awarding contracts based on a reasonable process. For unsolicited proposals, some states have set up restrictions and regulations on their acceptance.

Tort liability represents significant costs for the private sector. Most states have sovereign immunity protections, prohibitions on punitive damages against a state agency or have established a cap on the amount of tort damages recoverable against a state agency. A private entity will be hesitant to participate in a P3 unless similar protections are offered and the costs of insurance to cover exposure to potential damages can be significant. State legislation can be created that limits tort claims against a private entity. For example, in Mississippi legislation was enacted to protect the private partner. The legislation provided that tort claims against the private partner would be limited to sovereign immunity caps of the state; it is generally agreed that sharing immunity can help mitigate liability concerns (NCHRP, 2009).

Projects using P3s for highway infrastructure construction and development are subject to the applicable labor laws and standards. The Davis-Bacon Act requires that each contract over $2,000 in which the United States or the District of Columbia is a party for the construction,

alteration or repair of public works or buildings will contain a clause setting forth the minimum wages to workers. This clause covers the various types of laborers and mechanics employed under the contract. Contractors or subcontractors are required to pay onsite workers the locally prevailing wages and fringe benefits paid on similar projects. In addition to the Davis-Bacon Act, Congress has added prevailing wage provisions to statutes that aid construction projects through grants, loans, loan guarantees and insurance.

The Buy American Act restricts the purchase of supplies that are not domestic end products for use in the United States. Foreign end products can be purchased if it is determined that the price of the lowest domestic offer is unreasonable. Under the Buy American Act, the Secretary of Transportation shall not obligate any funds unless steel, iron and manufactured products used in a project are produced in the United States. The requirement may be waived if usage is inconsistent with public interest; the needed materials and products are not produced in the United States with the desired quality or needed quantities or, if including the domestic material will increase the cost of the overall project by more than 25 percent.

Other legal considerations of a P3 can be classified as statutory-based or negotiation-based. Statutory-based legal provisions are aimed at creating the formalities behind a P3. In regards to the KCH and future P3s, several provisions are of importance: properly establishing the legal capacity and requirements of both the state and private entity, creating the process for dispute resolution, establishing borrowing restrictions for the private entity and proper land acquisition, use and disposal.

Negotiation-based legal provisions are needed in the creation of any contract, but are particularly important when establishing a P3. The state needs to establish the appropriate oversight and monitoring procedures to ensure that the final product meets the desired specification. This can be accomplished by being proactive, rather than reactive, and including the necessary provisions for monitoring the project. The legal aspects of contract management that will allow contract renegotiation and changes in design standards or construction specifications are highly important. Further statutory-based and negotiation-based legal provisions are summarized in Table 6-1.

Table 6-1 Statutory-Based and Negotiation-Based Legal Provisions for Transportation P3s.

Statutory-Based	Negotiation-Based
• Legal capacity and requirements of the parties involved. • Existence and legal basis of cost recovery and tolling. • Authority to regulate toll rates, toll exemptions and services. • Dispute resolution and liability. • Competition and anti-trust regulations. • Avoidance of conflicts of interest. • Public sector borrowing restrictions • Tax and accounting liabilities • Contract provisions and surety requirements. • Property and intelligent property laws. • Authority of other government entities over infrastructure assets and access. • Property issues of land acquisition, condemnation, use and disposal.	• Administrative coordination. • Oversight and monitoring procedures. • Ability/restrictions over transfer of private contract duties. • Contract re-negotiation, re-financing, hand-back provisions and assignment of rights. • Competing facilities provisions. • Treatment of windfall profits. • Public control or limitations on private refinancing. • Authority over advertising or facility branding rights. • Ability to provide guarantees. • Changes in design standards or construction specifications during development. • Changes in public policy towards P3s.

Source: U.S. Department of Transportation Federal Highway Administration, 2007.

Ownership Issues

Ownership can be established when the P3 method is selected; however, the appropriate provisions are necessary for handing the project back to the state. Some states may authorize a design-build P3 but not allow state or local entities to engage in a long-term lease or other financing transactions. In addition to the prohibition of using several forms of P3, ownership issues can arise and will often require legal action to remedy the situation. Legislation may be necessary to provide for the owning, leasing or control of highways by a private entity. In *Pohl v. State Highway Commission*, the Missouri Supreme Court maintained that toll roads not owned and operated by the Missouri Highways and Transportation Commission are not considered part of the state highway system and State Road Fund Money could not be used. As a result, legislation was created that authorizes the lease of a transportation facility to a private entity but does not allow ownership to transfer out of public control (NCHRP, 2009). West Virginia HB 4476, §17-27-17 prohibits the acquisition, construction, improvement or financing of transportation facilities with any State Road Fund money unless they are a required match for federal funds earmarked in a federal authorization or appropriation bill. However, the use of federal funds in connection with the financing of a qualifying transportation facility must be compatible with the state transportation plan and local comprehensive plans.

Ownership can create property tax issues due to a long-term lease or other arrangement that gives the private sector possession and control over highway infrastructure. Ordinarily, these facilities are exempt from state and local property taxes and special assessments when they are owned and controlled by the government. However, a long-term lease or ownership by the private entity might not qualify for these exemptions (NCHRP, 2009). The state provides exemptions from taxation for a P3 and further states that as construction, acquisition, improvement, operation and maintenance of qualifying transportation facilities will constitute the performance of essential governmental functions, a developer is not required to pay any taxes or any assessments on the facility or property acquired or used.[4]

Land Use Plans

Highway Corridors

Mountaintop Removal Mining (MTR) is a polarizing issue for developers and environmentalists. The challenge is to find a middle-ground where MTR becomes a tool to provide developable flat land with access to utility and transportation services. Post Mining Land Use Master Plans (PMLUMP) can help stakeholders in the coalfield counties maximize the economic development benefits of new highway corridors.

From 2007 to 2020, the construction of I-73 is projected to generate $2.8 billion in economic impact in the corridor region. Of this total, $2.0 billion is direct construction spending while $0.8 billion is the ripple economic impact of the construction. According to Chmura Economics & Analytics (2009), the construction of I-73 is expected to support an average of 1,222 new jobs per year from 2007 through 2020, and an additional 449 jobs per year in the region because of the ripple effect. This sums to an average of 1,661 jobs per year during the construction phase. Forty-two percent of the economic impact from the construction of I-73 is expected to occur in the Tolsia Highway Corridor with the rest occurring in the King Coal Highway Corridor.

Post Mining Land Use Master Plans

In 2001, the West Virginia Legislature passed Senate Bill 603 which empowers county governments to plan for the reclamation of surface mines and their post mining land uses. The bill requires all surface mining permits to have a reclamation plan and makes County Commissions responsible for preparing Post Mine Land Use Master Plans (PMLUMP). Instead of automatically requiring that reclaimed surface mines be returned to the Approximate Original Contour (AOC) as in the past, the PMLUMP may recommend the reclamation of surface mine properties for higher and better land uses. The PMLUMP will save the county and state construction costs by setting standards for reclamation and development of surface mine sites by the mining companies, and determining the land use and infrastructure needs within counties. Through P3s, the surface mining process will provide the developable flat land required to help diversify the local coal-dependent economy. Some diverse PMLU projects in Mingo County

[4] West Virginia Code §17-27-17

designated to create jobs and generate revenue include an industrial park, a fish hatchery and Twisted Gun Golf Course.

In 2009, the West Virginia State Legislature passed Senate Bill 1011 as an addendum to SB 603 and supplements the bill with additional provisions (SB1011, 2009).

- As of July 1, 2009, all counties with surface mined properties are required to have a PMLUMP.
- County Commissions must approve infrastructure component standards and appoint the appropriate entity to be responsible for the development of the PMLUMP.
- The Office of Coalfield Community Development (OCCD) must approve each PMLUMP in order for it to take effect.
- The OCCD must assist, if requested, in the preparation of the PMLUMPs.
- Surface mined operations must agree with the PMLUMP.
- Counties must update their PMLUMP every three years.
- All plans must include a county map with all surface mine permit boundaries, areas designated for development using OSM approved language such as commercial, industrial, housing, agricultural, residential and others.

It is imperative that each plan include information from the Community Impact Statement, a document prepared by the mining operator and submitted to the OCCD within sixty days of the filing of a surface mining application.

Mingo, Mercer, McDowell, Wyoming and Wayne, the counties directly involved in the KCH, are required to complete a PMLUMP. The overall decline in mining employment since the 1900s has not diminished the importance of the coal industry to these counties. With the support of the OCCD, creation of P3s and the implementation of the PMLUMP, counties can facilitate development opportunities on surface mine sites that will help them achieve sustainable economic diversity while fostering livable communities.

Mingo County

As outlined in the PMLU plan completed by E.L. Robinson Engineering Co., Mingo County established three goals to insure adequate use of post mine land. The first was to ensure beneficial and acceptable future land use patterns as an alternative while maintaining characteristics of the county and creating flexible guidelines allowing social and economic benefits. Secondly, Mingo County would use post mine land to ensure economic sustainability through job creation and economic development opportunities, increasing the revenue base with new or expanded business opportunities, planning infrastructure in accordance with economic development opportunities and generating developable land opportunities as new roadways are built and coal is mined. Finally, Mingo County aims to provide pleasing visual characteristics by incorporating quality design, constructing utilities underground, applying appropriate signage,

identifying needs of visual and noise buffers, and providing landscaping and coordination of community planning, highway design and coal mining activities (E.L. Robinson, n.d.).

Mingo County has developed criteria and standards for potential projects to maximize the use of post mine land. Distance is a key factor in determining the feasibility of a project as the proximity of an existing or proposed four-lane highway, interstate, or interchange and rail access are taken heavily into consideration. The size of the site and availability of electricity, water, gas and sewage are key components of the land use criteria as well. Mingo County requires all infrastructures to be constructed on 5 percent of the post developable area in the initial phase. Access roads will be designed and constructed in accordance with WVDOH standards; water and waste systems built to comply with West Virginia Bureau for Health standards and all utilities on the site are to remain in place.

The E.L. Robinson report also establishes several categories for the land usage: industrial, commercial, residential, agricultural, recreational, and public. Industrial projects include manufacturing, hardwood facilities, power plants, machine shops, a transportation park, and trucking and air cargo facilities. Commercial projects include restaurants, hotels, shopping centers, theaters, a business/high-tech park, a research park and warehousing availability. Residential usage encompasses single family houses, multi-family apartment complexes, retirement communities, upscale housing communities and resort communities. Crop lands, grazing, farming and processing units are included under the agricultural category. Public facility uses include educational facilities, government complexes, health care, nursing homes and cultural/historical centers. Perhaps the most creative category, recreation includes projects such as golf courses, parks, athletic fields, fair grounds, motor sports complexes, 2 and 4 wheel ATV parks, trails, wild life refuges and outdoor activities/facilities. Lastly, forest land provides an opportunity for managed timber projects in addition to aesthetically pleasing locations.

Table 6-2 Advantages of Land Use Types in Mingo County

Category	Advantages
Industrial	• Generates high taxes for the county. • Creates competitive property values. • Creates high paying jobs. • Potential attractive use of space. • Additional children in school system.
Commercial/Retail	• Generates taxes for the county. • Generates high value property. • Creates jobs. • Additional children in school system.
Residential	• Increases population base. • Greater housing options. • Ensures infrastructure requirements are met. • Provides use of rugged terrain. • Additional children in school system.
Agricultural	• Provides agricultural activities. • Minimal infrastructure required • Uses topography. • Provides attractive use of space. • Uses rugged terrain.
Public Facility Uses	• Creates an overall good quality of life. • Creates jobs. • Allows services to be located in close proximity to residents. • Attracts other businesses.
Recreation	• Creates an overall good quality of life. • Provides attractive use of space. • Provides opportunity for family activities. • Uses topography.
Forest Land	• Uses topography. • Adds basic resource for value added products. • Provides attractive use of space. • Requires fewer infrastructure capabilities.

Source: E.L. Robinson, No Date.

Mingo County has taken advantage of post-mine land. The Mingo County Agricultural Site was initiated in 1995 as an experimental project/partnership with Crown Industries, Inc., West Virginia University Division of Agriculture and the West Virginia Department of Agriculture to determine whether or not agricultural and horticultural crops could be grown on a reclaimed mine site. It is currently operated by the Delbarton Regional Christian School as part of its agricultural curriculum and has created two jobs. Three jobs were created with an initial $500,000 investment in the Mingo County Fish Hatchery which uses waster from an abandoned

coal mine to grow and market cold water fish. The only 18-hole course in the Mingo, McDowell and Logan area, the Twisted Gun Golf Course was built on the former Low Gap mining site. The $2.3 million project was completed and opened in 2001. This 100 percent private sector investment was made possible by Premium Energy, Mingo-Logan Coal and Pocahontas Coal, and has provided 25 jobs to the coal community (MCRA, 2011).

Mercer County

In March 2003, Mercer County became one of the first counties to begin development on a Land Use Master Plan (LUMP) in response to Senate Bill #603 (E.L. Robinson, 2003). Although the Mercer County Land Use Plan lacks the specific details regarding future plans, they have outlined several important findings and standards for the developable land and will benefit from the southern half of the KCH; which will replace existing US 52 between Williamson and Bluefield, extending approximately 90 miles.

Infrastructure will be constructed on 5 percent of the post developable area in the initial phase. One hundred percent of post developable land will be configured and prepared as identified in the approved site plan. The WVDOH will play an active role in the creation of access roads and all roads must be designed and constructed per WVDOH standards. Water and wastewater systems will be designed and constructed in accordance with the West Virginia Bureau for Health standards. Utilities including but not limited to electric, gas and telephone on the sites are to remain in place.

Mercer County encourages individuality within the land use plan by coal companies. Instead of forcing the use of the land on companies, they will identify the proposed value when applying for a permit or modifying existing permits. The main goal of the committee and the Mercer County Commission is to provide the maximum possible benefits while enhancing the quality of life for the citizens of Mercer County (E.L. Robinson, 2003).

"Agritourism" is a key for the future economic growth and development of Mercer County. Agritourism is the practice of attracting travelers or visitors to areas used primarily for agricultural purposes, including farms, ranches, farmhouses, wineries and other country businesses open to the public. Several joint grants with West Virginia State University and other tourism-development entities exist in an attempt to develop a long range plan (Crossroads, 2007). A 2007 analysis was prepared for the possibility of an equestrian park in Mercer County, an attempt to provide both local residents and agritourists with an enjoyable recreational facility. Unfortunately, the proposed location was found to be a watershed so the plans could not progress any further.

McDowell & Wyoming County

Successful economic development in McDowell County is dependent on adequate infrastructure, and the County Commission and its cities are committed to infrastructure improvements. From 2004 to 2009, substantial expansions of roadways, bridges and drinking water were made

(WVOCCD, 2009). The primary prepared site in the I-73/74 study area is the Indian Ridge Industrial Park. Utilities such as sewer, electric and gas are installed in the park, with water lines soon to follow (WVKingcoal, n.d). Construction has been completed on the $224 million federal prison, bringing 360 full time jobs, with 78 percent of the workers hailing from southern West Virginia and paving the way for a hotel and a new housing development built on post-mine land (Ford, 2010). A portion of the 60 mile Coalfields Expressway will intersect with the I-73/74 corridor near the site of the new prison, allowing both McDowell and Wyoming Counties to capitalize on additional economic development opportunities. Upon completion, the Coalfields Expressway will run east-northeast from Grundy, VA to Beckley, West Virginia and connect to the West Virginia Turnpike.

McDowell and Wyoming Counties enlisted the assistance of Parsons Brinckerhoff Quade & Douglas (PB) to facilitate the creation of their Community Sustainability Evaluation in July 2003. The purpose of their study was to prioritize infrastructure consolidation, community relocation and public streamlining by using a number of environmental, socioeconomic, and infrastructure capabilities to measure community sustainability. They collected measurements to develop a matrix examining the economic health and prospects for continued short- and long-term investments, and ultimately evaluating the overall sustainability of the communities in Wyoming and McDowell Counties. PB defines sustainability as a community's ability to maintain services, withstand local and regional economic financial disruptions and meet the demands of natural growth, decline and change on a continuing basis. Measurements were selected to evaluate land suitability, infrastructure, demographics, general government finances, government utility funds, public service district finances and critical mass.

Land suitability measurements were selected in order to evaluate the suitability of land within existing jurisdictions to maintain services not affected by flooding. The measurements used included the percentage of developed land area within the incorporated jurisdiction within the 100-year floodplain and the percentage of land area within the incorporated jurisdiction within the 100-year floodplain.

An important aspect of any community is the ability of existing public infrastructure facilities to support safe and healthy communities. For this reason, PB chose available sanitary sewer systems, and the age of systems as a measurement for infrastructure. A surprising fact regarding McDowell and Wyoming Counties is that access to approved sanitary sewers is available in some but not all communities. The importance of a reliable sanitary system cannot be underestimated and future land use could involve the construction of such infrastructure.

In order to analyze demographics such as socioeconomic and housing factors a number of measurements were selected for the PB study. Overall the population decreased in both counties between 1980 and 2000. This was due to a declining and less stable economic base, a declining demand on infrastructure, fewer users to support utility maintenance needs, a shrinking tax base

and a decline in the need for schools. Median age was selected by PB as another measurement and the study found that McDowell and Wyoming Counties median ages were 40.5 and 40.1 compared to 38.9 for the state of West Virginia. An older median age can signify higher costs for transportation, health care and other services in addition to fixed incomes, which make it difficult for residents to contribute to the economic base of the community. To determine the number of households which are uninhabitable or undesirable, the percentage of vacant households and the percentage of home ownership were chosen as measurements. Homeownership is an important indicator for a community as low percentages reflect low household incomes, and the lack of ability to purchase a home. High rental rates show either a transient population or poor employment operations related to low levels of community stability. The report also examined the percentage of structures built in 1939 or earlier which can shed light on whether or not there are stable or declining populations, lack of new housing investments and higher levels of unsafe housing. The final demographic measurement used was the percentage of structures that are mobile homes showing the availability of safe housing or low levels of income.

A concern for many counties in West Virginia, particularly the smaller ones, such as McDowell and Wyoming, is the financial sustainability of the government. For this reason, PB elected to use measurements such as annual general fund surpluses or deficits, unreserved general fund balance, revenues from property taxes and business and occupational taxes, use of fund balance and identification of a reportable condition or material finding from an auditor. These measurements are able to show whether or not an imbalance between revenue and expenditures exists and insight into the use of revenue sources by a government.

Evaluating government utility funds and public service district finances is a feasible way of analyzing population trends by examining cash inflows as well as revenue structure. Using an annual operating surplus or deficit allows the counties to observe operating deficits and the potential effects in the future. The evaluation also included retained earnings as a percentage of total operating expenditures, cash from customers, cash and cash equivalents as a percentage of current liabilities, outstanding debt and depreciation expense as a percentage of current assets. The final measurement used was to evaluate the critical mass of the study area. Using the population in 2000, a study is able to determine whether or not the community is able to support infrastructure, public services and achieve financial stability.

Overall, both counties scored poorly on the individual measurements and all aspects of the evaluation. Out of the thirteen municipalities evaluated, only one was categorized as fiscally sustainable while the rest were marginal or unsustainable. Eleven municipal utility funds were evaluated with five being marginal and the rest unsustainable. Public service district measurements produced similar unfavorable results as only three were sustainable with the remaining being marginal or unsustainable. Based on the results of the study, five redevelopment alternatives were presented and are outlined below (PB, 2003):

Community Redevelopment Alternative 1

No alternative exists and the recommendation is to keep current trends and jurisdictions in the counties. A number of programs are in existence that would allow McDowell County residents and businesses to relocate out of flood areas; however, the lack of suitable relocation areas may increase population declines. No flood control programs exist in Wyoming County; however, implementation of flood control could be initiated. Other than Welch, jurisdictions in McDowell have marginal sustainability while Wyoming Co. is more sustainable. Both counties have a limited number of benefits available from potential transportation corridor improvements in addition to low public infrastructure investment options due to low population and distribution, and the lack of use of Senate Bill 603 opportunities.

Community Redevelopment Alternative 2

The second alternative suggests a consolidation of public service districts and jurisdictions in order to increase efficiency in McDowell County by consolidating into five service areas and maintaining the three existing jurisdictions in Wyoming County. Flood risk reduction measures should be taken in both McDowell and Wyoming counties, according to Corps Section 202 which authorize the Corps to design and construct flood control measures in order to prevent future flood damages. This alternative also takes limited transportation infrastructure improvements into consideration and calls for the maintenance of traditional population centers and settlement patterns coupled with lack of SB603 opportunities.

Community Redevelopment Alternative 3

Heightened by the opportunities stemming from the construction of the KCH, Coalfields Expressway and the potential of significant community impacts; alternative three calls for the consolidation or relocation of all McDowell County jurisdictions, except for Welch, into flood safe locations. These flood safe locations are adjacent to the Indian Ridge strip-mine sites. Section 202 guarantees redevelopment areas which would mitigate any potential population losses in McDowell County. Jurisdictions in Wyoming County are maintained. Proposed highway improvements and redevelopment provisions of Senate Bill 603 are key aspects of alternative three.

Community Redevelopment Alternative 4

Similar to alternative three, the fourth alternative takes full advantage of the KCH and Coalfields Expressway development and recommends the consolidation of McDowell County while maintaining Wyoming County jurisdictions. Additional relocation and development areas extend east to mining sites adjacent to the proposed Shawnee Highway. Additional population losses are prevented as the sites are fully supported by Section 202 in McDowell; a similar program is recommended for Wyoming. Proposed transportation improvements and redevelopment provisions of SB 603 are prevalent and equate to high efficiencies as well as significant impacts to community identity and cohesion.

Community Redevelopment Alternative 5

Alternative five relocates the population of McDowell County jurisdictions, including Welch, into redevelopment sites adjacent to Indian Ridge while a secondary service area is constructed adjacent to the Coalfields Expressway. Both redevelopment sites support relocated Section 202 participants keeping potential population losses at a minimum. While Wyoming County jurisdictions are maintained, Section 202 is recommended as well. Alternative five also boasts high leveraging of proposed highway improvements and the redevelopment provisions of Senate Bill 603 with significant impacts to the community.

The Indian Ridge Industrial Park plays a key role in further development in McDowell and Wyoming Counties. Proper planning and coordination of the reclaimed land surrounding the park can provide substantial opportunities to these economically depressed counties. The Indian Ridge Industrial Park could not have come to fruition without the cooperation between various state agencies and local, state and federal officials. The partnership of the OCCD and the Brownfields Assistance Centers at Marshall University and West Virginia University provides opportunities for further development. County development officials will be able to use the expertise of multiple groups to assist in land use master planning and evaluation of uses for individual surface mines (Wood, n.d.).

The Huntington District, US Army Corps of Engineers completed an Upper Guyandotte River Basin Study in March 2010. The Upper Guyandotte watershed covers over 580 square miles and includes portions of both eastern Wyoming and southern Raleigh Counties. The primary study area included Wyoming County, specifically the cities of Mullens, Pineville and Oceana. Unfortunately, the area has been the subject of at least 10 federal disaster area declarations since 1996; the long history of flooding has relocated businesses and residents while leaving little land to be developed.

I-73/74, Coalfields Expressway and Shawnee Highway will all three affect the basin as the I-73/74 and Shawnee will run on the outskirts. However, the Coalfields Expressway is planned to bisect the basin, particularly close to Mullins and Pineville, and opportunity lies not only for economic growth but also for useful land based on highway right of way. As long as the land is available, "creeping relocation" offers the opportunity for development of new businesses and access routes along the highway, in addition to providing attractive sites for new residential areas. Due to the close proximity of the highway, these sites will most likely be on high ground and will substantially reduce the impacts from flooding damages (USACE, 2010).

Wayne County

Wayne County possesses several advantages, including the amount of developable land available and the commitment to continuous improvement of utilities and infrastructure. Wayne County has access to highways, such as Interstate 64 and the TOLSIA Highway, the northern half of a proposed project to replace existing West Virginia Route 52 between Huntington and Bluefield,

extending 58 miles from Huntington on the Ohio River south-southeast to Williamson. The Wayne County PMLUMP planning process consisted of several steps including data collection, site analysis and future land use selection. Site analysis was completed using the following criteria for each location:

- Distance to the nearest roadway by type.
- Distance to the nearest airport.
- Rail access.
- Access to utilities: electric, gas, water, wastewater, sewer.
- Existing environmental issues/constraints.

After data was collected, potential future land use categories were applied to each identified surface mine site throughout the county. Instead of imposing specific uses of the land at particular sites, the county allowed individuality within the land use plan and offered a range of uses that may be considered (E.L. Robinson, 2004).

Table 6-3 Wayne County Future Land Uses

Land Distribution	Future Land Uses
0 to 1 mile	Industrial, Commercial/Retail, Residential, Public Facility, Recreation
1 to 2 miles	Industrial, Commercial/Retail, Residential, Public Facility
2 to 3 miles	Industrial, Commercial/Retail, Residential, Recreation
3 to 5 miles	Industrial, Residential, Recreation, Agricultural, Forest Land
5 miles and beyond	Industrial, Agricultural, Forest Land, Residential

Source: E.L Robinson, 2004.

The PMLUMP also provides for a set of standards to be used for the developable land and is similar to those established for other counties in our study. Infrastructure will be constructed on 5 percent of the post developable land in the initial phase. One hundred percent of post developable land will be configured and prepared to achieve post mining land use identified in the approved site plan. Access roads will be designated and constructed per WVDOH standards. Water and wastewater systems will be designated and constructed per West Virginia Bureau for Health Standards. Electric, gas, telephone and other utilities on the site are to remain in place as shown in the approved plan (E.L. Robinson, 2004).

Wayne County realizes that without combining their efforts and establishing clear communication with entities such as the OCCD, the County Planning Committee and the Economic Development Authority, achieving maximum potential from post-mine land will be a difficult task.

The mountainous terrain of West Virginia puts the state at a disadvantage because of the lack of usable land with utility and transportation availability. Surface mining combined with post mine land use and proper planning will allow the state to realize its potential. By creating flat land

with access to utilities and transportation, a wide variety of infrastructure can be created that benefits the state and its residents. An emphasis was placed on PMLU when Senate Bills 603 and 1011 were passed. Although all counties with surface mined properties are required to have a PMLUMP, many opportunities exist for assistance and direction from state officials, including the Governor's PMLU Task Force.

The state's tourism and recreational activities can benefit immensely from PMLU, and the state has created a number of incentives to the business owner, particularly tourism businesses that use surface mined areas. The West Virginia Tourism Development Act of 2005 provides a number of incentives to promote economic development in the state. By offering a substantial tax credit to projects located on or adjacent to surface mined areas, the state has once again shown its commitment to use post-mine land in a manner that provides the most benefits.

Mingo, Mercer, McDowell, Wyoming and Wayne Counties are directly involved in the creation of the KCH, making their PMLUMPs important. The opportunity to foster economic growth and development is tremendous and a plan with clear direction and goals must be established as not to miss out on this opportunity. Facing a steady decrease in the mining industry, Mingo County has suffered a decrease in population, as well as students and teachers in the community. Mingo County recognizes the importance of successful PMLU and has had the most experience and success in the implementation of these projects, including but not limited to the Twisted Gun Golf Course and the Hatfield-McCoy Trails. Even more success is on the horizon as future plans for PMLU include a coal-to-liquids plant, air transportation park, a 4H Youth Camp and the growth of the Hatfield-McCoy trail system.

The southern half of the KCH will extend approximately 90 miles to Bluefield, located in Mercer County. Mercer County's PMLUMP allows individuality for land use by the coal companies as long as the project provides the maximum possible benefit to the citizens while enhancing the quality of life in the area. Agritourism, the practice of attracting travelers or visitors to areas used primarily for agricultural purposes, is a key for future growth and development. Although the 2007 plans to build an equine/multi-use facility between Princeton and Bluefield were ultimately scrapped due to the location being in a watershed, construction of the KCH in Mercer County could provide flat, useable land with access to utilities for a new attempt. This would greatly enhance the area and bring much needed economic growth to Mercer County.

McDowell and Wyoming Counties historically known for their coal production and have suffered due to the decline of the coal industry. Each county presents a particular problem as the majority of the area is located in an area prone to severe flooding. A number of alternatives are available for these counties, involving usage of the Indian Ridge area and land made available due to the construction of the KCH. The completion of the $224 million dollar federal prison in McDowell County has already provided a number of benefits. Among them are jobs for

southern West Virginia residents and a serious discussion regarding hotels, restaurants and a housing development, all of which will be built on former surface mines.

Although Wayne County residents rank below the state average in terms of income, their population is expected to grow and local officials are committed to using the amount of available land to their advantage. With such a close proximity to Interstate 64 and the Tolsia Highway portion of the KCH, a great deal of opportunity lies in this area of West Virginia. Setting standards and criteria for post-mine land use, Wayne County is poised to take full advantage of land made available from surface mining, as well as the traffic generated by having well-traveled roadways running through the area. They realize the need for industrial, commercial/retail, residential, public facility and recreation areas in order to improve the economic condition of Wayne County.

Senate Bills 603 and 1011, along with the West Virginia Tourism Act and the Governor's commitment to PMLU, are vital for the economic future of West Virginia. Surface mining not only brings money to our state through taxes, but the opportunity to develop post-mine land is paramount. It is imperative that PMLU plans include the creation of utilities and have a feasible form of transportation as it does the state no good to have parcels of land available for development but lacking the means to achieve the maximum potential.

Additional/Revised Legislation

Realizing a need for new construction and improved transportation facilities that would be compatible with state and local transportation plans, the state passed HB 4476 in 2008. However, no additional legislation has been passed since. Through the passage of HB 4476, the state emphasized a commitment to better the public health, safety, convenience and welfare as well as enhancing residential, agricultural, recreational, economic, commercial and industrial opportunities in West Virginia.

Possible Incentives

Since the KCH initiative has such an innovative and unique funding method, it is difficult to relate it to other P3s. Its unconventional nature makes it the only example of such a partnership. However, certain incentives such as liability limitations, tax credits, reductions on severance taxes, property tax exemptions and tax-exempt bonding mechanisms are all potential approaches that can be taken to initiate the joint venture with the coal producers.

Sustainable Tourism and Recreation Development

The 2005 West Virginia Tourism Development Act[5] provides an incentive that stimulates the creation of new destinations and the expansion of existing ones that promote economic development while preserving the region's distinctive heritage. A feasibility study of the project concept for alternative land use must accompany the comprehensive application. Approved project applications can recover up to 25 percent of the approved development costs over a 10-year period through consumer sales and service tax credits at a rate of one tenth of the amount per taxable year. Approved projects located within the permit area or an adjacent area of a surface mining operation can recover up to 35 percent. The criteria that must be met for a project application to be processed and evaluated are as follows:

- Attract at least 25 percent of its annual visitors from outside the state.
- Have approved costs in excess of $1 million.
- Have a significant and positive economic impact on the state.
- Produce sufficient revenues and public demand to be operating and open to the public for a minimum of 100 days per year.
- Provide additional employment opportunities in the state.

Liability Limitations

In order for the coal companies to establish a P3 with the West Virginia Department of Transportation (WVDOT), certain terms and conditions must be set, both contractually and legislatively to ensure that there is limitation of liabilities for the coal producers. This would generally be considered an agreement that limits the liability of the mining company for losses and damages once the rough section of roadbed is accepted by the WVDOT. Limitation of liability clauses can provide protection against future claims should defects be found at a later date or in the case of partial roadbed failure. The limitations can also be effective in allocating project risk to certain parties.

In this case, the client would be the government and the developer would be the mining company that builds the roadbed. The general idea in the P3 arrangement is to transfer risk to those who can manage certain aspects and consequences of a project more effectively. For instance, the private sector may be most effective in handling issues of construction, operation and maintenance costs while the public sector may deal with managing public liability and granting permits (Kane, 2005). In this case, the mining company would be accepting less risk than the developer because they are simply engaging in one specific aspect of construction. Financially, beyond the tax incentives that will likely accompany their participation, there is no vested interest and serious financial risk in the project for the mining companies after completion of the

[5] *Tourism Destination Development*, WV Department of Commerce. http://www.wvcommerce.org/App_Media/Assets/publications/businessworkforce/TourismDestinationDevelopInsertCover.pdf

roadbed. The WVDOT will be handling other aspects of the project, and will be managing the financial and policy concerns for the project in the long run. However, there still needs to be some degree of liability for the coal producers to ensure that they construct the roadbed correctly and safely. These shared risks need to be understood within the terms of the contract. Liability limitation is an effective way to create incentives for coal producers to participate, as it grants assurance that accountability exists only for the tasks carried out under the agreement.

Hatfield-McCoy Trail Case

The development of the Hatfield-McCoy trail system in 1996, and the cooperative agreement between private landowners and state authorities that resulted, offers a perfect example of how P3s can work through limiting liability. This trail system offers extensive opportunities for ATV enthusiasts to utilize 2,000 miles of trails with appropriate facilities, amenities and outfitters in various counties throughout southern West Virginia. However, a large portion of the land utilized is private property. A P3 was established between state authorities and private owners which operated as the medium to facilitate the terms and conditions of the agreement. Besides garnering the benefits of reduction in tax burdens and enhanced property values, the private owners were also provided with exemptions from liability for accidents or damages incurred on their property during its use for recreational purposes (Center for Business and Economic Research, 2006).

In §20-14-5 of the West Virginia State Code, the legislature identifies and establishes the state's powers of authority to carry out various acts concerning the trail system. In the 29th subset of section five of this article, the legislature claims their right to engage with landowners and all other applicable parties and exempt them from claims against them with regards to use of their land in public recreation activities. Specifically, it says that the state can "enter into contract with landowners and other persons holding an interest in the land being used for its recreational facilities to hold those landowners and other persons harmless with respect to any claim in tort growing out of the use of the land for public recreation or growing out of the recreational activities operated or managed by the authority" (W.V. code §20-14-5). This aspect was vital for ensuring that private landowners allowed these recreational activities to occur on their land. Had it not been for this agreement, it is uncertain whether the trail system would even exist.

The construction of the roadbed will play a prominent part in jumpstarting the highway construction process. However, their role ends when the roadbed is constructed. The coal company's accountability should only stretch as far as following procedures, standards and accomplishing the task for which they are contracted. Therefore, in the same way that the state and trail authorities accepted responsibility for the trail systems once it was agreed that the land could be used, the WVDOT will accept its oversight role for the highway as it will own the right-of-way. However, the West Virginia legislature needs to create a law applicable to the KCH where it stipulates that any damages or accidents incurred on the roadway following its construction cannot be claimed against the coal producers.

Tax Credits

Another effective way to incentivize the coal companies to partner with the WVDOT is to offer various incentives with regards to taxation policy. The West Virginia Corporate Tax structure is characterized by a flat rate of 8.5 percent tax on all corporate income. Nationally, the state is ranked 11th highest in terms of its rate of Corporate Net Income Tax, and, in 2008, the corporate tax collections on a state level were $297 per capita (The Tax Foundation, 2010). Without directly paying the mining authorities for the construction of the roadbed, the state can induce them with guarantees of relieved tax burdens through methods like tax credits and other means.

New Market Tax Credits

It may not be necessary that the state forego any lost tax revenue due to issuing tax credits for this project. Nationally, tax credits are being used as a way to help fund and spur economic development in communities and underdeveloped economic regions. These credits not only offer a way to generate funds for development and encourage economic growth in distressed areas, but they also help relieve contributors of the heavy burdens of high corporate income taxes. In the New Market Tax Credit program, taxpayers are given a tax credit for making qualified equity investments in Community Development Entities (CDEs). A CDE may issue bonds, and then loan the proceeds of the bonds to private entities in an effort to foster economic development within a region. Since the construction project is located in a designated low income census area, investors are eligible to receive a tax credit of up to 39 percent. (Economic Development Corporation of Utah, 2010).

The first necessary step is to create a Community Development Entity (CDE) for the project. According to the U.S. Treasury Department, a CDE is a "domestic corporation or partnership that is an intermediary vehicle for the provision of loans, investments, or financial counseling in Low-Income Communities (LICs)." Eligible community agencies apply to the U.S. treasury Department for approval of CDE status and therefore the ability to issue New Market Tax Credits. Their eligibility is based on a project's status as a legal entity, having a mission of serving low-income communities and maintaining accountability for the LIC.

Upon certification, the CDE's are eligible to allocate the tax credits to investors who make equity investments in the CDE. The investors can be individuals, companies or organizations and can include entities like banks and thrifts, insurance companies, investment banks, finance companies and corporations. These equity investments, in turn, provide the capital needed for making loans or investments to businesses interested in development in the area. For businesses to be eligible recipients of loans from the CDE, they must meet five criteria (United States Treasury Department, 2001):

1. They should be located in a census area where the poverty rate is either greater than 20 percent or within an area where the median income does not exceed 80 percent of the statewide median income.

2. At least 50 percent of the business's income must be derived from activities in a low-income community.
3. A substantial proportion of the business's property must be located in a low-income community.
4. The employees of the business must perform a considerable proportion of their work in the LIC.
5. Less than 5 percent of the business's assets can be held in unrelated investments.

In West Virginia, various CDEs are already set up around the state, in areas like Charleston, Huntington, Parkersburg, Barboursville, Wheeling, Shepherdstown and other cities (United States Treasury Department, 2010). However, it may be necessary to establish a separate entity dedicated solely to the interest of the KCH and economic development in southern West Virginia. Government authorities can be certified as a CDE as long as they are considered to be a corporation or partnership for federal tax purposes (United States Treasury Department, 2005). In this instance, it may be necessary for government involvement in establishing a CDE as it will make the facilitation of the tax credits easier and more assuring for the coal companies. The West Virginia Community Development Loan Fund in Barboursville, for instance, is a subsidiary of a local bank in the Huntington-Barboursville area. Loans issued to businesses are still expected to be repaid with a percent of interest added to the loan. Facilitating the arrangement with a CDE set up by the Department of Highways would be beneficial as the interest on the loan would be minimized.

Why use NMTCs?

An advantage of using the NMTC program structure as a potential medium for offering tax credits to the coal companies is that they are federally funded credits and the state would not be bearing any opportunity cost due to foregone tax revenue. Credits are allocated from the federal government; the credits would cover federal taxes, not state taxes. If tax credits were issued on a state level, there would be a need for authorization by state legislation. This may make it difficult for total approval of potential state credits since the issue of coal in the region is typically contentious. The highway project may not be seen as a priority for members of the state legislature; they may view the credits solely in terms of loss tax revenue rather than benefits for the state and economic development in distressed regions. It is advantageous to seek ways to utilize tax credits through already established means.

The current structure of the NMTCs is not set up for tax credits to go to the companies or businesses operating in the economically depressed areas but for the investors who provide the equity to the CDEs. Investors can claim a 5 percent credit on the investment amount the first 3 years, and for the following four years they can claim a credit of 6 percent. Over the life of the investment, the investor is expected to earn over 30 and up to 39 percent of the credit, in present value terms (United States Treasury Department, 2005).

A NMTC Example in West Virginia

Many investors, businesses, and public authorities have already taken advantage of utilizing these tax credits since the program was initiated. In West Virginia, a relevant example stands out in the town of Pineville. Pineville is a small town in the state with a population of 700. The town had been historically linked with the coal industry until the 1980s and the 1990s brought on greater advances in coal mining technology forcing a shutdown of the mines. These shutdowns left the area economically depressed with high poverty rates and high levels of unemployment.

In the early 2000s, an existing coal company approached First State Bank of Hurricane with the prospect of developing a new mine in Pineville. The coal company's proposal for a loan was met by hesitation from the bank. However, with the initiation of the New Market Tax Credit (NMTC) program, the project in Pineville was able to move forward. The First State Bank created a subsidiary called the West Virginia Development Loan Fund which would be certified as a CDE and granted $4 million in New Market Tax Credits. They were subsequently able to loan the mining company approximately $1.2 million, which was used to finance the equipment used in the preliminary stages of the project. This loan helped fill the financing gap for the project, and the company would fund the other $2.5 million directly.

Opened in 2004, the site has become a resounding success for the company. The company has netted greater profits than were initially expected, and they created nearly 50 well-paying jobs in an economically distressed area. The NMTC program granted the bank an opportunity to invest in an area they would not have otherwise invested in without the CDE. It also enabled the West Virginia Development Loan Fund to lend at a lower interest and accept collateral that would have otherwise been too risky. This example offers insight into the prospect of using the NMTC program in partnership with coal companies. Mining authorities are obviously eligible recipients of CDE loans in West Virginia since a precedent has already been established (Rapoza Assoiciates, 2005).

New Market Tax Credits and Financing the King Coal Highway

In order to utilize the existing and required procedures, mining companies could set up some form of financial subsidiary which would contribute equity to a CDE for an amount that would be substantially greater than the additional costs of building the roadbed. The CDE would, in turn, lend the same money back to the coal company in the form of a business loan. The mining company chosen should be an eligible recipient of funds from the CDE as they will be basing their operations and earnings in an area of West Virginia considered economically distressed. From there, the roadbed should be built using the funds provided by the CDE.

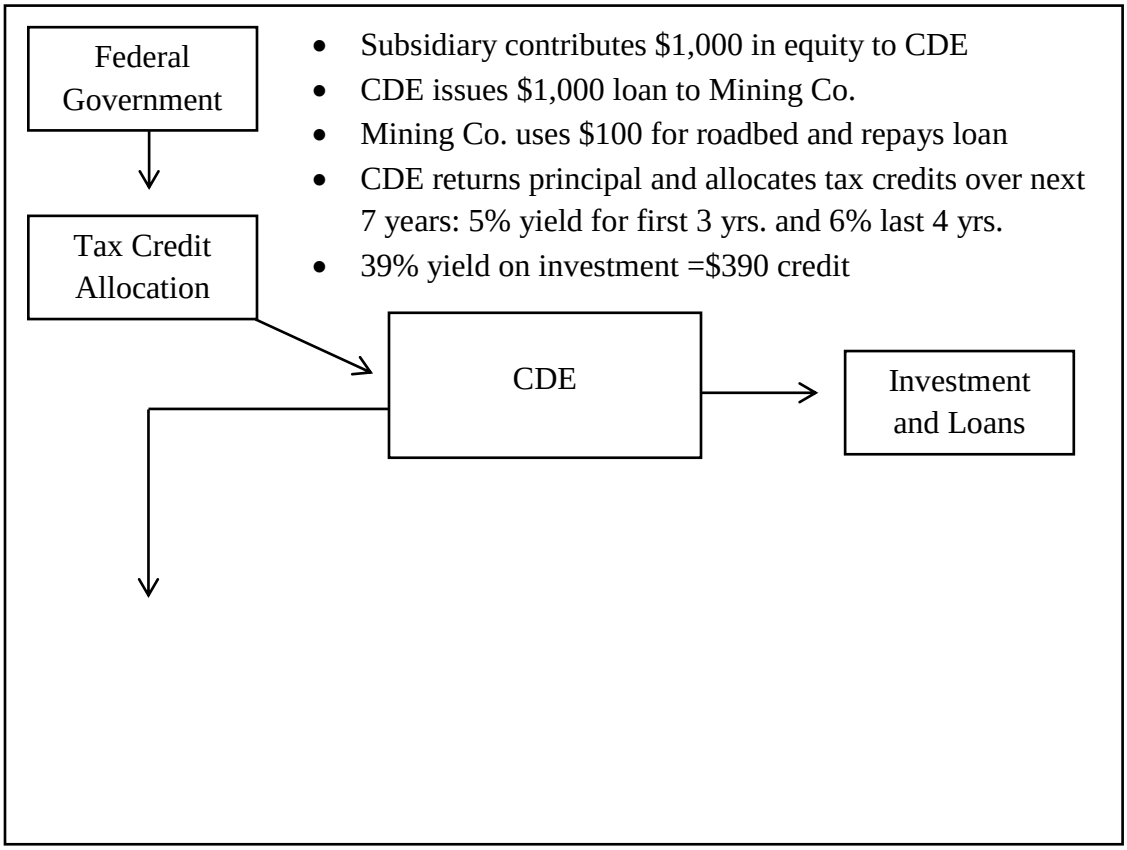
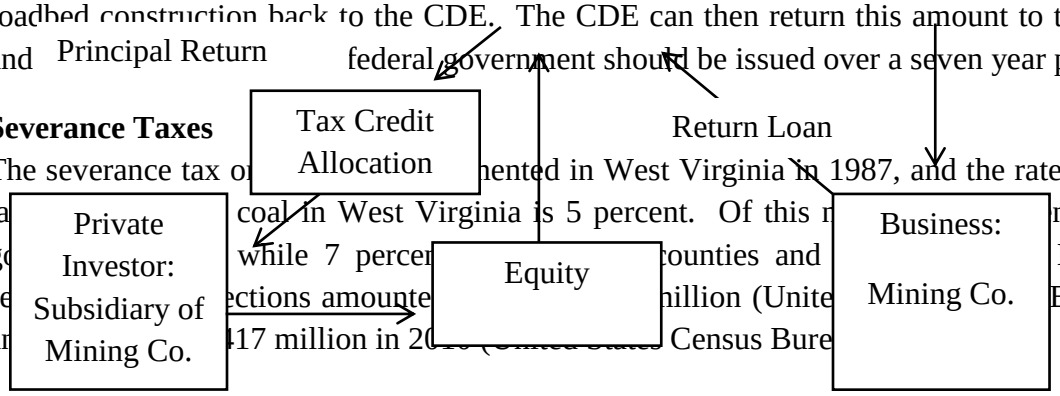


Figure 6-1 New Market Tax Credit Overview & Example

Although these funds actually originate from the mining company's subsidiary, they would simply be repaying the mining company. They will fund the construction of the roadbed in a similar manner as if they were funding the reclamation of the land. However, the difference is that, over the seven year period of equity investment, they will receive additional tax credits that should exceed the amount representative of the initial investment cost. The subsidiary initially lent more than the cost of building the roadbed as they will reclaim the tax credits in the form of 30 or more percent. Therefore, in order to offset the costs of building the roadbed, and produce revenue by performing the service, it is necessary to invest at least an additional 3 to 4 times the construction cost. Subsequently, the mining company can repay the money borrowed for the roadbed construction back to the CDE. The CDE can then return this amount to the subsidiary and federal government should be issued over a seven year period.



Severance Taxes

The severance tax o[illegible]mented in West Virginia in 1987, and the rate of severance ta[illegible] coal in West Virginia is 5 percent. Of this r[illegible]nt of the total g[illegible] while 7 percen[illegible]counties and [illegible] In 2009 total se[illegible]ections amounte[illegible]illion (Unite[illegible] Bureau, 2010) a[illegible]417 million in 20[illegible] Census Bure[illegible]

Although a severance tax is traditionally levied on nearly all forms of production of resources taken from land or water bottoms within the territorial boundaries of a state, there can be exceptions and exemptions for these taxes. For instance, the public sector in various states can offer inducements to firms for engaging in the production and extraction of natural resources. The notion has been that the firm's presence created jobs, fostered economic development in the region and stimulated exploration and field development. In general, it is believed that establishing firms from these industries creates a public benefit for the surrounding area. (Technology Assessment Division, 2009).

For instance, Louisiana law provides abatements for severance taxes on oil and natural gas extraction under similar rationale. Although the state looks to benefit from the advantages of development, the agenda for incentivizing through severance tax reductions also serves an environmental purpose that creates a public benefit. Producers of oil and gas are eligible for savings on severance taxes if they inject produced water into oil and gas reservoirs in Louisiana. This is done in an effort to increase the recovery of hydrocarbons and reduce the discharge of produced water. A reduction of the severance tax of 20 percent is offered to firms engaged in this practice, and both parties involved benefit from this arrangement (Technology Assessment Division, 2009). Due to cost savings, the production companies have minimized their financial burden and the government provides a solution that diminishes environmental damage to citizens while encouraging economic development in the state.

Severance Tax Incentives for West Virginia

A similar situation exists in West Virginia with the KCH. The state is looking to provide a public benefit to users with the least amount of cost to the taxpayer. Engaging in a P3 with mining companies is one way project completion can be achieved more efficiently and guarantees that benefits are provided to both parties involved. The mining firms may receive greater profits due to the savings they can potentially realize in severance taxes. At the same time, the state and other local entities are being offered benefits in terms of economic development, job growth, greater long-term tax revenue streams and better transportation offerings to the public.

The concept of offering incentives to industries in the form of severance tax reduction is already practiced within our state. For example, the timber severance tax in West Virginia, which is calculated as a percentage of the gross timber severed in the state, accounts for revenues that benefit the state and the Division of Forestry. However, the state still offers reduction of these taxes should the harvester cut timber that will eventually be used in the processing of wood products such as beams, cabinets, tables, pressure, related lumber railroad ties, posts and deck boards. The general idea is that the processing of wood into these materials increases the economic value of the inputs and lead to economic expansion in the state. As the wood changes in structure, from a standing tree into a processed product, there is value added and the wood

products can be sold for higher prices. The end goal of the legislation to offer the severance tax reductions was to encourage wood processing development in the state (Fischer, 2002).

Although it may be different to compare the incentives for taxation reduction in the timber industry with the coal industry, the motivations and reasoning behind the two cases are similar. For instance, the short-term goals in utilizing the coal industry as a private entity in the KCH project are to improve efficiency, achieve cost reductions and open southern West Virginia to economic growth. However, the long term benefits that are achieved through the eventual development of the highway network will be substantial. Sustained economic development, greater levels of employment, increased safety, and travel time savings are expected as a result of the KCH (Chmura Analytics and Economics, 2007).

Similar to the legislation regarding the timber industry encouraging economic development within the wood processing sector, a policy that provides severance tax incentives for the coal industry would encourage the involvement in the P3, thus expediting the highway construction. The coal industry is technically performing a value-added service in that they are developing the land into a structure, the roadbed, which has greater value than it would be if it were simply reclaimed in the traditional manner. It is understandable how a possible severance tax reduction for the coal extracted from the roadbed would be positive motivation for not only the mining companies, but also the public entities involved. The state would need to undertake a comparable legislative initiative to allow for severance tax reductions under these circumstances. A percentage of the tax could be reduced or total exemption could be made for reserves that previously lied under the roadbed but were extracted to allow for roadbed construction.

Reclamation fees in the KCH Case

Another point to note in this context is the reclamation fee that is normally imposed on producers of coal in West Virginia. Typically, producers are assessed a fee following the mining process in an effort to reclaim the land from surface mining and cover the costs of forfeited mining sites. In West Virginia, there is a "Special Reclamation Tax" which is imposed at $0.144 per ton of cleaned coal that is mined. There is also a permitting fee of $1,000 associated with the reclamation process, and a penal bond between $1,000 and $5,000 per acre with a maximum of $10,000 that is due to insure the proper reclamation of the land (Kent and Eastham, 2011). These fees are imposed in addition to the federally regulated fees for reclamation mandated by the Surface Mining Control and Reclamation Act of 1977.

Although the mining producers may not be able to avoid fees imposed on a national level, the state may be able to offer an additional incentive to the producers by waiving reclamation related fees. First, it should be determined whether the roadbed construction would even be considered as a form of reclamation. If it is deemed that constructing the roadbed is indeed a form of reclaiming the land, the option of waving permitting fees and reclamation taxes should be considered as another incentive to offer the mining authorities. The penal bond, however, may

still be a relevant way to insure the roadbed is constructed properly. The mining authorities will be held accountable for proper construction through payment of a penal bond covering the area of the roadbed. When the roadbed is complete, the bond repayment would be made in the same way it would have been after a reclamation process.

Property Tax Exemptions and Tax Increment Financing

Private enterprises who engage in agreements with public entities often require local incentive commitments from the state or community where the enterprise will be located. These local incentives often come in the form of tax increment financing (TIF). TIF uses the future increases in property tax revenues to finance current infrastructure investments. These districts are managed by local government officials or other public entities such as a Community Development and Renewal Agency (CDAs). Tax increments are the main source of revenue for CDAs. As a public agency, CDAs can create a project area and then collect certain property tax increment revenues to be used for economic development in the area. The idea behind TIF is that the infrastructure investments will increase the value of existing property within the district as well as encourage new development that expands the tax base.

Subsequently, private investors are willing to provide the initial capital for these investments because the debt service will be repaid through the increase in future property tax revenues. An example would be the increase in value of a portion of property because of investment made by a private entity. A piece of land may have an initial low property value due to its condition; and if an investor takes significant strides in improving the land, the value will obviously rise. This new value is known as the tax increment. This can be used as an incentive for financing to a private enterprise because the developer can potentially obtain a portion of the increase because of the economic benefits that their investment created. TIF does not increase the property tax rate in the district; rather, it dedicates a portion of future growth in the district's property tax revenues due to an expanded tax base for a specified time period (usually 20 to 25 years) to meet the debt service payments for the infrastructure investment (AECOM, 2007).

This type of arrangement was developed for the construction of the Conroy Road Bridge located west of Orlando, Florida. The bridge and ramps provide access to property on the eastern side of Interstate 4 which contains a high-end shopping complex and other retail and office commercial development. In order for the site to be accessible and prosperous, a partnership between the city of Orlando, Orange County, the Florida DOT and the Millenia development group was needed. The Orange County municipal authorities and the City of Orlando cooperatively formed a Community Redevelopment Authority (CRA) that served as a vehicle for issuing tax-exempt bonds for the project. This arrangement enabled both the county and city to collect tax proceeds for the new site. The Florida DOT provided an upfront loan of $5 million to get started and managed the design and construction of the Conroy project. The Millennia development group financed a majority of the infrastructure improvement costs on the condition that they receive property tax exemptions in the future. This would be financed through the tax increments gained

from economic development. This performance-based approach linked the payment of the transportation infrastructure development to the economic performance that should characterize the site subsequently. Even though the city and county gave up their portion of the increased tax revenue for a specific time, it must be taken into consideration that without the P3, development may have never occurred. Over time, the debt service will be paid off in full and the public entities will reap the full benefits of the property tax proceeds. Also, the state, county and city all reap benefits from the sales taxes and income taxes that are collected as a result of the commercial development (AECOM, 2007).

TIF Process in West Virginia

The TIF process became possible in West Virginia after the passage of amendment one to the West Virginia constitution in 2002. This amendment was implemented by the West Virginia Tax Increment Financing Act, which was ratified by the West Virginia legislature during the 2002 session (WVDO, 2003). In order to be eligible for TIF, a project must offer a substantial benefit to the area in which it will take place. In general, it should promote economic development by eliminating a blighted area, preventing an area from becoming distressed, increase employment, encouraging the location of commercial or industrial activity and jobs in West Virginia. In fact, the West Virginia Development Office notes that improving access to an area by building a road is a good example of a potential project. TIF projects can be proposed by various entities such as private developers, government entities and development authorities, but each project must be approved by a county commission or by a municipal governing body. TIF can only be used for projects within a development or redevelopment project area or district. A development project area or district is a discrete, contiguous geographic area that has not previously been developed or is underdeveloped. This type of area can only be classified as underdeveloped for a period of thirty years (WVDO, 2003). The eligibility of using the KCH location as a possible source for TIF can be plausible as the project area in southern West Virginia is widely considered to be an underdeveloped geographic region in the state.

TIF and the King Coal Highway

In the case of partnering with the mining companies under this type of agreement, the municipalities and the state could simply dedicate a portion of the additional tax revenue garnered from new businesses and services along the KCH as a source of property tax exemption for the mining companies. The idea behind these exemptions would be that the coal company would provide upfront costs of building the roadbed; in exchange, those costs plus potentially additional fees would be earned through exempting property taxes on coal in the highway or county area for a specific length of time. The state and municipal entities would be able to offer such exemptions due to the expanded tax base that would result from economic development in the area (DMJM Harris, 2007). Similar to the Conroy project, local and state authorities will not benefit initially from the increases in property tax proceeds. However, the KCH's construction and its subsequent influence on economic development will not take place if these initial measures to fund the foundation are not taken. In the future, all benefits of additional revenue

will be garnered once the repayment costs and additional incentive costs are paid off through the tax increments.

Financing Programs and Options

A P3 cannot benefit from operating revenue during the construction phase, so raising the necessary funds before the project begins is paramount. A challenge exists in attracting large scale investments for potential projects (PECC, 2006). A P3 that involves surface mining presents a different situation as not only is funding required to complete the construction of a project, but bonds must be submitted in order to guarantee proper reclamation efforts will be completed.

A number of innovative programs and finance mechanisms have been created that can assist in facilitating and supporting P3s. Federal fund management programs, credit assistance and various forms of debt/financing mechanisms can reduce the costs for a private entity to finance a project, and encourage participation. Many of the programs and financing options that are available could prove to be beneficial to the future of the KCH.

Table 6-4 Innovative P3 Financing Options

P3 Funding Options	Examples
Federal-Aid Fund Management	• Advance Construction and Partial Conversion of Advance Construction • Federal-Aid Matching (Flexible Match, Tapered Match, Toll Credits/Soft Match, Program Match, Third Party Donations)
Federal Debt Financing Tools	• Grant Anticipation Revenue Vehicles • Private Activity Bonds
Federal Credit Assistance Tools	• Transportation Infrastructure Finance and Innovation Act • State Infrastructure Banks • Section 129 Loans
Public-Private Finance Mechanisms	• Pass-Through Tolls/Shadow Tolling • Availability Payments
Other Financing Mechanisms	• Non-Federal Bonding and Debt Instruments

Source: Rall et al., 2010

Fund Management

Advance Construction and Partial Conversion of Advance Construction

As long as a project is included in a state's transportation improvement plan, advance construction is an option to be considered. Advance construction (AC) allows states to begin a project, even in the absence of federal aid obligation authority to cover the Federal share of project costs. A state can undertake a greater number of concurrent projects and AC helps facilitate construction of large projects while maintaining obligational authority for smaller ones.

Another substantial benefit to the use of AC is that states are able to maintain flexibility in their transportation funding program.

Partial conversion of advance construction (PCAC) is a process where the state converts, obligates and receives reimbursement for only a portion of the Federal share of project costs. The use of PCAC removes the requirements of waiting until the full amount of obligation authority is available. Using PCAC, a state is able to convert a project to Federal-aid project in stages based on required capital and the availability of obligational authority (FHWA, 2011e).

Federal-Aid Matching

The federal government offers a number of matching programs that allow for a variety of public and private contributions to be counted toward the non-federal match for federal-aid projects. Transportation enhancement projects allow funds from other Federal agencies to be counted towards the non-federal share of transportation enhancement projects.

Tapered match is a form of federal-aid matching that allows a project's Federal share to vary from year to year as long as the final contribution of Federal funds does not exceed the project's maximum authorized share. Tapering states can fully advance projects before securing bond and capital market financing. It is also of use when the project sponsor lacks the funds needed to match a federal-aid project at the beginning but will accumulate the match over the life of the project (FHWA, 2011c).

Special Experimental Projects (SEP-15)

The Federal Highway Administration (FHWA) has established a new experimental process to identify and evaluate potential P3s for project delivery. By establishing the Special Experimental Projects (SEP-15) program, the FHWA recognized that procedures should not be so narrowly construed that they hinder a possible project or program where innovation opportunities may exist. SEP-15 places emphasis on contracting, compliance with environmental requirements, right-of-way acquisition and project finance although other aspects of project delivery are also considered. An eligible SEP-15 projects will increase project delivery flexibility, encourage innovation, improve timely project construction and promote P3. The state must demonstrate that the experimental feature of the project will advance the goals of the SEP-15 (FHWA, 2011b).

Private Activity Bonds (PABs)

Section 11143 of Title XI of SAFETEA-LU adds highway and freight transfer facilities to the types of privately developed and operated projects. This provides for private activity bonds that may be issued which allow private activity on these projects while maintaining the tax-exempt status of the bonds. Section 11143 is proof of the federal government's desire to increase private sector investment in transportation infrastructure. As of March 2011, the U.S. DOT has approved over $4.4 billion in private activity bonds and issued $2.1 billion. Qualified projects

include any surface transportation project that receives federal assistance under Title 23, United States Code. Also included are projects for international bridges, tunnels or any facility for the transfer of freight from truck to rail or rail to truck (FHWA, 2011a).

Surface mining has been and continues to be a controversial form of mining; the controversy extends to other aspects of the process. Over the past several years, many banks are ending their financing of surface mining projects. In August of 2010, Wells Fargo eluded to the "considerable attention and controversy" surrounding mountain top removal mining and that their involvement with mining companies was "limited and declining." Although Wells Fargo only represented about $78 million in bonds and loan financing, other banks are following the trend of ending or cutting back on lending to mining companies (Zeller, 2010). The Pittsburgh based PNC Bank announced that it would cease to finance surface mining projects in November of 2010 (WYMT, 2010). The lack of support from the financial sector based on environmental views will make it increasingly difficult for coal companies to obtain bonding and financing.

Transportation Infrastructure Finance and Innovation Act (TIFIA)

The Transportation Infrastructure Finance and Innovation Act (TIFIA) program was designed to provide credit assistance for qualified projects of regional and national significance by filling market gaps and leverage substantial private co-investment by providing supplemental and subordinate capital. This includes large-scale surface transportation projects such as highway, transit, railroad, intermodal freight and port access. Eligible applicants include state and local governments, transit agencies, railroad companies, special authorities, special districts and private entities. Each dollar of Federal funds can provide up to $10 in TIFIA credit assistance and support up to $30 in transportation infrastructure investment (FHWA, 2011a).

The TIFIA credit program offers three types of financial assistance:

- Secured (direct) loans – Flexible repayment terms and provides combined construction and permanent financing of capital costs. Maximum term of 35 years from substantial completion and repayments can start up to five years after substantial completion.
- Loan guarantee – Full-faith-and-credit guarantees by the Federal Government and guarantees a borrower's repayments to non-Federal lender. Loan repayments must commence no later than five years after substantial completion.
- Standby line of credit – A secondary source of funding in the form of a contingent Federal loan to supplement project revenues, if needed, during the first 10 years of project operations and available up to 10 years after substantial completion.

The amount of credit assistance may not exceed 33 percent of reasonably estimated eligible project costs and the exact terms for each loan are negotiated between the USDOT and the borrower taking into account project economics, the costs and revenue profile of the project and any other relevant factors. Interest rates are equivalent to Treasury rates and depending on the

market conditions; these fixed rates can be lower than what most borrowers can obtain in the private markets.

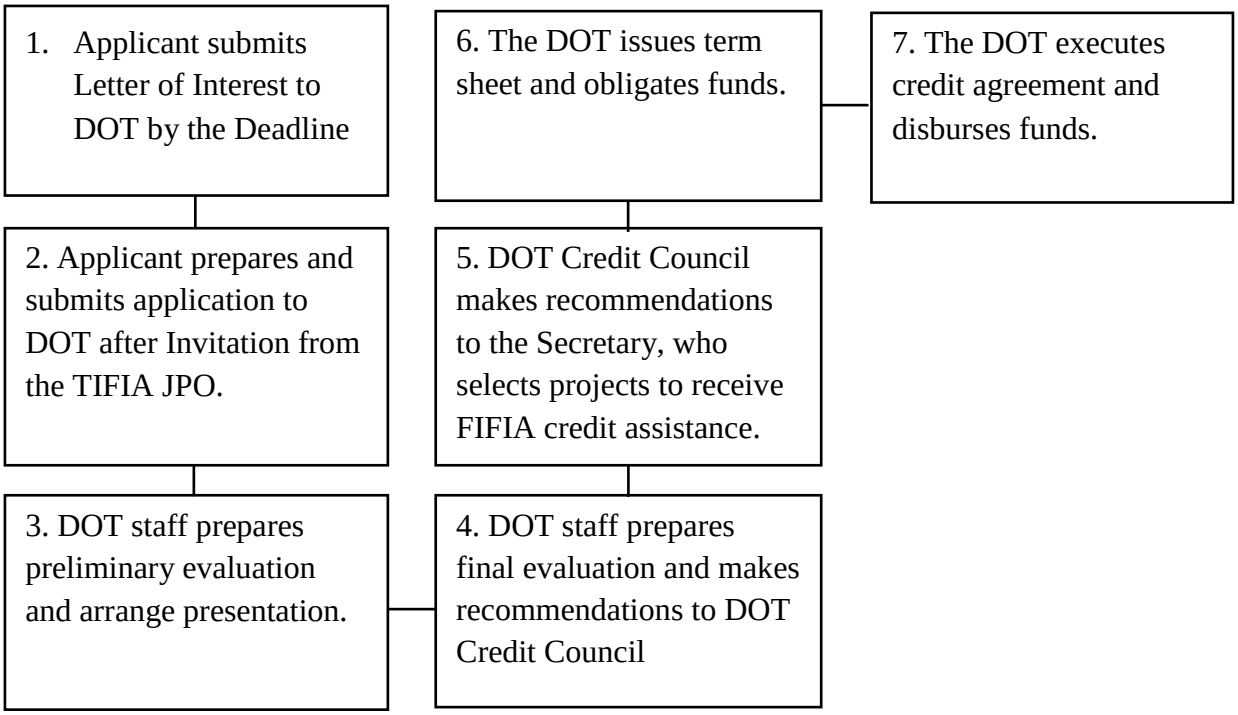
Any project that is eligible for Federal assistance through existing surface transportation programs is eligible for the TIFIA credit program and must be included in the State Transportation Improvement Program. Major TIFIA requirements include a capital cost of at least $50 million (or 33.3 percent of a state's annual apportionment of Federal-aid funds, whichever is less), senior debt must be rated investment grade and the project must be supported in whole or in part from user charges or other non-Federal dedicated funding sources (FHWA, 2011m).

Eligible project costs include:

- Development phase activities (planning, feasibility analysis, revenue forecasting, environmental review, permitting, preliminary engineering and design work, and other preconstruction activities.
- Construction, reconstruction and rehabilitation.
- Acquisition of real property.
- Acquisition of equipment and materials
- Construction contingencies.
- Costs of environmental mitigation.
- Certain financing costs, including capitalized interest, reasonably required reserve funds, and debt issuance expenses.

Costs incurred more than three years before the date of the application for TIFIA assistance will be considered on a case-by-case basis to be deemed eligible (FHWA, 2011i). The benefits of TIFIA credit assistance include revenue leverage, senior debt enhancement, interest costs savings, payment flexibility, project acceleration and long terms of maturity. TIFIA loans must follow all regulations as required in Title 23 of the Code of Federal Regulations that govern the design, construction, and operation of federally assisted highway infrastructure (FHWA, 2005). The TIFIA selection process has been summarized in Figure 6-2.

Figure 6-2 Selection and Funding of TIFIA Projects



Source: FHWA, July 2011

TIFIA loans have been used successfully for a number of transportation projects. In 2009, the North Carolina Turnpike Authority (NCTA) secured a direct TIFIA loan of $386.7 million with an interest rate of 4.25 percent to assist in the completion of the 18 Mile Triangle Expressway in Raleigh-Durham, North Carolina. The first interest payment is scheduled for January 2015, partial principal payments in January 2016, loan amortization beginning January 2025 and the final maturity of the TIFIA loan is June 2043 (FHWA, 2011j).

Secured by at $140 million TIFIA loan, the South Bay Expressway (SBX) is a P3 developed 9.2 mile toll road extending from San Miguel Road in Bonita to SR 905 in Otay Mesa near the International Border. The SBX connects the only commercial port of entry in San Diego to the regional freeway network. Caltrans, a private developer raised capital for the SBX in exchange for a 35 year toll concession. Caltrans owns the highway, leases the road back to the franchisee but control will revert back to Caltrans in 2042. The $140 million TIFIA loan is secured by a priority security interest in all project collateral including all income, tolls, revenues, rates, fees, charges, rentals, or other receipts derived or related to the operation or ownership of the project. The TIFIA loan was the first-ever provided to a private toll road development and the first to include both bank debt and private equity (FHWA, 2011k).

The Central Texas Regional Mobility Authority (CTRMA) was legislatively authorized in 2001 to form at the county level if a regional toll authority did not already exist to construct, operate, and maintain toll roads. In 2003, they were given the ability to issue toll revenue bonds and in

FY2005 began the construction of the 183-A Turnpike. The turnpike is an 11.6 mile north-south toll highway through Cedar Park and Leander in Williamson County northwest of Austin. Total cost was estimated at $304.7 million and a TIFIA credit agreement was signed in 2005 to provide for $66 million backed by net toll revenues. Mandatory interest, scheduled interest and principal payments begin in January 2012 and the final maturity of the loan is January 2042 (FHWA, 2011l).

In 2011, the North Texas Tollway Authority (NTTA) began issuing $800 million of bonds and $500 million of notes for the western extension of the President George Bush Turnpike. The NTTA negotiated a guarantee from the Texas DOT to cover any debt service in the event that the project revenues are insufficient and the bonds will be secured by the tolls of the Texas State Highway 161 Tollway. The NTTA is issuing the bonds in anticipation of a future $423 million TIFIA loan (Williamson, 2011).

Linking existing and proposed development areas between I-270/I-370 and I-95/US 1 corridors within central and eastern Montgomery County and northwestern Prince George County in Maryland, upon completion the Intercounty Connector (ICC) will offer a state-of-the-art, multi-modal east-west highway that limits access and accommodates the movement of passengers and goods (MDDOT, 2011). The total funding required for the six-year program is $2,462.7 million, with $516.0 million supported by a TIFIA loan. The TIFIA loan rate is 2.56 percent and the timing of future TIFIA loan draws depend primarily upon the comparison of the TIFIA loan rate versus that of Authority toll revenue bonds, but are current assumed to occur in FY2011 and FY2012 (MSHA, 2011).

State Infrastructure Banks (SIBs)

Currently, West Virginia does not have an SIB. Established and administered by states, a SIB resembles a private bank and can offer a range of loans and credit assistance enhancement products to public and private sponsors of Title 23 highway construction projects or Title 49 transit capital projects. The goal of a SIB is to give the states the ability to efficiently use its transportation funds and leverage federal resources by attracting non-federal public and private investment. State infrastructure banks can provide loans at subsidized rates and/or flexible repayment provisions, subordinated loans, short-term construction or long-term debt financing, capital reserves, letters of credit, lines of credit, bond insurance and loan guarantees, Grant Anticipation Revenue Vehicles, certificates of participation and direct or indirect interest rate subsidies (FHWA, 2011d).

SIBs are useful in facilitating funding, such as purchases of transit vehicles, purchases of infrastructure, construction of transit facilities, rehabilitation of transit facilities and local match requirements. Establishing a SIB can provide flexible project financing with low interest rates, extended repayment periods, construction grace periods, limited debt service reserve fund requirements, low expectations for debt coverage ratios and lower transaction costs.

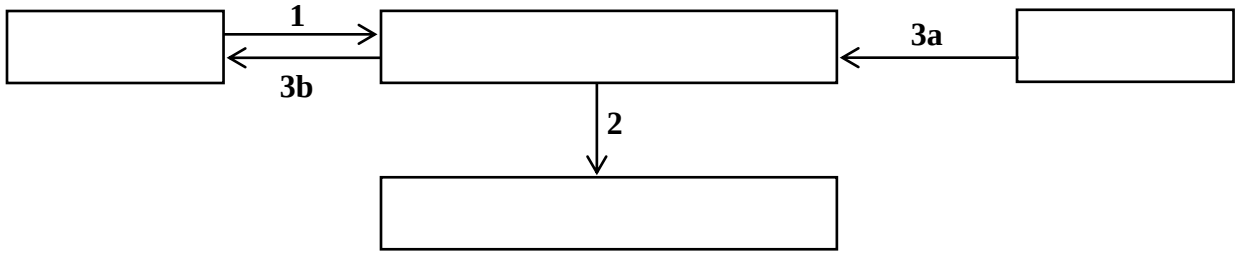
Although they provide many benefits, there are also limitations associated with a SIB. In a 2005 TransTech Management study on SIBs in public transportation, many constraints are discussed. Finding suitable projects, the capability to pay back loans can be difficult. The lack of revenue streams discourages the SIB from funding these projects; this is in addition to the fact that the demand for SIB loans is rather small. Public entities have greater access to grants and loans so often an SIB is overlooked as a source for transportation infrastructure funding.

The federal and state requirements of using a SIB are numerous and can delay construction schedules and often can increase project costs. To meet federal requirements a project must be included in the State Transportation Improvement Program (STIP) and should follow the federal project development process requirements in addition to many others. State laws and regulations are to be followed and can include human right regulations, workers compensation rules, building codes and wage regulations. It has been shown that state legislation regarding SIBs has been somewhat restrictive and is often out of line with established federal SIB guidance. Another shortcoming of SIB usage pertains to the requiring of loans being made to federal projects instead of state approved projects. This limits the SIB's ability to provide funding to other transportation programs within the state. Obtaining funds through the use of a SIB can be time consuming due to the lengthy application process, reporting requirements and payment of all applicable fees.

Grant Anticipation Revenue Vehicles (GARVEEs)

The FHWA has provided guidance for several federal debt financing tools, among them include Grant Anticipation Revenue Vehicles (GARVEES). A GARVEE is a type of anticipation vehicle (securities/debt instruments) issued when moneys are anticipated from a specific source to advance the upfront funding of a particular need. Federal-aid grants are the anticipated revenue source in the case of transportation finance. GARVEES can facilitate the formation of public-private partnerships by making an immediate and reliable source of funds available for transportation projects which can attract increased private sector involvement. Using GARVEEs allow the state to reimburse project costs when debt service is due, rather than reimbursement as costs are incurred (CEE, 2011). For highways, a GARVEE is used as a term for a debt instrument that has a pledge of future Title 23 Federal-aid funding and is authorized for Federal reimbursement of debt service and related financing costs. By using a GARVEE a state can receive Federal-aid reimbursements for a variety of debt related costs incurred in connection with an eligible debt financing instrument such as bond, note, certificate, mortgage or lease; the proceeds of which are used to fund a project eligible for assistance under Title 23. As stated in Section 122 of Title 23, debt financing instrument-related costs eligible for reimbursement includes interest payments, retirement of principal and any other cost incidental to the sale of an eligible debt issue. The issuer may be a state, political subdivision, or a public authority (FHWA, 2011f).

Figure 6-3 GARVEE Bond Process



1. Investors purchase bonds issued by state DOT: proceeds flow to state DOT
2. State DOT expends bond proceeds to construct Federal-aid debt-financed projects.
3a. State receives "cost-reimbursement" from FHWA for debt service expenses from its annual Federal-aid obligation authority.
3b. State DOT passes through Federal-aid reimbursements as debt service payments to bondholders over a multi-year term.

Source: FHWA, July 2011

GARVEES are typically used in conjunction with advance construction or partial conversion of advance construction to enable using Federal-aid funds for future debt service payments. Using GARVEE bonds enables a state to accelerate construction timelines and spread the costs of a transportation facility over its useful life rather than just the construction period. GARVEEs allow a state to accelerate construction timelines and spread the costs of a transportation facility over its useful life rather than just the construction period. Using GARVEEs can expand access to capital markets as an alternative or in addition to the potential general obligation or revenue bonding capabilities. This approach is appropriate for large, long-lived, non-revenue generating assets (AASHTO, 2011c).

Different types of GARVEEs are available and include short term GARVEEs where the term of the notes do not exceed the federal reauthorization period or long term GARVEEs which extend past current authorization periods. Most GARVEEs have certain provisions and can include backstopped GARVEEs, Naked GARVEEs, Direct GARVEEs, and Indirect GARVEEs. *Backstopped GARVEEs* involve a pledge of another revenue source, such as a state's gas tax, general obligation authority, vehicle registration revenues, or toll revenues to provide for any potential shortfalls between Federal revenues and the existing debt. More backstops equate to lower risk for investors. *Naked GARVEEs* (stand-alone or non-recourse) are bonds where the credit worthiness of the bonds is dependent upon future federal funds. No backstops or other forms of guarantees are involved although bond insurance is available to increase the attractiveness. *Direct GARVEE* bonds are those in which Federal assistance directly reimburses debt services paid to investors or directly repays the debt for a specific project. The projects receive prior approval from the FHWA and the debt service is paid directly with the federal

funds for the project. *Indirect GARVEEs* do not have to support specific Federal-aid projects but are repaid indirectly by federal funds from other transportation projects. Indirect GARVEEs are considered to be more flexible as they do not require Federal approval, are free from federal requirements and can be used to pay the debt for any number of transportation projects (Puentes and Warren, 2005).

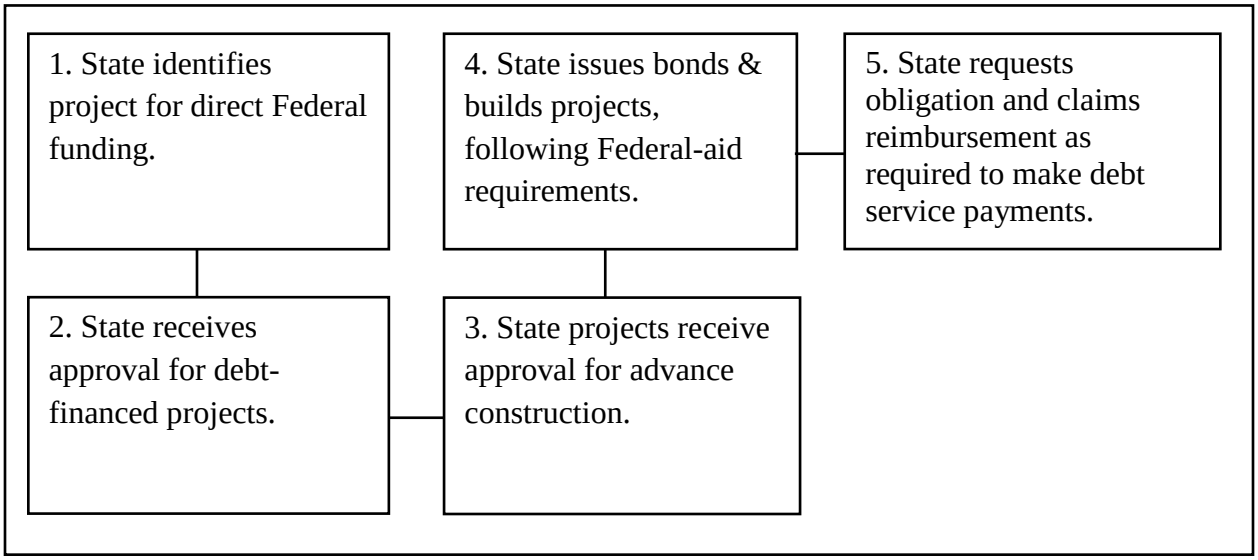
Table 6-5 Federal-Aid Project vs. GARVEE Debt-Financed Project

	Standard Federal Aid Project	GARVEE Debt-Financed Project
Cost Eligible for Federal Reimbursement	Eligible construction costs.	Debt service (including principal, interest, and issuance) for bond issue to finance eligible Federal-aid project.
Basis for Reimbursement	Construction expenditures.	Debt service payments.
Timing of Reimbursement	Period of construction.	Term of debt.
Federal Requirements	All applicable.	All applicable.
What Shows on STIP?	Total funds needed to reimburse construction expenditures during fiscally-constrained years of STIP.	Total funds needed for debt services during fiscally-constrained years of STIP.

Source: Werner, 2007

Some states prefer to issue a Direct GARVEE bond to claim interest and issuance costs while preserving a direct link between the project and funds used to repay its debt service. Others may sacrifice the additional eligibility for interest and issuance to issue an Indirect GARVEE as it may allow them to use construction reimbursements from a variety of projects for debt service. Difficulties arise when using Indirect GARVEES as construction reimbursements become subject to appropriation by state legislature when received or are restricted by state law (FHWA, 2011d).

Figure 6-4 Steps in the GARVEE Process



Source: Werner, 2007

From 1997 through 2008, 20 states including Puerto Rico and the Virgin Islands have issued GARVEE bonds, totaling $9.3 billion for a variety of projects including bridges, roads, interstate widening and rehab, and other forms of road enhancements.

The Transportation Expansion (T-REX) project in Denver began in 2001 as a way to widen major interstates, reconstruct interchanges as well as make needed light rail improvements in the Denver area. No new taxes were levied; no taxes were increased as the project used $195 million in sales and use tax revenues while issuing $600 million in GARVEES to fund the highway portion of the project. The T-REX project was also the first design-build contract to incorporate major highway and transit elements into the same project and the use of design-build expected an estimated 22 months of time savings (CDOT, 2011).

Idaho publishes a yearly Annual GARVEE Report to provide updates on their GARVEE Transportation Program and the status of funding authorizations and bond sales supporting the program. The program was created with an initial capacity of $998 million which was calculated based upon limiting the ultimate debt service payments to 30 percent of federal aid apportionments. In the September 30, 2010 report it shows that to date, the state has $693 million in authorizations and has sold four series bonds to finance $657 million worth of projects with a weighted average of 4.54 percent interest on all bonds sold. The GARVEE Transportation Program covers projects in six corridors throughout Idaho and effective August 2010; $642.2 million of the GARVEE funds were obligated. Of the six corridor projects, four were fully funded and the overall progress of the GARVEE program in Idaho is as follows: U.S. 95, Garwood to Sagle partially funded at $88 of $167 million; U.S. 95, Worley to Setters fully funded at $55 million; Idaho 16, I-84 to Emmett partially funded at $54 of $132 million; I-84, Caldwell to Meridan fully funded at $255 million; I-84, Orchard to Isaacs Canyon fully funded at

$116 million and U.S. 30, McCammon to Soda Springs fully funded at $88 million. A competitive construction environment has generated substantial savings from projects bidding lower than originally estimated (IDT, 2010).

In 2004, the state of Georgia began the Fast Forward Congestion Relief Program to address Georgia's congestion problems. Fast Forward is a comprehensive 6-year $15.5 billion transportation program designed to relieve congestion and encourage economic growth. The use of GARVEEs encourages quick growth and will reduce project completion time from 18 years to 6 years as well as providing $3 billion in funding (GDOT, 2010).

The previously discussed MDDOT Intercounty Connector Project's funding package also contains GARVEE bonds. Of the total $2,462.7 million in funding required, $750 million will be funded by GARVEEs. In June 2007 a total of $341.9 million in GARVEE bonds was issued, with the second issuance of $425 million occurring in December of 2008. Maryland Transportation Trust Fund revenues have been used to support debt service in the event future federal aid is insufficient to pay (MSHA, 2011).

Section 129 Loans

Section 129 of Title 23 allows Federal participation in a state loan to support projects with a dedicated revenue stream through the use of tolls, excise taxes, sales taxes, real property taxes, motor vehicle taxes, incremental property taxes or other forms of beneficiary fees. Using Section 129 loans allows the states to leverage additional transportation resources and recycle assistance to other eligible projects in addition to being able to negotiate interest rates. Section 129 loans are similar to SIBs; however, there are fewer requirements for these types of loans.

Public-Private Finance Mechanisms

Pass-through tolling and the use of availability payments have been successful forms of P3s for past highway projects.

Pass-through/Shadow Tolls

A pass-through toll is a per-vehicle or per-vehicle-mile toll measured by the number of vehicles using a highway. The fees are not paid by motorists but rather by the state or local agency to a private concessionaire as reimbursement for services that could include design, build, maintenance and/or operation of a roadway for an agreed period of time. The amount of the toll payments to the private entity are dependent on the volume of traffic using the road and provide a great incentive for the optimization of the project.

In the United Kingdom, pass-through tolls are commonly referred to as shadow tolls and have been shown to provide many benefits through implementation. Most of the benefits are typical of a P3 project delivery and can include minimized traffic risks, accelerated construction, elimination of risk and avoiding the need for toll plazas (AASHTO, 2011b).

Availability Payments

Availability payments are similar to pass-through tolls and provide compensation to a private entity for its role in the design, construction, operation and maintenance of a tolled or non-tolled roadway for a determined amount of time. The payments are made by the public project sponsor and are based on particular project milestones: the completion of the facility by a certain deadline or performance standards and metrics that can be measured and quantified. Toll facilities that are not expected to generate adequate revenues to pay for their own construction and operation are ideal for availability payments. The structure of availability payments can differ as no payments may be made until after construction is complete, or until construction milestones are complete. The private entity assumes more risk and are able to dictate the payment cap and how often payments are made (AASHTO, 2011a).

Other Financing Mechanisms

Other types of bonding and debt instruments are available for the finance of surface transportation projects and could be used in conjunction with a P3. Municipal/public bonds, revenue bonds, limited and special tax bonds, private bonds and certificates of participation are all feasible options in advancing highway infrastructure (FHWA, 2011g). The State of Vermont successfully sold $14.4 million in Vermont special obligation bonds to aide in rebuilding the Lake Champlain Bridge as well as providing funds for other needed transportation infrastructure repairs and improvements. The bonds are backed by the State's new Motor Fuels Transportation Infrastructure Assessment (MFTIA) passed by the State Legislature in 2009. The bonds mature in increments of between one and 20 years and pay a total interest cost of 3.2 percent (Vermont.gov, 2010).

Reclamation Performance Bonds

Surface coal mining is regulated by the Surface Mining Control and Reclamation Act (SMCRA) of 1977 (SMCRA), which created the Office of Surface Mining Reclamation and Enforcement. One goal of the SMCRA is to assure that mines are reclaimed as contemporaneously as possible with surface coal mining operations while protecting the environment from problems including but not limited to water quality (GAO, 2010). The SMCRA requires mine operators to follow the necessary procedures to obtain a permit before any mining takes place. In order to obtain a permit, detailed plans must be submitted outlining the extent of the mining operations, how reclamation will be achieved and the estimated per-acre cost of reclamation. SMCRA also requires the mine operator to submit a bond in an amount sufficient to ensure that funding will be available to complete the reclamation if the operator fails to do so, all of which must be pledged to the regulatory authority.

The minimum amount of the bond is determined by the regulatory authority and is based on the estimate of reclamation costs provided by the mine seeking a permit. An independent analysis is also completed by the authority to determine the amount that would be necessary for a third party to complete the reclamation plan should forfeiting of the bond occur. Typically the bond

includes reclamation costs at the projected point of maximum reclamation liability within the permit area or an initial increment of the area. The initial calculation of bond amounts will not include remediation costs for events such as acid mine drainage and landslides that are not anticipated. A new bond must be posted before any new acreage is mined or when the costs of future reclamation increase and a mine may apply for partial bond release as phases of reclamation are complete and the regulatory authority must conduct a bond adequacy review whenever the approved permit is revised (OSM, 2000). The provider of the bonds must follow all rules and regulations established by state insurance commissioners, state banking examiners and the Comptroller of the Currency (OSM, n.d.). Additional performance bonds are required to cover repair, replacement or compensation resulting from inadvertent damage to a protect structure during the surface mining process.

Reclamation performance bonds are posted to cover all operations during the term of the permit. Before a permit is issued, the mining company must post a bond to cover the entire permit area, the initial area of land to be affected under a cumulative bond schedule or the initial area of land to be affected under an incremental bond schedule (OSM, n.d.).

Three major types of bonds are recognized by OSM regulations: surety bonds, collateral bonds and self-bonds. A surety bond is a bond in which a surety company guarantees the performance of reclamation by the mining company. If the mining company fails to complete reclamation, the surety company is required to pay the bond to the regulatory authority, although the opportunity may exist for the surety to perform the reclamation instead of paying the bond amount. However, the surety must comply with all of the reclamation requirements established during permit issuance. Collateral bonds include cash, certificates of deposit, liens on real estate, letters of credit and other forms of securities deposited directly with the regulatory authority. When a self-bond is used, the mining company guarantees its own performance with or without separate surety although operators must meet certain financial conditions to use a self-bond. Some states have opted to not allow self-bonds as an option for the mine operator. If permitted, self-bonded mines must maintain a tangible net worth of at least $10 million, possess fixed assets in the U.S. of at least $20 million and have either an "A" or higher bond rating or meet the criteria of several financial ratios (OSM, n.d.). Any collateral used as bond must be owned solely by the mining company, be free of all liens and valued at current market value.

An alternate form of guaranteeing reclamation is to use a "bond pool." With a bond pool, the operator may post a bond for an amount determined by multiplying the number of acres in the permit area by a per-acre assessment, which varies depending on the site-specific characteristics and history of regulation compliance. To supplement the per-acre bond, the operator may be required to pay a fee for each ton of coal mined or other types of fees. The funds are then placed within a pool and can be used to reclaim sites that participants in the alternative bonding system do not reclaim. If the amount is insufficient to pay for the full costs related to reclamation, the operator remains liable for the remaining costs and is open to the possibility of a lawsuit (GAO,

2010). Under OSM regulations, all alternative bonding systems must provide a significant economic incentive for the mining company with reclamation requirements and must ensure that the regulatory authority has adequate resources to complete the reclamation plan for any sites that may be in default at any time (OSM, n.d.).

West Virginia has received the necessary approvals to implement an alternative bonding system to satisfy the SMCRA's reclamation requirements; all mine operators must participate in this system. The site-specific per-acre bond has been limited to between $1,000 and $5,000; the state collects 14.4 cents per ton of clean coal produced. This covers the entire permit area or the increment of land within the permit area where the operator will conduct surface mining and reclamation operations. The period of liability includes the issuance of the permit and continues for the full term of the permit plus any additional period necessary to achieve compliance with the requirements in the reclamation plan of the permit.[6] These funds are deposited into a Special Reclamation Water Trust Fund and Special Reclamation Fund. As of June 2008, the combined balance for the two funds was $46.9 million (GAO, 2010).

The purpose of the Special Reclamation Water Trust Fund is to assist in guaranteeing a reliable source of capital to reclaim and restore water treatment systems on forfeited sites. The Special Reclamation Fund was created to assist in the reclamation of lands subjected to permitted surface mining operations and abandoned after August 3, 1977. The amount of the bond posted and forfeited is less than the actual costs of reclamation and does not meet eligibility for abandoned mine land reclamation funds. The Special Reclamation Fund is monitored by an advisory council created by the West Virginia Legislature in 2001. The purpose of the advisory council is to ensure the effective, efficient and financially stable operation of the fund (GAO, 2010). The council completed a study in January 2009 but found that, based on projections from a formal 2008 study, the fund would be negative by the year 2015. To ensure the state would have sufficient funds to carry out required reclamation projects, the West Virginia legislature set the tax rate at 14.4 cents per ton, effective July 2009, and called for a review every 2 years. Assuming a rate of 14.4 cents per ton and new permits at current bond values, both the Special Reclamation Fund and the Special Reclamation Water Trust Fund are expected to provide sufficient revenue to last through 2044 and 2038 respectively. During 2009, the special reclamation tax provided about 81 percent of the revenue for the Special Reclamation Fund and had a cash and investment balance of approximately $58 million (OSM, 2011). The funds brought in by surface mining are also monitored by The West Virginia Department of Environmental Protection (WVDEP). The WVDEP conducts an informal review of the Special Reclamation Fund and Special Reclamation Water Trust Fund every year with a formal review scheduled for every other year.

[6] West Virginia Code §22-3-11

Once all of the reclamation requirements have been met, the regulatory authority may release the bond. However, the mining company can apply for release of the bond on all or part of the permit area as reclamation is completed. There are three phases of reclamation taken into consideration for bond release. Phase I includes back filling, regarding and drainage control; phase II occurs after topsoil replacement and reestablishment of vegetation; and phase III requires meeting the vegetation success standards and follows completion of the vegetation responsibility period provided the site remains in compliance with all applicable reclamation requirements (OSM, n.d.).

The OSM has announced that bonding is a national priority of their 2010 annual state mining programs. These evaluations would assess whether the states method of determining bond amounts ensure that adequate funds are available; bond calculation methods include a mechanism to adjust bond amounts or provide financial assurance to cover the cost of unanticipated long term post mining pollution discharges. The state revaluates the bond amount each time a permit is revised or renewed (GAO, 2010).

The OSM is also proposing a rule to address concerns, such as the nonexistence of legal requirements for operators to apply for bond release in a timely manner. Another potential rule would require mine operators to submit an annual status report to the regulatory authority with information on areas that are permitted, bonded, disturbed, backfilled/graded, newly planted and have reached one or more of the phases of bond release. The OSM feels that the current data is not sufficient enough to prove whether or not the reclamation of a mine site has been adequate. It is important to note that the OSM can use additional SMCRA provisions to address environmental problems at former mine sites. SMCRA regulations can require a mining agency to reassert jurisdiction over a mine site after a bond release if it can demonstrate that the release was based on fraud, collusion or misrepresentation of a material fact. Reassertion can involve reopening the permit and requiring a new bond (GAO, 2010).

Not only are reclamation bonds required by the OSM, Section 404 of the Clean Water Act requires that a permit be issued by the US Army Corps of Engineers providing for the discharge of material into the waters of the United States. Particularly at valley fills, this discharge may bury streams and require compensatory mitigation, such as creation of a new stream, enhancement of a degraded stream or preservation of an existing stream. The Corps have the necessary authorization to require financial assurances when approving section 404 permits. These types of assurances can come in the form of bonds, escrow accounts, casualty insurance, letters of credits and legislature appropriations. The assurances are calculated by the district engineers and are based on the size and complexity of the mitigation projects, likelihood of success and past performance of the projects sponsor. Financial assurances must be released once the district engineer has determined that the mitigation projects have successfully met the standards, often after a period of 5 years. However, in the past, the period has been extended for longer projects (GAO, 2010).

The Army Corps of Engineers has not required operators with section 404 permits to provide financial assurances to ensure mitigation has been completed as they do not have statutory authority to directly hold and use performance bonds for mitigation purposes. If financial assurances are needed, a third party is used to hold the assurances and complete the mitigation; however, there are very few third parties that have the ability to conduct stream restoration. Mine operators have had sufficient capital to complete the required mitigation or have successfully demonstrated an ability to complete other mitigation projects which makes it difficult to require financial assurances. It is assumed that mine operators will comply with mitigation requirements without the addition of financial assurances.

The Corps relies on mechanisms and methods other than financial assurances to guarantee that the mitigation will be completed. At times they will require the operator to prepare an adaptive management plan that identifies alternation mitigation actions should the elements of the original plan not succeed. Not only is an adaptive management plan required, but a contingency plan that identifies alternative compensatory mitigation should the approved project fail. These contingency plans could require that the operator purchase mitigation credits from an in-lieu-fee program if the planned mitigation does not succeed. The in-lieu-fee programs are sponsored by public or nonprofit entities in which they receive payments from multiple operators required to perform compensatory mitigation. The sponsors will then use these funds to implement compensatory mitigation projects (GAO, 2010).

Miscellaneous

Offering special revenue generating license plates to businesses that register company fleets in West Virginia could assist in providing capital for transportation projects and infrastructure. The Virginia Department of Motor Vehicles is currently exploring this option and feels that allowing the DMV to issue plates bearing a company's logo would lead to more fleet registrations by offering an easy and affordable advertising option. The plates would have a one-time fee to cover the costs of production and a modest personalization fee but would only require the annual standard registration year for future years (Governor McDonnell's Commission on Government Reform & Restructuring, 2010).

Comprehensive pricing options are available and could include a pay-as-you-drive insurance program where insurance premiums are based on vehicle miles traveled instead of a traditional flat annual rate. A pay-as-you-go insurance plan would not have the ability to raise substantial surface transportation revenues, but it could allow the government to pay for infrastructure. For example, a $375 premium becomes on average 3 cents per mile and a $1,250 annual premium becomes on average 10 cents per mile (NSTIFC, 2009).

Tolling & Roadway Leasing

There are numerous examples, both domestically and abroad, that provide insight to the use of P3s for funding roadway development projects. As work on the KCH progresses, the state

should pursue any opportunity to increase the likelihood of on time completion. The Texas DOT has created a Comprehensive Development Agreement (CDA) as a project delivery tool to design, construct, rehabilitate, expand and improve a transportation facility. A CDA includes finance, right of way acquisition and maintenance and/or operation of a transportation facility while requiring several conditions to be met. These include agreements regarding tolls, the use of real property, lease provisions and compliance with federal requirements (Cui and Lindly, 2010).

Not only has Texas established framework and processes for development, in 2006 they also signed a concession agreement to facilitate the construction of the $1.8 billion southern 40 miles of the State Highway 130 project. The Spanish-American joint venture, Cintra-Zachry proposed to finance the extension from SH 130 to US 183, agreed to pay the state $25 million up front and share future toll revenues. In return Cintra-Zachry would have the right to collect a portion of the tolls for 50 years but would also fund millions in right of way costs. A maximum base rate for tolls was established at 12.5 cents per mile and electronic toll collection would be used throughout the roadway, keeping traffic 100 percent free flowing (Cui and Lindly, 2010). This example provides an excellent framework for potential P3 agreements for the state. If further progress on the KCH cannot be completed due to lack of available surface mining options along the route, a similar arrangement should be considered. Not only did the state benefit from the timely completion of the needed roadway, they also received immediate capital and the promise of future cash flows. It is important to note that the state still played a key role in the setting of toll rates and other key aspects of the project.

If a P3 is established, and tolls are eventually enacted by the private entity, it is necessary for the state to play a role in setting toll rates, specifically the maximum amount and the growth formula. By doing so, the state can remove pricing flexibility and will require future toll rate projections. The state cannot lose sight of the fact that the benefits of toll roads are extremely sensitive to the actual toll rates, which is shown with unpriced close substitutes. When these substitutes exist, a toll that is too low will encourage excessive traffic while a toll set too high will encourage more travelers to drive on the already congested substitution routes (Small, 2010). Unfortunately, according to West Virginia Transportation Secretary Paul Mattox, there is not enough potential traffic to justify tolls (Porterfield, 2010).

There are other examples where P3s were developed and funded through the use of tolling and tax exempt bonds. The IRS ruling 63-20 of 1963 enables the government to form nonprofit entities that can issue tax exempt bonds to finance tangible public assets (Meulen, 2009). In these cases, private partners were more engaged in the complete process of the project. However, it is important to note these funding mechanisms as alternatives and as plausible methods for funding the KCH.

A 63-20 tax-exempt toll revenue bond was used as an initial funding source for construction of a roadway near Richmond, Virginia. The project had been planned for many years but due to lack of funding the Virginia Department of Transportation (VDOT) was unable to focus on completion. Many municipalities set up non-profit entities and use these types of bonds in order to avoid reaching legislated debt limits. An Australian toll road operator, Transurban, partnered with the entity created for the roadway, the Pocahontas Parkway Association, to take advantage of the lower interest, tax-exempt bonds. Under the terms of the agreements, Transurban acquired the sole rights to enhance, manage, operate, maintain and collect tolls on the parkway for 99 years (NCHRP, 2009). The contract included the establishment of toll levels and increases which were capped at $0.50 a year through 2010 and $0.25 a year through 2016. It also provided for a revenue sharing mechanism between Transurban and VDOT should revenue exceed expectations (NCPPP, n.d). In addition, Transurban has paid off all of PPA's underlying debt with revenue generated from the highway that is collected in the form of tolls from users as a fare for passage (Meulen, 2009). This was only the second transportation project nationwide that utilized the 63-20 funding method; because of this financing approach, the road was able to be built without a 15 year delay to gather the necessary financial resources from the state. Of the total $324 million project total, $27 million was used in public funds with the remainder being raised through the sale of private bonds (FHWA, n.d.).

Eminent Domain

West Virginia reserves the right to exercise the power of eminent domain, should private property provide a feasible option for the future of the KCH and other development options.[7] Public uses for which private property may be taken include for the construction or maintenance/operation of railroad and traction lines, bridges, public roads, streets, alleys, parks and other works of internal improvement. This not only includes potential sections of the KCH but any rail lines, bridges and roadways that would be necessary to provide access to the KCH or transportation facilities nearby. Construction and maintenance of telegraph, telephone, electric light, heat, power plants, systems, lines, transmission lines, conduits and stations, as well as water plants/systems and sewer systems, are included in the state eminent domain code. Access to utilities is not only a requirement for the KCH but also for future development of industrial or commercial land use along the route. Eminent domain allows the state to obtain land in order to provide the appropriate utilities.

Timing Issues

Proper timing throughout the P3 project cannot be underestimated. Timing is particularly important during the planning and bid solicitation process. The public and private entity must inform the public of their plans for a P3 in a timely fashion, ensuring that enough time exists to

[7] West Virginia Code §54-1-2

detail the costs, benefits and general information around the arrangement. If the state fails to convey the information regarding the potential P3 to the public, unrest can occur and the likelihood of garnering support will decrease substantially.

In terms of timing and delivery of a project, it has been found that using a P3 delivers greater price certainty and more timely delivery of quality assets rather than conventional approaches. In 2003, the United Kingdom's National Audit Office (NAO) completed a review of the nation's Private Finance Initiative, equivalent to a P3 program. A decrease in budgetary issues was observed; however, in regards to timing of delivery, only 24 percent of the P3 projects were delivered later than the date specified in the contract while approximately 70 percent of projects using a conventional approach were delivered late (NSTPRSC, 2005). The ability of a P3 to deliver needed projects quickly increases the overall attractiveness of this delivery option rather than a conventional approach. Regardless of delivery method, costs can increase if proper timing is not exercised.

Short & Long Term Strategy

In the short term, the WVDOT should develop and implement education and training guidelines for P3 program managers, procurement officers, contract managers, financial specialists and a dedicated legal team (Brown et al., 2009). This is particularly important for West Virginia as potential P3s might not fit in the conventional mold and include processes such as surface mining, coal extraction and creating roadbed. Establishing the proper processes and ensuring familiarity for all parties involved will increase the likelihood of P3 success in West Virginia.

Table 6-6 P3 Strategy Summary

Short-Term	Medium-Term	Long-Term
Education • Form a state-wide P3 project task force. • Create and hold executive workshops. • "State of Practice" publications. • Develop guidebooks describing attributes of P3 programs and projects. • Engage industry organizations to develop medium and long term education.	*Research* • Develop case studies of representative projects. • Examine and identify knowledge, skills and abilities needed. • Investigate appropriate metrics for cost and benefit assessment of P3s.	*Transfer* • Develop & public guideline documents pertaining to establishing, identifying/evaluating, procuring, creating, managing and measuring P3s.

Source: International Technology Scanning Program, June 2008

Development of a strategy to facilitate P3 research will further promote success. This includes an investigation of advantages and disadvantages of P3 organization as well as an examination of methods for identifying and analyzing potential P3s. Developing a strategy that includes performance metrics to assess the benefits and costs of P3 programs, as well as overall project and program performance, will establish a system of measuring past P3s and guaranteeing that future P3s will achieve the desired results.

Long-term actions should include the development and publishing of principle and guideline documents in order to update or complement any existing state or federal documentation. This should include the P3 establishment process, identification and evaluation of potential P3 candidates, procurement processes, contract creation, P3 management and measurement/evaluation of project performance (Brown et al., 2009). Creating or modifying new legislation to encourage P3s will take time and should be considered a long-term goal. This can include new or revised legislation in order to allow private entities control of public assets or legislation aimed at preventing frivolous tort claims against a private partner.

Establishing the correct mix of incentives to further P3 development in West Virginia should be considered a long-term strategy. Tax credits and New Market Tax Credits are effective in promoting development in our state but should not be offered without an analysis of the effect these credits will have on the state revenue; this also holds true for severance taxes and reclamation fees. A reduction in severance taxes would induce motivation for coal companies to mine coal quickly and perform the actions necessary to complete the roadbed. Altering the definition of reclamation to include roadbed creation would not only take legislative actions but more than likely require additional approvals from the EPA. Severance tax reduction would take a concerted legislative effort.

CHAPTER 7: PRINCIPAL FINDINGS AND RECOMMENDATIONS

A public-private partnership (P3) can provide an alternative source of capital to help deliver high priority transportation projects. The State of West Virginia is in a position to reap the economic and environmental benefits of using P3s to facilitate the development of the I-73/74 Corridor and several suggestions and recommendations have been offered. This chapter will include a discussion of key issues for consideration when exploring possible P3s for highway infrastructure development. Particularly, the chapter will offer recommendations for future P3s in West Virginia as well as an outline of federally sponsored programs that can facilitate P3s. A discussion of P3 opportunities in West Virginia for transportation infrastructure projects not related to the KCH is included. Lastly, guide actions that should be implemented in order to encourage P3s and promote overall success are discussed.

Key Findings

In the United States, the use of P3s to finance infrastructure projects is gaining momentum due to a decline in government spending on infrastructure. With a P3, the public sector can avoid an increase in State debt, construct new facilities without substantial public investment or funding, transfer project costs and risk factors, accelerate project delivery and expand access to private capital markets. The private entity has greater financial ability and is able to use innovative technologies as well as cost cutting measures without sacrificing the project's integrity.

Importantly, some P3s fail while others succeed. A successful P3 will create synergy between the state, society, industry and the market; creating the framework for success is vital. The general public associates P3s with privatization and slower project delivery; however, studies have shown that P3s are responsible for faster design and construction times both domestically and abroad. Concession agreements that outline project performance standards protect public interests by promoting economic stability.

The lack of state and local legislation is a formidable roadblock to P3s in many states. Fortunately the West Virginia Legislature enacted legislation enabling the use of P3s for transportation projects in 2008. As of September 2011, only 26 states had legislation authorizing P3s (FHWA, 2011g) which shows a lack of direction and framework for future legislature, and could hinder potential P3 arrangements. The USDOT has provided the Model Legislation statute to assist states with examples and information to consider when considering P3 legislation.

Environmental legislation can hinder the development of P3s with the coal industry for mined land. A specific hindrance is the Clean Water Act Section 404 standards concerning the impacts of fill material from surface coal mining operations on the streams and rivers in the KCH area. The Environmental Protection Agency (EPA) is not required to weigh the impact on jobs and businesses when approving, delaying, denying or revoking mine permits (Ward Jr., 2011). Although surface mining is a highly contested form of coal mining, Post Mine Land Use Master

Plans (PMLUMP) provides an opportunity for potential P3 arrangements. The passage of Senate Bill 1011 in 2009 required all counties with surface mined properties to complete a PMLUMP with areas designated for commercial, industrial, housing, agricultural and residential development. In Mingo County successful post mine land use (PMLU) projects include Twisted Gun Golf Course, the Hatfield-McCoy Trails, Mingo Central Comprehensive High School and Wood Products Industrial Park. Future PMLU projects in Mingo include an off-highway vehicle park, an air transportation park, a wood fired power plant and a new 4H camp. An estimated 1,880 jobs are expected to be created by these projects. Potential PMLU projects to help diversify the economy in other areas along the KCH not feasible for large-scale industrial development can include agribusiness and agritourism as well as residential and commercial options. Providing tax incentives to companies that use post mine land would encourage and attract potential projects. Commercial development will be attracted to new high-traffic areas, particularly along the new interchanges. These areas could include US 52 on both sides of Williamson and on the McDowell/Wyoming county line, WV Route 16 and US Routes 19 and 460 (WVkingcoal, n.d.).

The Chicago Skyway, Indiana Toll Road, Coalfields Expressway and both the Buffalo Mountain and Red Jacket sections of the KCH all show the benefits of using P3s for project delivery. The innovative KCH P3 approach can present a potential national model for the Coalfields Expressway in Virginia and other transportation projects in Ohio and Kentucky. Alpha Natural Resources (ANR) and CONSOL Energy Inc. (CONSOL) signed P3s to leave rough roadbed in place for future KCH development at two West Virginia surface mine locations when they complete coal extraction. The ANR "Red Jacket" project is estimated to reduce construction costs by over $170 million while the CONSOL Buffalo Mountain Initiative will save approximately $110 million.

Based on model assumptions and input values, our study estimated the short- and long-run economic and fiscal impacts of the I-73/74 NHS corridor using REMI, an economic modeling software designed to produce year-by-year estimates of the total regional effects of a policy proposal. Two scenarios were developed: Scenario I assumed completion of the corridor with full government spending and without the use of P3s while Scenario II assumed completion using P3s. The REMI results showed that while both scenarios have a positive impact on the study region, Scenario II provided larger economic benefits for total employment, gross regional product and personal income. Based on our analysis, total employment peaks in 2012 for both scenarios but gradually decreases each year until 2027 (Scenario I) and 2025 (Scenario II) when employment remains relatively consistent. Total employment showed larger impacts due to the faster completion of the roadway in Scenario II. The construction industry will benefit from the completion of I-73/74, particularly in the short-run when construction begins on future sections of the roadway. Long-run effects show that the service industry (accommodations and food services) will increase and sustain in the long-run. Net impacts on the Gross Regional Product (GRP) display a similar trend. While both scenarios are overall positive to the study area,

Scenario II provides faster and greater impacts than Scenario I. With construction beginning in 2012, GRP has been estimated at $28 million for Scenario I and $42 million for Scenario II. The positive impact of using P3s offers a consistently and higher GRP during the remaining 38 years and in 2050 GRP is estimated at $15 million for Scenario I and $29 million for Scenario II. Personal income increases substantially as construction and service industry jobs are created. With the exception of a couple of years in each scenario where personal income decreases, the overall effect of I-73/74 on personal income is immense. Between the years 2012 and 2050, personal income increases from $17 million to $82 million in Scenario I and $26 million to $132 million in Scenario II. Industry output will be high in the short-run when construction begins in 2012 due to the increased number of construction jobs and has been estimated at $51 million and $76 million for Scenario I and II respectively. Once construction is completed, industry output decreases but maintains a small but consistent increase due to service job increases. The employment, GRP, personal income, and industry output results all prove that using P3s for the completion of I-73/74 is desired not just from a cost and time savings standpoint but can also provide significant economic impacts.

As for fiscal impacts, the state of West Virginia can expect substantial increases in tax revenue. The REMI model also estimates fiscal impacts in a region due to policy changes by combining actual fiscal data and economic/demographic data to produce year-by-year revenue and expenditure results. Using the two scenarios for the completion of I-73/74, it was found that the majority of tax revenue sources would increase during the study period. In 2012 Scenario I is estimated to bring about $278,823 in total tax revenue increases while Scenario II tax revenue changes are estimated at $603,426. I-73-74 is expected to contribute to increased tax revenues during the duration of the project and in 2050, the final year of our study; Scenario I and Scenario II revenue impacts are estimated to be $254,014 and $579,478.

Recommendations

1. Project Selection

Potential P3s should be selected based on the needs of the state and future plans. The "high-priority" designation of the "I-73/74 North-South Corridor," makes these roadways vital to the economic future of West Virginia. The decision to engage in P3s with both CONSOL and ANR to create roadbed that will be used for the I-73/74, allows the state to meet its future transportation needs while keeping new state infrastructure construction costs low. The dissimilar topography and natural resources in counties along the I-73/74 affect project selection. Long term strategies to help diversify the local economy must be customized; not every tract is rich in coal deposits or suitable for large-scale industrial development. From the state's perspective, projects should provide significant economic benefits, facilitate I-73/74 completion and support the HUD-DOT-EPA Partnership for Sustainable Communities. The partnership was established in 2009 with a goal of improving access to affordable housing, more transportation

options and lower transportation costs while protecting the environment in communities nationwide. The partnership's livability principles include[8]:

- Provide more transportation choices.
- Promote equitable, affordable housing.
- Enhance economic competitiveness.
- Support existing communities.
- Coordinate and leverage federal policies and investment.
- Value communities and neighborhoods.

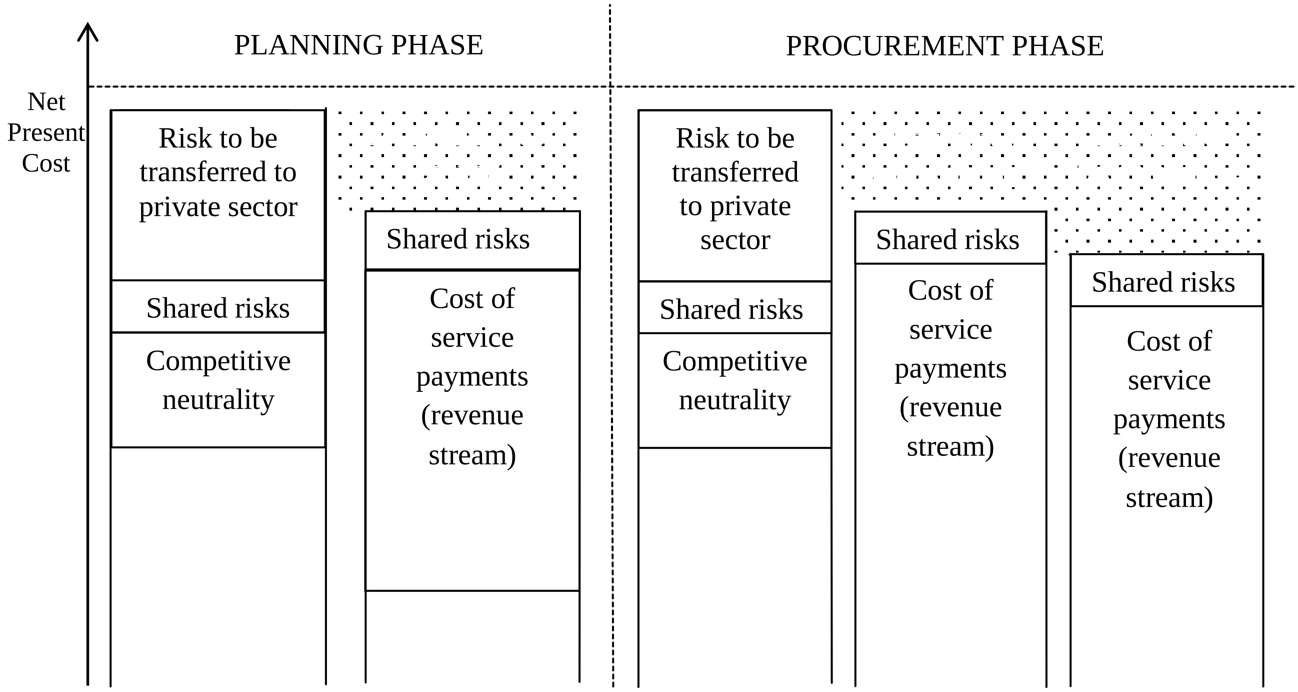
2. Value for Money Principle Implementation

An obvious, but important aspect of P3 success is to adopt and implement a value for money (VfM) approach. VfM evaluates total project costs and benefits using a Public Sector Comparator (PSC) to estimate life-cycle costs and, ultimately, asks if a P3 offers better value for money in comparison to traditional project delivery. Among these, life-cycle costs include operations, maintenance and improvements for public project delivery and can offer a comparison between P3 bids (Rall et al., 2010). Figure 7-1 offers an analysis of VfM using a PSC and compares the net present cost of a project using a PSC and P3s. During the procurement phase engaging in a P3 offers substantial benefits and does offer better VfM than traditional delivery. However, P3 Bid 1 offers greater revenue streams but less costs savings while Bid 2 offers greater cost savings but less revenue streams.

In 2009, Brown et al. performed a study that focused on the international P3 experience; they found that the United Kingdom has been successful using a VfM approach when selecting their P3 projects; by asking if a project has sufficient scale to offset transaction costs, if the public sector can define its needs and services, if the private sector has the appropriate experience and whether or not there are appropriate performance measures for private sector assessment. The United Kingdom determines whether or not VfM is possible and thus plans the projects accordingly (Brown et al., 2009). The establishment of similar criteria would aid West Virginia in determining whether or not a particular project offers a tradeoff between the values that the state desires and the overall costs of the project. Typical VfM assessment includes ensuring that the optimum allocation of risk is being transferred, what factors were taken into consideration during contract creation and proper management of the scale and complexity of the project (Cobey, 2009). Other important aspects that will ensure VfM include the evaluation of proposals, transparency, disclosure and standardized agreements (Abdel Aziz, 2007).

[8] HUD-DOT-EPA Partnership for Sustainable Communities
http://www.epa.gov/smartgrowth/partnership/index.html

Figure 7-1 Value for Money (VfM) Analysis Using a Public Sector Comparator (PSC)



Source: Rall et al., 2010

3. Determine Appropriate Risk Share

The ultimate goal of any P3 is to transfer the project risk to the party that is best able to control and manage it (Abdel Aziz, 2007). The public sector wants good value for the money. In conventional government procurements, the public sector entity assumes most of the risk associated with projects. In P3s, the risk is distributed between both the private and public sector partners. The major facilitators of risk in the development of the KCH include land acquisition and design, technical and environmental, construction, utilities, operations and maintenance and traffic risks (Grimsey and Lewis, 2005).

Land A... Design Risk

Sustai... ersified master land use pl... public and private entities to select the land, on a parcel by parcel basis, bes... nining investment and the KCH devel... MP ... if a... C... r ... ce is obt... ain ... se P3 ... ri... us ... in complianc... propri... s an ... rough roadbeds are the foundation for future pavement structure and shoulders of the KCH and I-73/74.

Top quality in all aspects of the creation of roadway is to be expected and contracts need to include the appropriate provisions to guarantee quality of the rough roadbed, avoid land slips or slides as well as providing ease for future development and eventual usage. Incentives should be offered to require the private entity to design and construct the roadway with stringent standards while keeping the future of the segments in mind.

Technical & Environmental Risks

Some believe that P3s allow private entities to choose less costly and less environmentally friendly construction and maintenance methods (Rall, Reed and Farber, 2010). However, the process of surface mining forces a mining company to follow a strict and rigid set of environmental standards pertaining to water quality, water runoff and maintaining security for many animal habitats. Therefore, the private partner should be the sole entity responsible for environmental compliance and regulation risk. Mining companies possess the necessary knowledge and experience in applying for all surface mining related permits and should follow the permitting process through to the end. By converting the post mine land into roadbed, instead of following the typical reclamation processes, the mining companies are able to cut costs and save capital so they should be willing to assume any aspects of environmental risk.

Through past surface mining efforts, the companies are familiar with efforts to restore mined areas. The required processes—including clearing, grubbing, seeding and mulching—will be necessary in areas surrounding I-73/74. The mitigation process must meet standards as established by the United States Environmental Protection Agency (EPA) and the United States Army Corps of Engineers (USACE); just like environmental requirements, the mining companies are well versed in proper mitigation techniques and should be expected to assume these responsibilities.

Utility Risk

Utility corridors, areas designated by federal, state, and/or local planning agencies as suitable for existing and future utility infrastructure, are essential to economic development along the I-73/74 NHS Corridor. As shown in the Buffalo Mountain MOU, CONSOL has agreed to relocate the utilities in accordance with the WVDOH manual regarding accommodation of utilities on highway projects. CONSOL also agreed to provide easements necessary for utility development along the route of the Buffalo Mountain project (WVDOT, 2007). If no utility corridors are in place, future contracts should distribute the utility risk to the mining company/private partner so that the utilities are in place or ready for immediate development once construction of the actual roadway begins.

Operation & Maintenance Risks

In most P3s, the private entity is responsible for the development and building of the project, assumes the risk of operation and maintenance and often continues to operate and manage the project upon completion, resulting in much longer contract periods. This enables the private

entity to take advantage of potential tolling or other income generating activities for an extended period of time. However, the KCH is a different situation as the mining companies will be absolved of operation and maintenance responsibilities once the roadbed is completed and donated for further construction.

The WVDOH has successfully managed the state's roadways and should be prepared to assume the risk of operating and maintaining I-73/74. Unless roadway operation is specified in the agreement, future P3s will require the WVDOH to continue to operate and manage newly created sections of I-73/74.

Traffic Risks

Traffic risk exists for both tolled and untolled highway infrastructure and is not eliminated once the roadway is complete and put into service. Traffic risks include changes in traffic patterns, volume/congestion, timing and traffic mix as well as the impact that maintenance, weather and accidents has on daily traffic (Prieto, 2009). Additional traffic studies will assist in mitigating these risks for segments of the I-73/74 NHS Corridor as strategic plans for market-driven economic development progress. As new industrial parks develop, such as the Indian Ridge Industrial Park in McDowell County near the intersection of the Coalfields Expressway and the KCH, accurate forecasts of commodities transported to and from markets by truck will become increasingly important. As the I-73/74 NHS Corridor improves accessibility to southern West Virginia population centers throughout the East Coast, quantifying the higher traffic volumes will benefit the travel and tourism industry. The new roadway can provide ample passing zones for increased truck traffic and improve safety, while reducing travel time, fuel consumption and environmental emissions.

4. Develop a Standard P3 Contract

As a portion of the "I-73/74 North-South Corridor," the contracts regarding the KCH and any other potential segments must incorporate a timeline as required by the completion date of the entire "North-South Corridor." However, the period, as decided upon by the state and private entity, must be reasonable while meeting the needs of both parties. Each party should be aware of all project requirements in advance and will agree upon a timeline while establishing project milestones to monitor the progress as well as the time and costs required to complete the project. The contract must provide a supportive framework in order for each entity to operate in a spirit of partnership, making it possible to find solutions to issues as they arise (E&Y, 2008).

5. Maintain Contract Flexibility During Project

Flexibility will allow both the private and public entities to handle unexpected issues and minimize project lag while keeping costs under control. Contracts should include the right to renegotiate or modify while work is in progress.

The creative P3 approach to the KCH allows greater flexibility in management of the partnership. Brown et al. (2009) defined contract management into three distinct roles: performance monitoring, financial monitoring and contract administration. Performance management—including formal audits, site inspections or spot checks of the project—is paramount in P3s. Financial monitoring involves an analysis of traffic data, distribution of bonuses/enforcement of deductions, on time monthly payments and an annual reconciliation. Contract administration activities, the main part of the procurement process, begin when a contract is awarded, end when a project is terminated or completed, and determine if contractor performance met requirements.

6. Define Clear Contract Management Roles

Proper role definition can create a cohesive team between the private and public entities. If the relationship ends or becomes weak the P3 arrangement can become more restrictive and essentially morph into a traditional service contract and method of project delivery (E&Y, 2008).

The Red Jacket and Buffalo Mountain contracts can provide excellent examples of proper P3 management. Review of the contracts can assist in implementing proper partnership management techniques, such as inspections and project progress. For example, both the CONSOL-Buffalo Mountain and the ANR-Red Jacket agreements require a high level of performance and occasional inspections of the project sites. As required by the Red Jacket agreement, ANR must provide a projected construction schedule to the West Virginia Department of Transportation (WVDOT), which is to be continuously updated and used for periodic inspections by the WVDOT. This allows the WVDOT to play a key role in the construction of the roadway even though ANR is responsible for the actual work. Should any issues arise, there is enough time to properly address them before the rough roadbed is finished and handed over to the state for completion of the KCH (WVDOT, 2004). The inclusion of provisions that allows the public entity the right to inspect the progress, materials used and overall condition of the project is an excellent way to ensure equal management in the partnership.

The Red Jacket and Buffalo Mountain sections of the KCH require little to no financial backing from the state as each contract provides that the mining companies are responsible for the costs for resources used in the grading of the land. These resources include tools, materials, labor and any other components crucial for the completion of the grading. Some costs, such as sub grade materials, are designated as reimbursable; the WVDOT has accepted responsibility for covering an established percentage of these materials.

7. Establish Performance Measures and Key Performance Indicators

Performance measures can be used to base incentives or penalties levied upon the private entity. Accurate analysis of performance can only be obtained after the appropriate Key Performance Indicators (KPIs) are determined and monitored (Yuan et al., 2009). Typical performance

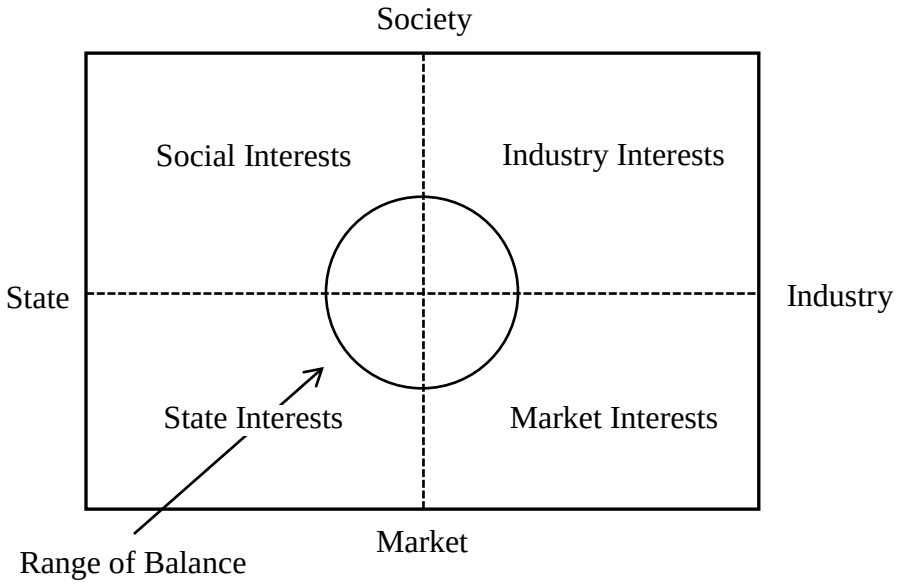
measures that are heavily emphasized include safety, quality, budget maintenance, on-time completion, risk transfer and economic development. KPIs lack value unless they can be measured to ensure progress and performance. For example, Spain has created a KPI to measure safety of constructed highway infrastructure. The accident rate is calculated using the number of accidents with victims, length of highway and the average annual daily traffic. The accident rate is then compared with the previous year's rate, an increase results in a penalty to the private partner while a decrease results in a bonus of the annual service payment (Brown et al., 2009). Using these factors to quantify the performance of the highway infrastructure allows Spain to determine where any issues may lie and what steps are necessary to implement improvements.

Current and future P3s regarding the I-73/74 NHS Corridor must establish performance measures that can be quantified by using KPIs. The KPIs can be used to guarantee an accurate analysis of the projects and answer any questions on progress and improvement areas. KPIs that estimate and predict the regional economic impacts surrounding the corridor as well as reliability, project timing, safety, maintenance and carbon emissions will be particularly valuable.

8. Establish a P3 Equilibrium Framework

Garvin and Bosso (2008) analyzed the effectiveness of P3s as infrastructure development strategies and presented a framework in order to structure and assess P3 programs. The long term success of a P3 program depends heavily on establishing a balance between the state, society, industry and market (Figure 7-2).

Figure 7-2 P3 Equilibrium Framework



Source: Garvin & Bosso, 2008

Using the equilibrium framework creates boundaries for the overall P3 program and provides a platform for plotting the general location of each project while evaluating the program's

evolution. Scope of work, financing, user fees, acquisition/procurement, contract management, market conditions, socio-environmental conditions and project performance are among the elements that are estimated during program appraisal.

Using the P3 equilibrium framework to assess potential P3s, and ensure the correct delivery method, would be extremely beneficial. This framework was used for several case studies, including the SR91 Express Lanes in California. In December of 1995, a four lane toll road was opened to develop, finance and operate transportation projects with the California Private Transportation Company (CPTC). After a series of disagreements involving additions to the roadway a legal battle ensued to determine whether or not the suggested improvements were necessary or would violate the noncompete clauses. The SR 91 Express Lanes Franchise was eventually sold to the Orange County Transportation Authority who then entered into a second operating agreement for $6,160,170 per year. Using the P3 equilibrium, it was found that the SR 91 Express Lanes project was successful as it improved the quality of service and introduced a time/cost choice to the traveler in a timely manner. The impacts of SR 91 were estimated based on several issues: established demand, competing facilities, manageable global risks, project scale, user fees, public and political support, finances, selection criteria, risk apportionment, performance measurement, quality, innovation, price and environmental performance. Most of the results are not quantifiable numerically but all aspects of the project's performance were factored into the equilibrium (Garvin and Bosso, 2008).

Implementing the P3 equilibrium framework to evaluate immediate solutions with long term benefits for future portions of the I-73/74 NHS Corridor could help achieve synergy between the competing interests and maximize project performance in predominantly rural counties. Table 7-1 shows a summary of recommendations for future P3s in the state of West Virginia

Table 7-1 Summary of Recommendations for Future P3s in West Virginia

Recommendation	Description
1. Project Selection	Select projects that provide significant economic benefits, facilitate I-73/74 completion, and support the HUD-DOT-EPA Partnership for Sustainable Communities as well as reducing flood risks and improving health care services for areas with a high percentage of older residents.
2. Value for Money (VfM) Implementation	P3 projects should have sufficient scale to offset transaction costs. Maximizing value while minimizing costs are the goals of successful P3s. Implementing a value for money approach makes this possible by evaluating total project costs and benefits by using a Public Sector Comparator (PSC) to estimate life-cycle costs which are much higher due to the rugged terrain in West Virginia.
3. Determine Appropriate Risk Share	Risk should be transferred to the entity that is best able to control and manage risk. *Land acquisition & design risk* should be shared between both the state and the private entity in order to guarantee the roadbed meets the needs of future highway construction. Locations for potential warehouse/distribution centers should be identified as well as potential locations for new service businesses to support increased traffic and tourism from adjacent states. *Technical & environmental risks* can be mitigated by using the experience and expertise gained by past surface mining projects. The mining company is best suited to assume these risks, as well as mitigation of the surface mining site to reduce geohazards such as flood risk, slips and slides. *Utility risk* should be distributed to the mining company as they will be able to relocate the utilities already established and providing easements for future utility locations. Utility corridors should be constructed to stimulate economic development and support new industrial parks at important interchanges, new service businesses, airports, hospitals and consolidated schools. *Operation & maintenance risk*, as well as *traffic risks*, will be the responsibility of the state as contract provisions will require the mining company to transfer the roadbed after all coal has been extracted. Tolling should be considered as a flexible funding mechanism to support improvements and general maintenance. The state should determine the viability of PMLU transportation options to advance corridor construction through ongoing dialogue with stakeholders to identify needs and customize solutions.
4. Develop a Standard P3 Contract	Using previous KCH P3 contracts, a standard contract should be developed clearly outlining technical requirements which will establish milestones and timelines for the project to follow. Vendors must detail the time and costs required to complete the project.
5. Maintain Contract Flexibility During Project	P3 projects last for a number of years; unfortunately, conditions can change dramatically and further negotiations may be necessary to adjust for these changes. Maintaining flexibility allows the public and private entities to adjust or renegotiate without any performance issues or

	contract default should the project scope grow or unforeseen circumstances occur.
6. Define Clear Contract Management Roles	A review of the Red Jacket and Buffalo Mountain projects could assist in future I-73/74 P3 endeavors. The contracts used for these projects clearly define the objectives, duties of each party and provide the framework necessary for a successful partnership. Clear and open communication will be required during all phases of the partnership.
7. Establish Performance Measures and Key Performance Indicators	Performance measures are used to base incentives or penalties. Determining a way to quantify performance measures—such as safety, quality, budget maintenance, on-time completion, risk transfer and economic development—would be very beneficial to P3 projects and analyses. KPIs that could estimate the reliability and carbon emissions of I-73/74 are of interest and would be extremely valuable.
8. Establish a P3 Equilibrium Framework.	A successful P3 must create a synergy between factors and balance among state, society, industry and market stakeholders by using transportation criteria to demonstrate the I-73/74 NHS Corridor will improve public transportation safety and public services infrastructure. Factors such as scope, financing, user fees, acquisition/procurement, contract management, market conditions, socio-environmental conditions and project performance can be estimated to determine if the equilibrium framework is complete.

Source: Brown, et al., 2009; Carpenter et al., 2003; Grimsey and Lewis, 2005; PECC, 2006; Prieto, 2009; Garvin and Bosso, 2008

Prioritization

The goal of SEP-15, a new approach to contracting for infrastructure projects, is to encourage the private sector to participate in highway infrastructure projects while fostering innovative alternatives and approaches to the project development process. The Red Jacket and Buffalo Mountain sections of the I-73/74 are using a new and highly innovative P3 delivery method that provides tremendous cost savings to the state and the coal companies. Of the four main goals of SEP-15, the coal reclamation process meets three: contracting, right-of-way acquisition and project finance. Compliance with environmental regulations is the fourth and future work must be done to streamline and improve the ability to meet these regulations. Obtaining support by the FHWA could potentially allow quicker environmental permitting, which has been a chief cause of concern for surface mining projects in West Virginia.

The completion of I-73/74 will bring enormous economic benefits to the state of West Virginia through an increased volume of business and travel related users, providing opportunities for other forms of economic development. The TIFIA program was designed to offer credit assistance to projects that are of regional and national significance. Designated as a high priority corridor of the National Highway System, I-73/74 can play a key role in regional and national development. As work progresses on the KCH and other sections of I-73/74, the use of a P3 is

encouraged and the TIFIA program should be offered as an incentive for the private entity to assist in funding.

The private sector stands to benefit immensely by developing and operating transportation infrastructure projects; private activity bonds can be an excellent way to fund these operations. Regardless of delivery method, private activity bonds provide incentives and significant tax breaks to a private entity participating in a P3 to develop future sections of I-73/74. These bonds could be used in conjunction with surface mining projects or the designing and building of a toll plaza or roadway.

Establishing a SIB in West Virginia would allow the state to fund much needed improvements in transportation infrastructure while still maintaining the power to set credit requirements, loan terms and project limitations. Future transportation improvements and construction that are not related to the I-73/74 NHS Corridor would benefit from a SIB and the services it can provide. With an SIB the interest rate is set by the state, the maximum loan term is 35 years, the state may be willing to take more risk than a commercial bank and a SIB can make a large project more affordable than it would be without these advantages. For example, a $500,000 project could be financed with a ten year 6 percent loan with annual payments of $41,000 (West Coast Collaborative, n.d.). Unfortunately, a SIB would take a considerable amount of time to fully recognize the benefits of its establishment.

Finding private entities that would be interested in designing, building and potentially operating a roadway could be a difficult task. However, the state can emphasize the benefits of funding I-73/74, by implementing a pass-through, or shadow tolling arrangement. A 17-20 percent increase in VMT is estimated in this study and implementing this fee based on the number of vehicles or vehicle miles could generate substantial capital. Availability payments ensure accurate and timely completion of a roadway. They also offer greater benefits to toll facilities that aren't expected to generate much revenue.

Other P3 Opportunities in West Virginia

The use of a P3 can assist in creating a number of opportunities for the state of West Virginia. Past studies on projects—such as the Texas State Highway 130 and the Chicago Skyway—have shown success. These opportunities are not limited to the use of post mine land but can encompass a variety of projects, such as roadway construction and much needed improvements in highway infrastructure.

Engaging in P3s to lease portions of a roadway has shown to be a feasible way to raise capital and funding for transportation projects. The use of these arrangements has been shown to provide benefits to the public entity while maintaining an overall success rate. For example, the City of Chicago requested potential bidders for the operation of the Chicago Skyway. After a

bid of $1.83 billion for the 99 year concession, the Skyway Concession Company, LLC (SSC) assumed operations on the Skyway, thus creating the first long term lease of an existing toll road in the United States. The money obtained from this scenario funded a $500 million long-term and a $375 million medium-term reserve for the City of Chicago, in addition to a $100 million neighborhood human and business infrastructure fund to be drawn down over five years (FHWA, 2011h).

If West Virginia opts to enter into a long-term lease agreement or contract that includes tolling, the state should be expected to satisfy several noncompete provisions. The private entity will want to mitigate against any potential competition from other future roadways or transportation infrastructure. In the aforementioned Texas DOT State Highway 130 plan, the noncompete provision required Texas to compensate the private entity for loss of revenues resulting from new construction; however, projects on existing transportation plans are exempt (GAO, 2008). Noncompete clauses could prove to be a non-issue for the state considering the lack of available funding and likelihood of securing funding for future transportation projects.

Additional I-73/74 P3 Opportunities

The P3 possibilities vary based on each county's location, as well as accessibility to transportation systems in adjacent counties and states, and the ability to provide proper utilities, such as water, sewage, and fiber-optic cable for network systems. Currently, several sections of the I-73/74 NHS Corridor are without any direction or a tangible plan to provide for construction and completion. Only the Red Jacket and Buffalo Mountain projects have begun or are awaiting permits, leaving large gaps in the overall progress of the corridor.

Mingo and Logan provide the greatest amount of potential development and are able to draw from their past PMLU experience for future projects. Manufacturing, distribution centers and industrial parks are possibilities for both counties. Master-planned communities, such as Charles Pointe in Bridgeport, WV, can provide substantial residential, commercial and retail options; and perhaps locations along the corridor could explore these as an option. Smaller scale residential PMLU could include housing developments or town houses similar to Southridge, the former mine site in McDowell County that is being converted into 32 residential homes (Wood, n.d.). Including recreation activities in PMLU, such as the addition of trails and the development of the motor sports complex in Mingo, could provide an economic impact to these counties.

The geographic layout of both Wyoming and McDowell Counties make it difficult to develop potential projects in conjunction with the KCH. However, entrepreneurs often use land unsuitable for industrial, commercial or residential sites to foster economic development. With an abundance of undesirable land, and a population that would not be able to support industrial, commercial or residential development, creativity must be used in future development. Agritourism activities— such orchards, vegetable picking, horseback riding, vineyards, cheese making or beekeeping—make for viable options in these geographically and economically

challenged areas of West Virginia. Converting post mine land into aquaculture areas or recreation areas, complete with trails and other forms of outdoor activities remains as options as well. Potential agricultural financing provided by the state or the United States Department of Agriculture should be explored.

The Hatfield-McCoy Trail system has created the need for more restaurants and lodging in the Wyoming County area; however the lack of roads, water, sewage, funding and available land creates problems for development. As of March 2011, plans for a convenience store and several restaurants in Pineville were underway but eighty-five percent of the county is owned by land-holding companies which puts a burden on economic development (Brooks, 2011). With the development of the I-73/74 NHS Corridor, The Wyoming County Strategic Plan has forecasted several positive economic development impacts. Among these include personal income annual growth rates of 4.8 percent in 2002-27, total employment growth of .2 percent in 2002-27 and non-manufacturing employment annual growth of 0.2 in 2002-27 (Terrell Ellis & Associates, 2010).

Mercer County is similar to Wyoming and McDowell Counties in that there is a lack of quality land and a shrinking economic base. However, without any reclaimed mine sites along the route, the county must use other areas of developable land which are available. The Mercer County Airport provides an opportunity for a possible air-transportation park, as well as a potential intermodal facility due to access to both rail and air transportation. Currently, the City of Bluefield is seeking funding to create the Colonial Intermodal Center in downtown Bluefield, which would provide access to bus lines and passenger-rail, as well as hotels and other businesses (Owens, 2011). Agritourism and recreation also provide options for Mercer County to consider. According to the West Virginia Commissioner of Agriculture, agritourism vacations benefit the state's economy and assists in keeping farmers on the farm.[9] The West Virginia Farm Bureau has recommended that the state focus on attracting agricultural processing industries as well as develop private and public facilities to promote equine industry growth with a focus on educational programs, activities and tourism (West Virginia Farm Bureau, 2011).

P3 Opportunities for Further West Virginia Highway Infrastructure

Located on the western most portion of KCH, the West Virginia 65 corridor, Williamson Connector and 5 mile section spanning the distance between the Buffalo Mountain Project and the Red Jacket Project are currently without plans for completion. The Buffalo Mountain and Red Jacket projects encompass approximately 22 miles, leaving over 70 miles of the KCH left to complete. The obvious preference for completion of the remaining mileage would be to establish a P3 similar to those already underway. The process of turning post mine land into rough roadbed presents more benefits with less cost to both the state and the mining companies. However, coal seams may not be located along the designed route of the I-73/74 NHS Corridor.

[9] http://www.wv.gov/news/Pages/AgritourismProvidesthePerfectAntidotetoStaleSummerVacations.aspx

If no options for surface mining exist in any of these locations, the state may choose between options which include *design-build-operate-maintain*, *design-build-finance-operate*, *a long-term lease* or *build-operate-transfer* P3 project delivery arrangements, all of which have been discussed in Chapter 2.

In addition to using P3s for the I-73/74 NHS Corridor, there are several open or potential highway projects in West Virginia that can enhance the state roadways and transportation system. They include Grafton's Bridge Street Bridge, US 35 between Beech Hill and Pliny, WV and the WV 705 Connector located in the Morgantown area.

With small populations in many rural areas, low traffic volume and short routes make P3s difficult for the majority of transportation infrastructure improvements in West Virginia. In order to gauge interest from outside parties, the benefits must outweigh the costs. Of the potential WVDOH projects, the traffic volume of the Bridge Street Bridge in Grafton, WV could increase interest from private entities. Traffic data collected in 2009 show average daily traffic (ADT) of 4,000 cars with a projected growth of 2,100 cars over the course of the next 20 years (WVDOT, 2010a). Adding a toll to either the entrance or exit of the bridge could bring in a substantial amount of money per year.

The future completion of the last 14 mile gap section of US 35 between Beech Hill and Pliny, WV has been a topic of debate and discussion in our state. Plans to complete the four lane roadway were suspended on March 2, 2011 when a bill that would set aside $8 million of Infrastructure Development funds each year that would guarantee $110 million of toll road bonds was defeated. A DOH spokesman, has publicly commented that the project is not officially dead, but any financing options would be considered (Kabler, 2011). Engaging in a P3 would be ideal for bringing this project to fruition and would enable the state to complete the roadway. The use of a P3 would allow the state to avoid assuming the large amount of debt that would come along with the distribution of toll road bonds. One of the main issues with prior proposals for WV35 included the implementation of tolls; the use of a P3 would more than likely guarantee the roadway as a toll road. If the state could provide information to current US 35 users showing the potential benefits of a P3, public support could be generated and the roadway could be completed.

Another significant opportunity for additional P3s in West Virginia involves the WV705 Connector project. This project is designed to relieve traffic congestion, improve safety and provide better access to and from the Morgantown area. This would involve converting a 2 mile section of WV705 into either a four-lane highway, five-lane highway or a combination of both. Total costs for a five lane conversion total $42,900,000, while four lanes will cost the state $38,200,000. Both of these estimates include right of way, construction and utility costs (WVDOT, 2010b). This project is suitable for a P3 project delivery and would allow much needed road upgrades to be made with little cost to the state. Although the total costs are rather

high, a private entity would be able to recoup the costs by designing, building and operating a toll plaza. Setting up a P3 similar to the State Highway 130 project in Texas could not only assist in the completion of this roadway, but could also provide substantial financial benefits to the state. An upfront payment and toll sharing for a specified amount of time would allow the state to obtain capital to further future highway infrastructure or provide funding for other important projects.

I-73/74 has shown that creative opportunities for P3s exist in West Virginia. The desired method of delivery is to use post mine land for rough grade roadbed; however, other options do exist. Finding a private entity willing to assume the financing, building and operation roles of a highway/toll plaza can aide in furthering the state's transportation system.

Guide Actions and Conclusion

Federal legislation allows federal funds to be mixed with private funds; the use of P3s is becoming a common method of transportation project delivery (Rall et al., 2010). Potential projects should be selected based on the needs of the state and, ultimately, satisfy the requirements of the state transportation plans. We offer the following feasible actions to the WVDOT when considering P3s and/or financing for future highway transportation project needs.

STEP 1: A dedicated P3 project team/task force for all future transportation projects is suggested. The team should consist of individuals familiar with laws/requirements, technological aspects and possess adequate business knowledge. The task force will be responsible for selecting, monitoring and assisting with potential and current P3s in the state. During the selection process, private entities should be evaluated and selected based on their experience and knowledge of the project (PECC, 2006). Examples of already established teams/agencies may include the National I-73/74 Corridor Association, the Office of Coalfield Community Development and the King Coal Highway Authority.

STEP 2: The WVDOH should encourage and assist the state in the establishment of a SIB. These have been successful in other states and would allow many West Virginia Title 23 highway construction projects to receive funding. Supporting other legislature and funding initiatives that will encourage and facilitate the use of P3s for highway infrastructure is recommended.

STEP 3: Transportation and non-transportation related projects should be analyzed and prioritized based on state needs. Once priority has been determined, the state can shift funds to projects that will have a direct economic impact and determine whether any federal matching programs exist. This will allow the state to shift funding to areas of greater needs. Establish long term strategies to diversify the local economy while

realizing that not every tract is rich in coal deposits or suitable for large-scale industrial development.

STEP 4: Innovative financing tools and programs as discussed in Chapter 6 are viable options in completing the I-73/74 NHS Corridor and should be utilized. In conjunction with P3s, federal-aid matching programs and public-private finance mechanisms such as tolling or availability payments could provide the required capital to ignite future construction of the roadway. However, significant potential may lie in the TIFIA program and the use of GARVEE bonds for future corridor development. The TIFIA program offers flexible repayment terms and attractive interest rates, much lower than conventional rates and can provide up to $10 in credit assistance for each dollar of Federal funds. GARVEEs offer the convenience of accelerated construction and the ability to spread costs over the useful life of a transportation facility rather than just during the construction. GARVEEs are appropriate for large, long-lived, non-revenue generating assets such as roadways.

STEP 5: Transparency, or the attributes of the procurement process that makes it stable, reliable and predictable to the participants, as well as the legislature, officials and the public, is fundamental to the acquisition of public services or works. As P3 projects increase in scale and complexity, public interest increases exponentially. Elected officials, the media and private entities are hesitant to become involved in projects that put their funds at risk (Brown et al., 2009).

STEP 6: P3s for highway infrastructures have the ability to provide needed economic benefits in addition to overall improvements in travel time and roadway safety. All of these benefits should be effectively communicated to outside parties, particularly the public. Keeping the public informed of the I-73/74 progress, obtaining feedback and increasing public support are all paramount to successful completion of the roadway. A "fact sheet"—or another form of an informational document that explains the public benefits, the funding sources and the effects the project—will have on tax payers should be distributed before any project is started and continue through the project development phase. Society has become more dependent on computers and electronic distribution of information and a website monitoring progress could be used to keep outside parties informed of any updates.

STEP 7: Seminars, workshops, conferences and town hall style meetings can be beneficial during the creation of I-73/74 (Carpenter et al., 2003). Involving state and local agencies, such as the West Virginia Department of Energy, local economic development agencies and post mine task forces, is highly encouraged and would give the public an opportunity for immediate answers to their questions. Currently the Office of Coalfield Community Development assists counties with the production of their Land

Use Master Plan to use for post-mine development and the WVDOH has developed a press area on the KCH website for postings, news releases and other pertinent information regarding the KCH progress. Updates on the entire I-73/74 NHS Corridor could provide the public with additional information on other sections of the roadway.

Appendix I: Common Types of P3s

P3 Delivery Method	Project/Location
Design-Bid-Build (DBB)	Presidio Parkway Project - California
Design-Build (DB)	Triangle Expressway - Raleigh and Durham, NC.
Design-Build-Operate-Maintain (DBOM)	Las Vegas Monorail – Las Vegas, NV
Long-Term Lease (LTL)	Chicago Skyway – Chicago, IL
Design-Build-Finance-Operate (DBFO)	South Bay Expressway – San Diego County, CA
Build-Operate-Transfer/Build-Transfer-Operate/Build-Own-Operate (BOT/BTO/BOO)	Don Muang Toll way - Thailand

Appendix II: REMI Results Including WV 65

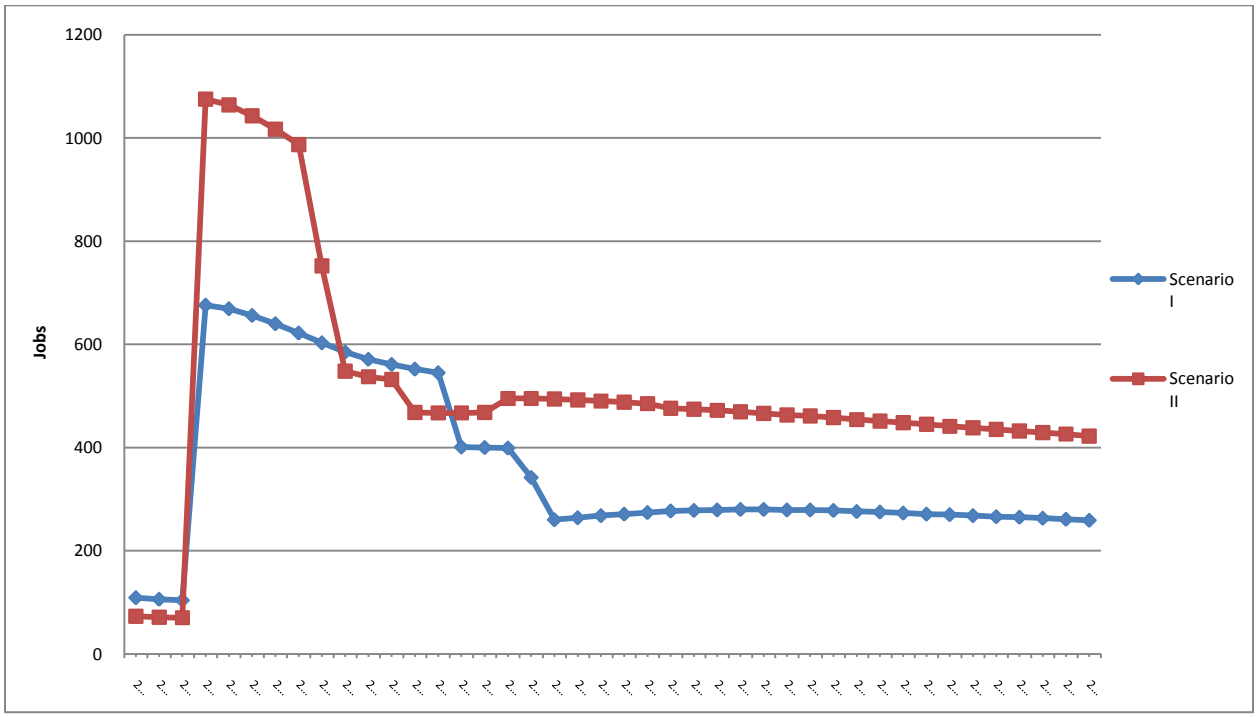
Using the REMI TranSight model short- and long-run economic impacts were estimated for each scenario but also including a 6 mile segment of WV 65 which will intersect the corridor. The economic impacts of the I-73/74 NHS Corridor (including WV 65) in the five counties from 2012 to 2050 are once again presented for four categories.

- Total employment
- Gross regional product
- Personal income
- Industry output

Total Employment

Figure A-1 shows the job creation of the I-73/74 NHS Corridor for the two scenarios. The results of both scenarios show that including a segment of WV 65 in our analysis provides a positive impact on total employment for all five counties along the corridor. In both scenarios, total employment peaks in 2012 when construction begins; 676 jobs for Scenario I and 1075 for Scenario II. As construction is completed, total employment gradually decreases until 2028 in Scenario I (264 jobs) and 2025 in Scenario II (495 jobs). At this point total employment begins to increase and remains relatively consistent, with no dramatic increases or decreases year over year until 2050 due to service industry employment increasing.

Figure A-1 Net Economic Impacts of the I-73/74 NHS Corridor on Total Employment (including WV 65)



The results once again show that construction peaks in the short-run when construction jobs are created in 2012 to construct the roadway (Figures A-2 and A-3). During this year construction peaks for both scenarios with an estimation of 542 jobs created in Scenario I and 828 jobs created in Scenario II. As construction is completed the estimates decrease each year until the years 2023 (Scenario I) and 2018 (Scenario II) when the decrease is coupled with an immediate increase in the service industry. In Scenario I 76 service jobs are estimated in 2023, an increase from 44 jobs in 2022. Scenario II displays a similar trend as construction jobs are estimated to increase to 87 jobs in 2018.

Figure A-2 Employment Impact by Industry Sector (Scenario I including WV 65)

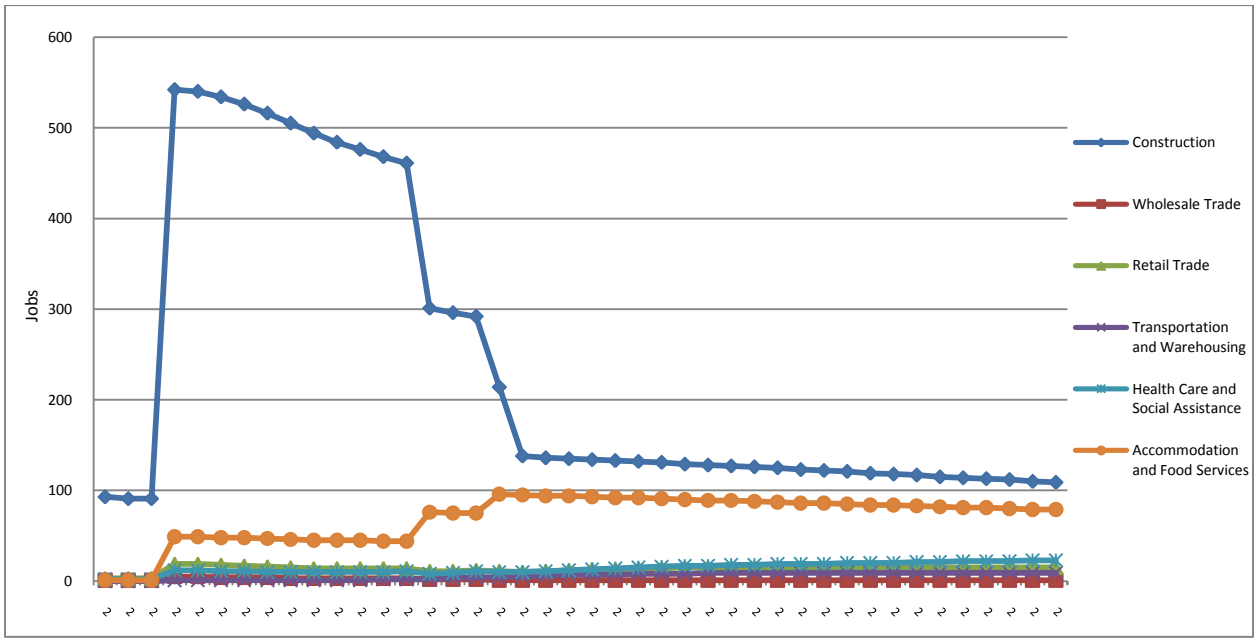
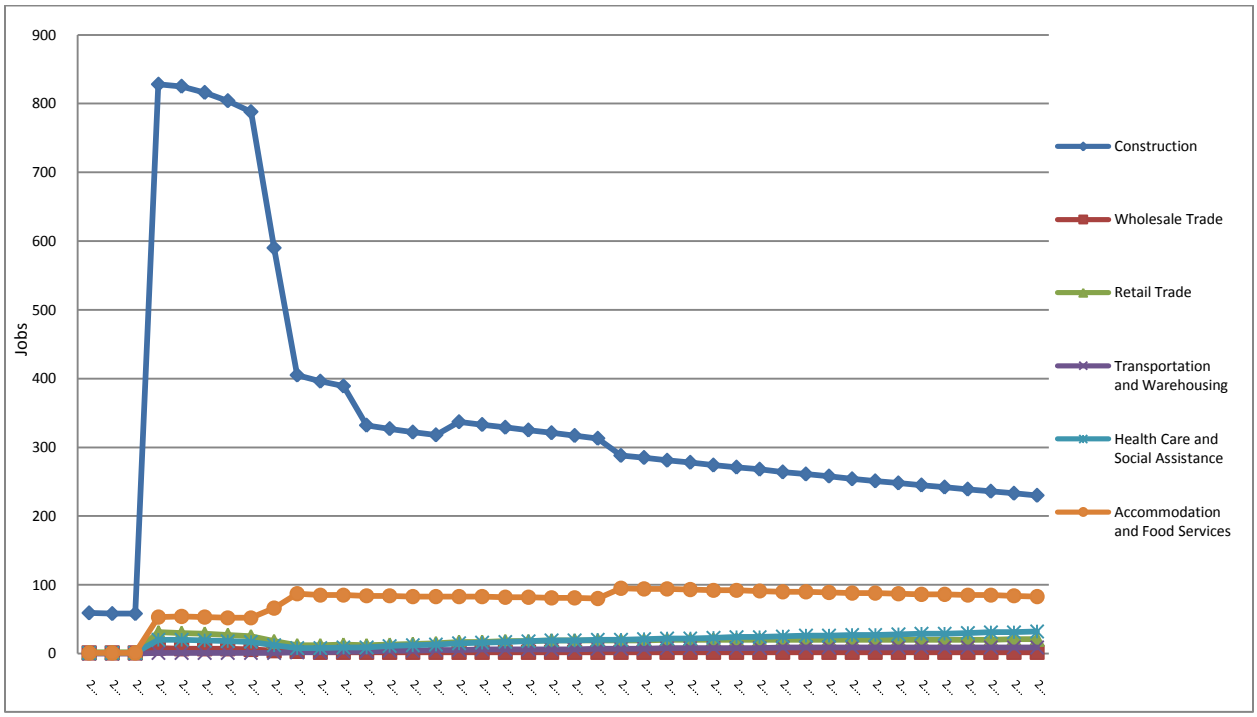


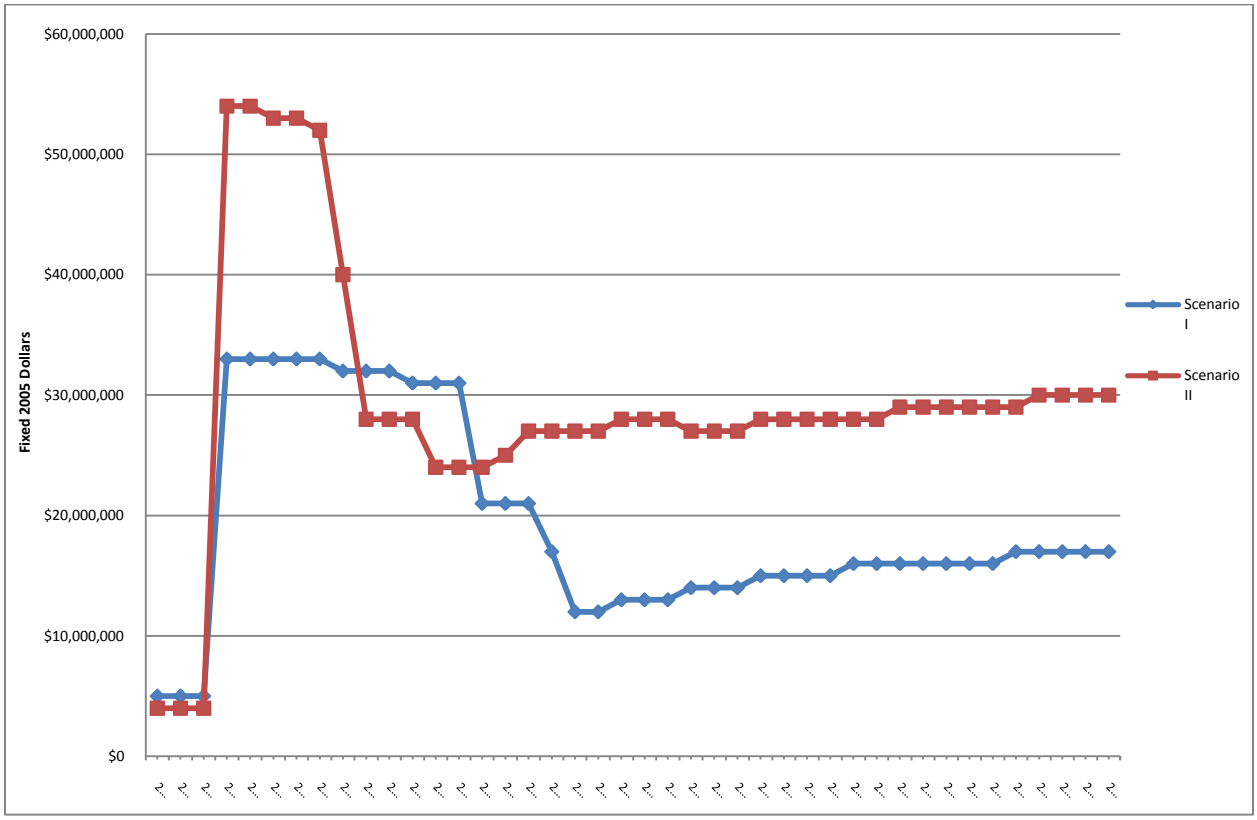
Figure A-3 Employment Impact by Industry Sector (Scenario II including WV 65)



Gross Regional Product (GRP)

As shown in Figure A-4, both scenarios provide positive economic impacts to the GRP of the five county region but Scenario II continues to display the trend of providing faster and greater impacts than Scenario I. In 2012, Scenario I GRP has been estimated at $33 million and $54 million for Scenario II. Using P3s offers a consistently and in most cases a substantially higher GRP during the 38 year study period other than between the years 2018 and 2023. During these years Scenario I offers a greater positive impact to the corridor but the long-run effects of Scenario II outweigh these impacts. In 2023 Scenario I GRP was estimated at $21 million while Scenario II provides an estimation of $24 million. GRP increases during the remaining years of the study period and in the final year (2050), Scenario I provides $17 million in economic impacts but $33 million estimated in Scenario II.

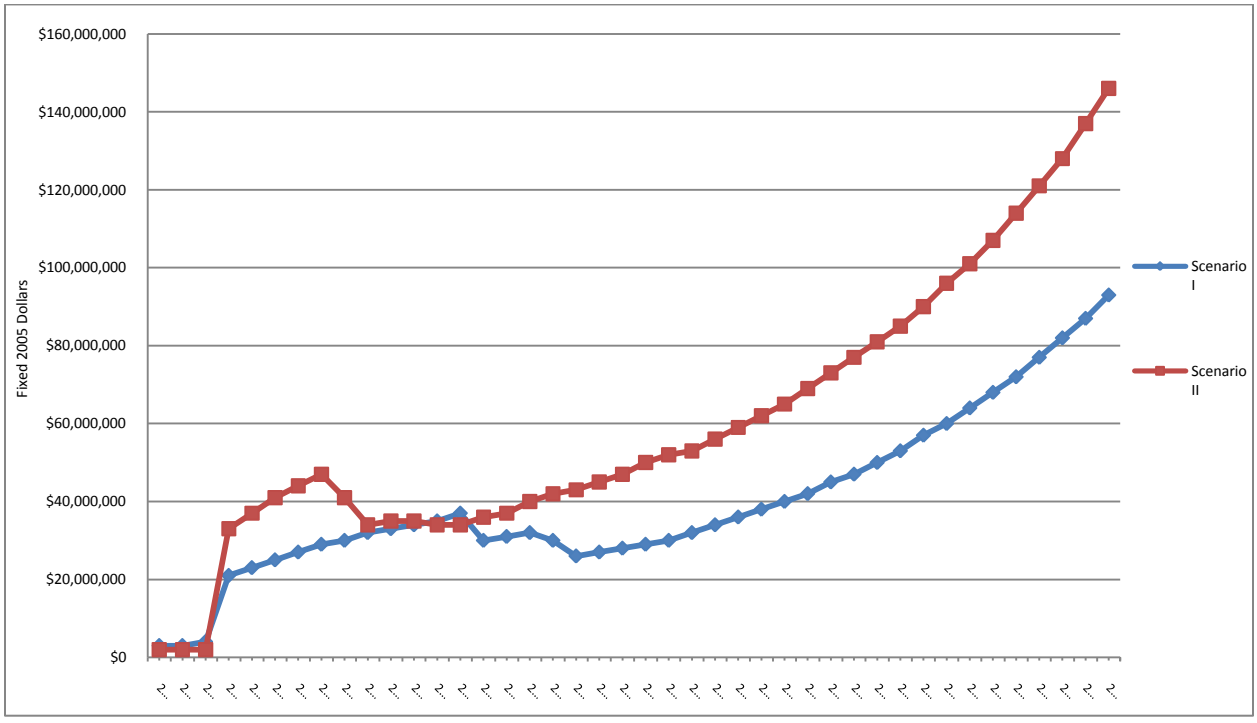
Figure A-4 Net Economic Impacts of the I-73/74 NHS Corridor on Gross Regional Product (including WV 65)



Personal Income

The construction of I-73/74 will positively impact personal income in all counties in both scenarios due to job creation, particularly in the construction and service industries (Figure A-5). In 2012, Scenario I personal income is estimated at $21 million and increases all years except for 2023 and 2027. After 2027, personal income is expected to increase each year and is estimated to reach as high as $93 million in 2050. As for Scenario II, has been estimated at $33 million in 2012 but decreases in 2017 and reaches its lowest point of the study period in 2021 when it falls to $34 million. Beginning in 2023 personal income begins a dramatic increase during each of the remaining years in the study period and is estimated at $146 million in 2050. The results indicate that while the long-run effects of each scenario on personal income are similar, the amount of impact varies greatly due to P3 usage.

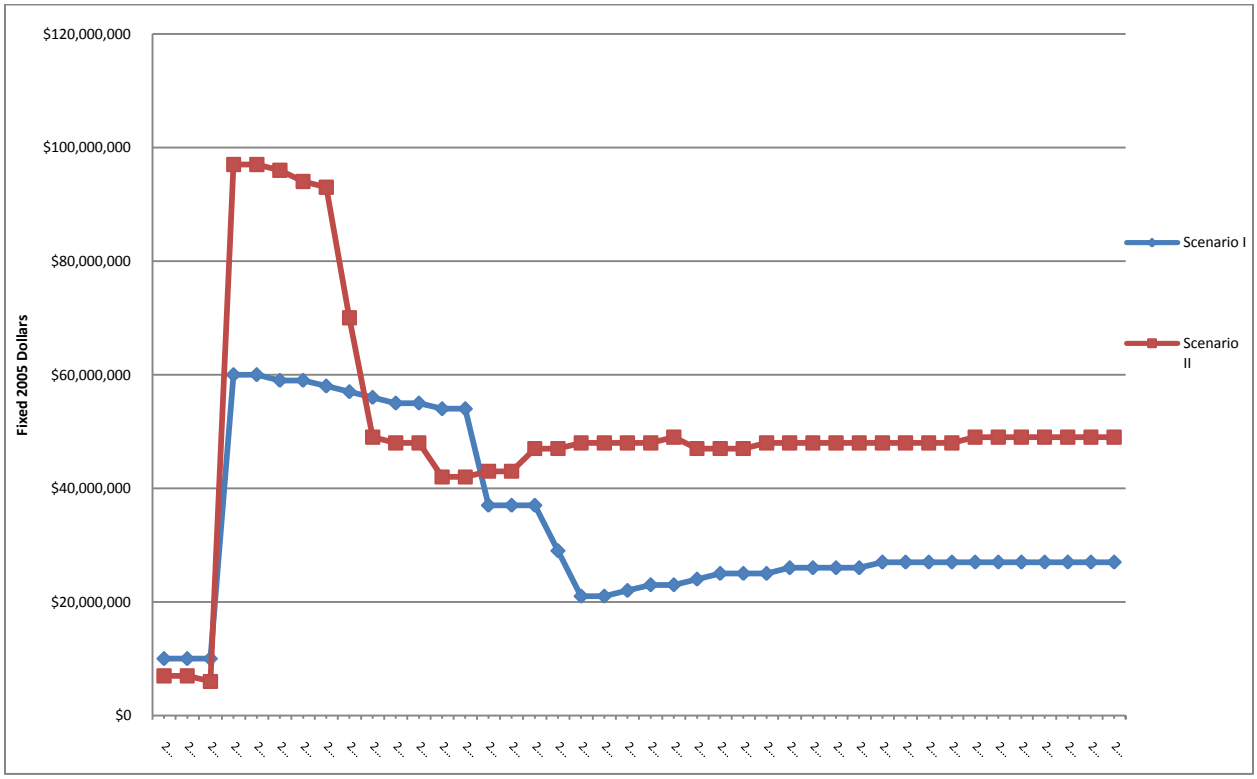
Figure A-5 Net Economic Impacts of the I-73/74 NHS Corridor on Personal Income (including WV 65)



Industry Output

Industry output results (Figure A-6) display a similar trend shown in the economic impact analysis in that Scenario II provides much greater estimated impacts than shown in Scenario I. In 2012 industry output will be high, due to increased construction jobs in the short-run ($60 million in Scenario I and $97 million in Scenario II). In the long-run, Scenario I output is estimated to be $21 million in 2027 and increases modestly year-over-year until 2050 when it reaches $27 million. Scenario II industry input is estimated at $43 million in 2024 and increases most years until 2050 when it reaches $49 million.

Figure A-6 Economic Impacts of the I-73/74 NHS Corridor on Industry Output (including WV 65)



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