



# I-80 Tolling Impact Study

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## INTRODUCTION

The proposal to implement tolls on Interstate 80 was borne out of legislation commonly known as Act 44. Residents of the Interstate 80 corridor and of the Northern Tier have testified during numerous public events that the plan will impose high costs on businesses and households located within the Interstate 80 corridor. Economic logic implies that it will have a negative impact on some residents of other parts of the state as well. Proponents argue in favor of tolls on 80 because they claim that most of the costs will be borne by drivers of vehicles from other states.

This report begins with an economic model of the impact of tolls on businesses and consumers. It identifies some of the major Pennsylvania industries that are likely to be affected by tolls and highlights the costs to people who work in those industries, workers who commute along 80, and consumers. Using information on industry location and goods shipments, it compares the effect of tolling 80 on different regions of the state. It also explores some of the indirect impacts of tolls. These include costs to state and local governments resulting from possible business closings, unemployment, and declining property values as well as the impact on highway safety of more cars and trucks traveling on secondary roads to avoid tolls on 80. This report also discusses the income distributional effects of tolls by comparing income and unemployment rates of the counties that will bear most of the costs of tolls with income and unemployment in the rest of the state and the Pittsburgh and Philadelphia metropolitan areas. Following this is a brief discussion of whether the benefits of tolls offset the costs. The study also discusses the debt the Pennsylvania Turnpike Commission (PTC) is incurring based on anticipated toll revenues from I-80 and how this debt and the costs of servicing it are likely to grow over time.

Although the Federal Highway Administration denied the state's request to impose tolls on Interstate 80 (I-80) last year, proponents are debating whether to reapply for tolling authority. Tolling continues to be an option that many politicians who live outside the Northern Tier and the I-80 corridor

prefer to alternatives, such as raising the gasoline tax or the personal income tax, for providing funding to fix roads and bridges and for state subsidies for mass transit. Thus, there is lively debate in the legislature and Governor's office about resubmitting the application to toll I-80.

## **HOW TOLLS ARE LIKELY TO AFFECT STATE RESIDENTS**

Interstate 80 has provided an expedited way for many businesses to transport their products to distant markets. Traffic from out of state or traffic between Pennsylvania and out of state locations is a significant source of income for many businesses located in counties adjacent to the Interstate. Interstate 80 is also important for intrastate travel and shipments, including a considerable amount of commuting.

According to the consultants hired by the Pennsylvania Turnpike Commission (PTC), Wilbur Smith Associates, the toll rate structure on Interstate 80 would be identical to the turnpike mainline, except that toll would be assessed electronically at specified locations along the highway rather than at exits. In the original proposal, projected tolls in 2010 were almost 8 cents per mile for a car and 31 cents per mile for a tractor and trailer with five axles (Wilbur Smith Associates, 4). Trucks with more axles would pay a higher toll with the rate increasing by almost 8 cents per mile for each additional axle. Tolls are scheduled to increase by 3 percent per year after 2010. The current toll structure on the turnpike, which took effect on January 4, 2009, is based on weight, not the number of axles on commercial vehicles. Heavy trucks (class 7) currently pay tolls of almost 41 cents per mile, class 6 trucks pay 28.5 cents per mile, and class 5 trucks pay about 22.5 cents per mile on the turnpike (Pennsylvania Turnpike Commission 5).

A toll of 31 cents per mile (which is close to the average of turnpike tolls for trucks in classes 5, 6, and 7) would increase the non-labor variable costs of operating a truck by just under fifty percent

relative to its current level (American Transportation Research Institute)<sup>1</sup>. The projected toll per mile in Pennsylvania is much higher than on the Ohio Turnpike, where proposed tolls that will take effect in the fourth quarter of 2009 are just under 17 cents per mile for five axle trucks paying cash (Ohio Turnpike Commission 12)<sup>2</sup>. If tolls on Interstate 80 match current tolls on the Pennsylvania Turnpike, heavy trucks (62-80,000 lbs) would pay more than double the rate for comparably sized trucks in Ohio and higher than the rates charged by Illinois, Indiana, New York, or New Jersey on their major toll highways<sup>3</sup>. Figure 1 shows how of tolls in on the Pennsylvania Turnpike compare with tolls in each of the above states.

## **ECONOMIC MODEL OF THE IMPACT OF TOLLS**

Some proponents of toll on 80 publicly assert that it is a user fee to pay for the costs of maintaining the highway. It is better understood as a tax or tariff, since much of the revenue will be used for purposes other than maintaining and improving Interstate 80 and since vehicles that use Interstate 80 already pay for using it via fuel taxes and other taxes. Owners or operators of commercial vehicles in Pennsylvania pay taxes on fuel plus a registration fee of more than \$1600, a highway use tax of over \$550 per vehicle, a 12 percent excise tax on the purchase of a truck, and several other taxes and fees (Kahle). State diesel fuel taxes in Pennsylvania, at 38.1 cents per gallon, are the highest in the nation. Trucks that travel I-80 pay more than \$90 million dollars and cars pay more than \$40 million dollars each year in state and federal taxes and user fees for the miles they travel on I-80<sup>4</sup>. By

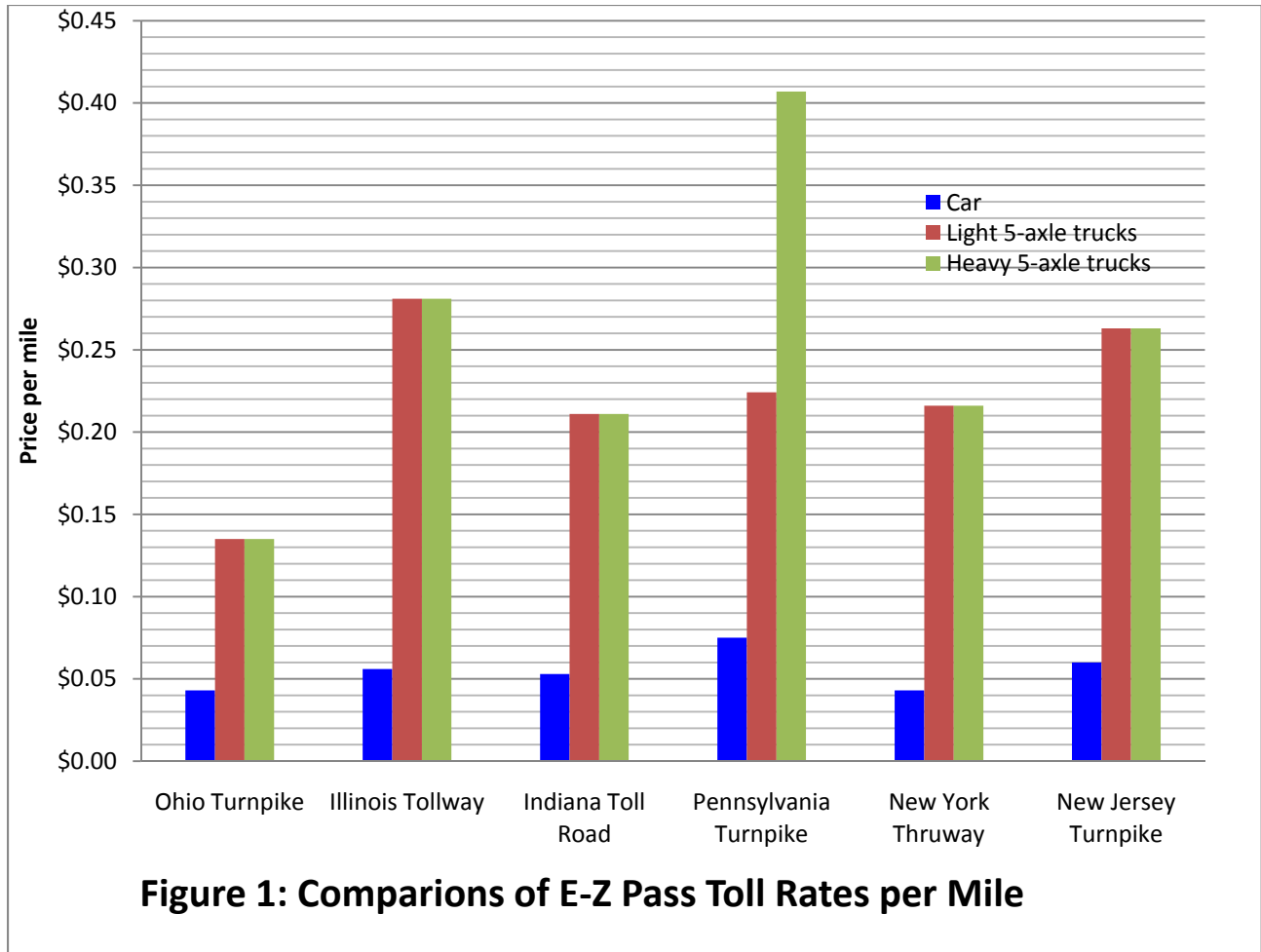
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<sup>1</sup> This calculation uses The American Transportation Research Institute (ATRI) estimates, except that the state tax rate for diesel fuel is used and fuel and oil costs are assumed to be 42 cents a mile rather than the 63.4 cents per mile calculated by ATRI for 2008, when fuel was more expensive than it is in 2009.

<sup>2</sup> The Ohio Turnpike plans to offer a discount for E-Z pass users. The projected toll rate for five-axle trucks with E-Z pass is 13.3 cents per mile.

<sup>3</sup> Data on tolls comes from the websites of each state's toll highways- [www.ohioturnpike.org](http://www.ohioturnpike.org), [www.getipass.com](http://www.getipass.com), [www.getizoom.com](http://www.getizoom.com), [www.paturnpike.com](http://www.paturnpike.com), [www.nysthruway.gov](http://www.nysthruway.gov), [www.state.nj.us/turnpike](http://www.state.nj.us/turnpike). Rates for Illinois and New Jersey are those that apply during peak hours.

<sup>4</sup> This assumes an average tax per mile of 0.0796 for trucks and 0.0198 for cars. The costs per mile for trucks include the federal highway use tax, taxes paid to the state of Pennsylvania under the International Fuel Tax Agreement, taxes paid to the state under the International Registration Plan, and taxes paid to the state Public



comparison, when the PTC applied for tolling authority, PennDOT's annual spending to operate and maintain I-80 averaged \$80 million per year (Pennsylvania Turnpike Commission 6)

Proponents of tolling Interstate 80 point out that that vehicles from other states would pay most of the tolls on 80; therefore, tolls would act like an import tariff. Besides raising revenue for the government, basic economics demonstrates that a tariff reduces the price received by producers who sell goods that of each good in response to the higher price caused by the tariff. In response to the lower

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Utility Commission. It assumes average gas mileage of a little less than 9 miles per gallon for all trucks. For cars, it includes the cost of federal and state gasoline taxes and assumes an average gas mileage of 25 miles per gallon. Total costs are calculated by multiplying the cost per mile for trucks by the estimated annual vehicle miles for trucks and the cost per mile for cars by the estimated annual miles driven by cars on I-80 in 2006. The estimated share of vehicle miles driven by trucks was 34.8 percent based on PennDOT average daily traffic data for 28 sections of I-80 for 2006 (Pennsylvania Department of Transportation, "Mileage and Travel, Selected Routes").

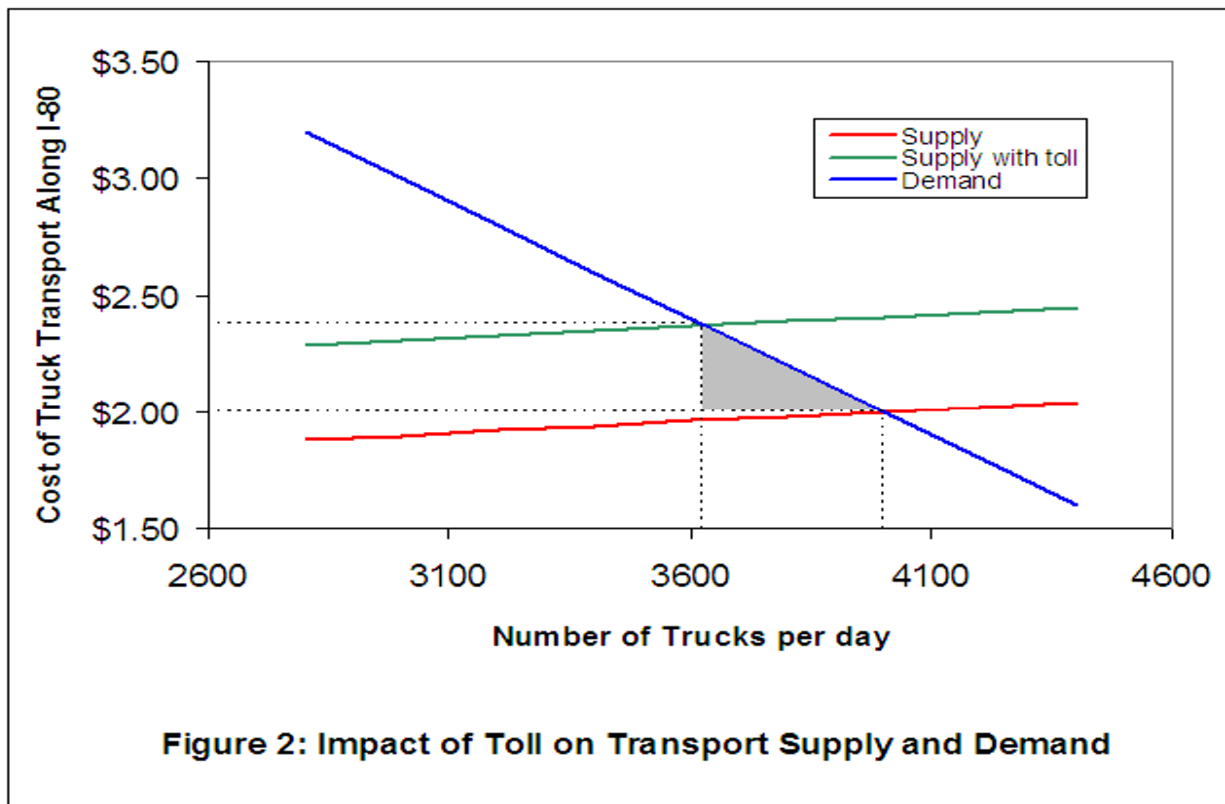
price received are subject to the tariff and raises the price for consumers of those goods<sup>5</sup>. Consumers will consume less net of the tariff, producers (in this case shippers) will lower the amount they supply. All of the revenue earned by the government comes from consumers and producers. The tariff, however, results in an additional loss to producers and an additional loss to consumers. Consumers lose the net benefits from the goods they do not buy and producers lose the net revenue from the goods they do not sell because of the additional cost resulting from tolls. Thus, the loss to producers and consumers from tolls exceeds the revenue gained by the government. Economists call this the deadweight loss.

This deadweight loss can be calculated using a simple model of the market for transportation along 80. Suppose we assume that without tolls shippers will pay two dollars per mile to ship a truckload of goods along I-80. Imposing tolls of 41 cents per mile will raise the cost of shipping goods, resulting in fewer goods being shipped along I-80. Because truckers will be competing with each other for less business, they will raise shipping charges by less than the cost of toll. To avoid the higher costs of shipping along 80, some truckers will travel along alternate routes. The cost of shipping goods along the alternate routes will be greater than the cost of shipping along 80 without tolls. For goods that continue to be shipped along 80 in spite of tolls, the loss to shippers, consumers, and truckers will equal the toll revenue earned. Shipping goods along alternate routes, however, will involve a loss to truckers, shippers and consumers. This loss will equal the additional costs of shipping goods along alternate routes. Firms and consumers will also experience losses from those goods that will no longer be shipped due to the higher transport costs. The Turnpike Commission will earn no additional toll revenue to offset the extra cost of shipping goods on alternate routes not subject to toll or to offset the loss from goods no longer shipped.

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<sup>5</sup> Any principles of economics textbook will demonstrate that a tariff has the effects described in this report. For a more detailed discussion of the topic, see Krugman and Obstfeld (182-192).

Figure 2 shows the impact of tolls on transport costs and on the number of trucks that use 80. Numbers on the graph, though not far from some observed values, are not based on actual data. The shaded triangle is the deadweight cost associated with tolls. The total cost of tolls equals the number of trucks per day that continue to use I-80 times the average mileage traveled times the toll rate per mile



plus the deadweight cost. The graph assumes just over 3600 trucks per day use 80 if the toll rate is 41 cents per mile. The deadweight loss is due to the approximately 400 trucks that no longer use 80 and either use an alternate route not subject to toll or no longer pick up and deliver the goods they would have shipped if there were no toll.

Some trucks that take alternate routes to avoid tolls will be diverted locally around toll stations but will still travel part of the way along 80. Others will take an entirely different route, such as the Pennsylvania Turnpike, instead of I-80. Local diversion and long distance diversion to routes other than

the PA Turnpike could equal between five and ten percent of vehicle miles traveled on 80<sup>6</sup>. If the additional cost of shipping on alternate routes averages half the cost of tolls, then in addition to the \$292-\$310 million that truckers will pay in tolls, shippers, consumers, and truckers combined will suffer deadweight losses of between \$8 and \$15 million per year<sup>7</sup>.

## **TOLLING IMPACTS ON PENNSYLVANIA FIRMS AND HOUSEHOLDS**

Tolls apply to goods shipped along 80 from firms in Pennsylvania and thus will lower the prices received by those firms. The many manufacturing firms in the region will ship fewer goods along 80 and receive less, net of tolls, for each unit they ship. Toll, like tariffs, lower prices more for firms that have fewer alternative places where they can ship their products without being subject to tolls. This is likely to be the case with firms along 80 in Pennsylvania, especially in the counties that are far from alternative Interstate highways.

Tolls raise prices more for consumers and businesses that have fewer low cost alternative sources of supply, which is more likely to be the case if they are located in counties close to Interstate 80. In other parts of Pennsylvania, the fastest alternative east-west highway is the turnpike, which has tolls as high as those proposed on I-80. To avoid paying tolls, trucks traveling to Southeast and South Central Pennsylvania currently rely on 80 combined with 322 to ship goods from the Midwest. With tolls on 80, they, too, may pay more for goods they receive and receive less for goods they ship to the Midwest, whether they continue to rely on 80 or switch to the turnpike.

The lower price that businesses shipping along I-80 receive net of tolls would in turn affect the number of workers they hire and the wages they pay. Companies that sell fewer products at a lower

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<sup>6</sup> PennDOT in its 2005 study of the feasibility of tolls on 80 estimated that diversion rates could be as high as 14 percent. Although some of the traffic diverted from 80 will likely take the turnpike, half or more will likely use another route that is not subject to tolls.

<sup>7</sup> These estimates were calculated using data on average daily truck miles traveled on Interstate 80 in 2006 and assuming that between ten percent and fifteen percent of truck vehicle miles would be diverted to alternate routes. Toll will increase transport costs by about 20 percent for class 7 trucks. A reasonable estimate for the price elasticity of freight transportation is -0.8, which implies that truck traffic will fall by 16 percent. (Litman 55) It may fall by less than this, since some trucks are smaller than class 7 and pay lower tolls.



price would demand fewer workers. Workers competing with each other for fewer jobs may accept lower wages, unless unions or minimum wage laws prevent wages from falling. If they cannot reduce wages, firms will instead reduce the number of workers employed or their hours worked. Some firms may choose to shut down entirely if the price they receive net of tolls is not enough to cover their costs.

Besides firms that ship goods along Interstate 80 and consumers of products shipped along Interstate 80, tolls will also harm firms that purchase inputs shipped along 80. Toll will hurt firms in a number of different industries. Businesses that have chosen to locate in the area because of access to Interstate 80 will be among those hurt the most by tolls.

### **INDUSTRIES LIKELY TO BE AFFECTED BY TOLLS**

A number of businesses, whose presence depends on proximity to the Interstate, have grown up along 80. These include firms that produce manufactured homes, wood product manufacturers, manufacturers of transportation equipment, gas stations and truck stops, trucking companies, and warehouses. The presence of an Interstate highway that provides easy access from the Midwest to New York and other northeastern cities has motivated firms to locate along 80 and in some cases to expand their presence. One example of this is Appalachian Wood Products, a firm that moved to Clearfield in 1987 because of the region's abundant hardwood forests combined with its proximity to Interstate 80 (S. Patz and Associates). Firms in other industries, such as mining, agriculture, and tourism and firms manufacturing primary metals, fabricated metals, electrical equipment, machinery, and furniture also have an important presence along Interstate 80. In 2006, each of these industries employed more than one thousand workers in the counties adjacent to Interstate 80 (US Census Bureau).

Agriculture is also a major employer in the counties along Interstate 80. The number of farms ranges from 349 in Monroe County to 1,211 in Lycoming County (USDA National Agricultural Statistics Service). Most farmers in the region are part-time, but average net income per farm is more than

\$20,000 in Clinton and Northumberland Counties and more than \$49,000 in Union County<sup>8</sup>. Farming is especially important in Centre, Clinton, Union, Mercer, Lycoming, Columbia, and Northumberland Counties, with the total value of agricultural products sold exceeding \$40 million in each of these counties. Dairy products are the largest source of farm income in most counties, with the exception of Union and Northumberland counties where poultry and egg production is the most important income source. Farmers depend on Interstate 80 to transport their products to processors and for important farm inputs, such as fertilizer and feed.

The impact of tolls on dairy farmers will depend on where their farms are located. Assuming a cost of transporting milk of \$1 per hundredweight, tolls will result in a cost increase of almost ten percent for farms that ship their milk at least 60 miles along 80 to get to the processing plant<sup>9</sup>. This assumes that milk tanker trucks will charge a hauling cost that includes the round trip cost of tolls. Toll on 80 would have the biggest impact on farmers in Clarion, Clearfield, and Jefferson counties, which are a considerable distance from the nearest milk processing plant. Figure 3 shows the approximate percentage increase in milk transport cost by county<sup>10</sup>.

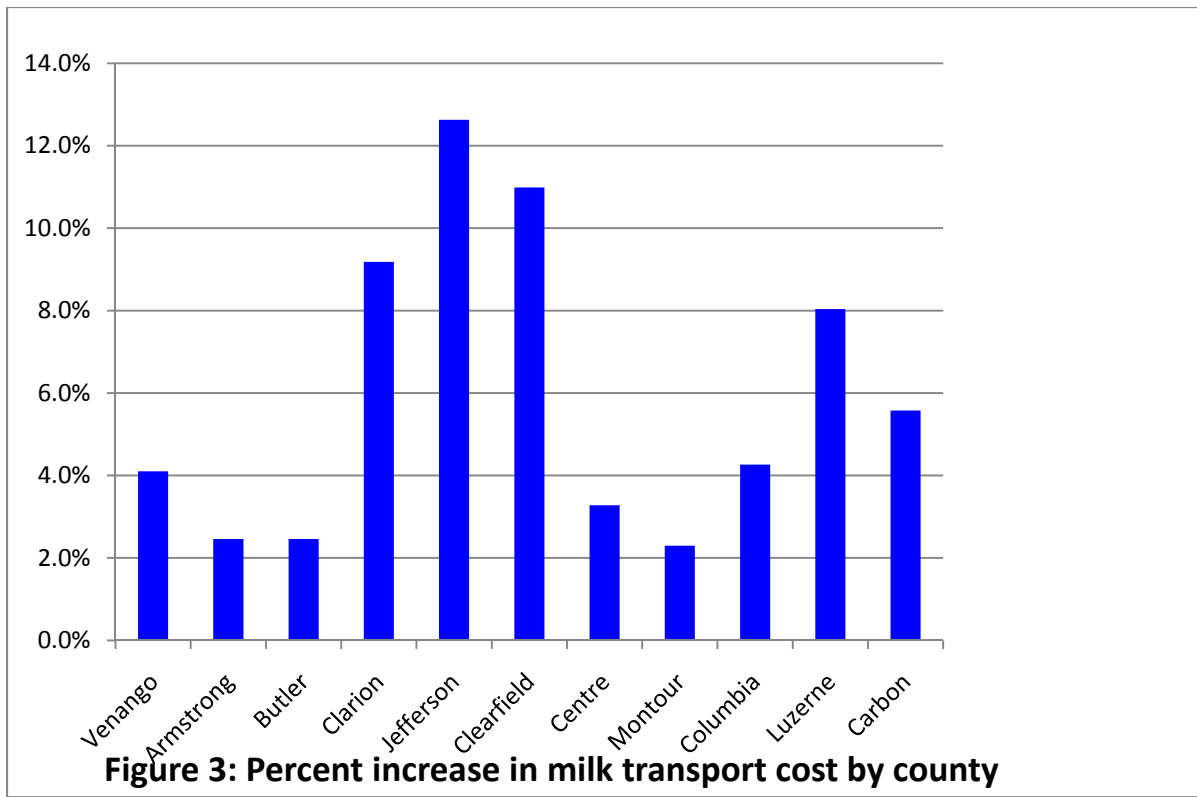
Another industry that tolls on 80 will hurt is the tourism industry. Thousands of jobs in the I-80 corridor depend on tourist spending. Many tourists from major urban areas rely on Interstate 80 to reach destinations in the central part of the state and in Northern tier counties. Tourism is important in several counties in west central and central Pennsylvania, such as Cameron and Forest counties, which have tourism sectors that are a larger share of total spending than most other counties in the state (Global Insight 44). The counties with the largest share of total tourism spending in central Pennsylvania

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<sup>8</sup> Net farm income is the earnings of the farm family from operating the farm after subtracting out expenses. It includes labor income of the family members who reside on the farm.

<sup>9</sup> Data on the cost of transporting milk was provided by Earl Fink of the Pennsylvania Association of Milk Dealers. He estimated costs of between 75 cents and one dollar per hundredweight. My calculations used a cost of one dollar per hundredweight as the cost without tolls.

<sup>10</sup> Calculations assume that milk is transported along 80 from an exit near the middle of the county to the nearest processing plant. Processing plants are in Sharpsville near the Ohio line, in Williamsport, in Sunbury, and in New Jersey.



are Centre, Lycoming, and Clearfield Counties. Tourism related employment in the region ranges from 168 in sparsely populated Forest County to over 5000 in Centre County (Global Insight 68, 70). Tourism-related employment includes jobs providing transportation and fuel, food and beverages, lodging, shopping, and entertainment services to travelers who “made an overnight trip or traveled in excess of 50 miles for a day-trip” (Global Insight 1).

The Great Outdoors Region, consisting of Cameron, Clarion, Clearfield, Elk, Forest, and Jefferson counties, is a popular destination for tourists from eastern Ohio and the Pittsburgh area. A growing number of tourists come to this area from Ontario to play golf (Morris). According to the Pennsylvania Department of Travel and Tourism (66), the Great Outdoors Region hosted 1.1 million person trips, the average visit lasted three days, and the average travel party spent \$464 per trip in 2003. If visitors to the region travel an average of forty miles each way on I-80, tolls would raise the cost of an average round

trip visit by \$6<sup>11</sup>. Although this seems like a relatively small cost increase, it will likely affect the travel plans or spending decisions of tourists on a limited budget. The number of visits to the region would decrease and many travelers who continue to visit the region would likely spend less on other goods and services in the area to offset the money they would be spending on tolls. Using the above figures along with the conservative assumption that demand for tourism related goods and services is relatively inelastic, the estimated reduction in tourism spending in the six county region would be almost \$1.4 million dollars per year<sup>12</sup>.

Another group of firms that may experience impacts from tolls is retailers, such as grocery stores, which sell products that are shipped along Interstate 80. These retailers will likely pass the higher costs on to consumers, thereby raising the cost of living in the region. Dennis Curtin, a Spokesman for Weis Markets, with 126 stores located in Pennsylvania and 57 stores supplied directly by Interstate 80, estimates that tolls would cost the company more than one million dollars per year. The company would most likely pass most of the additional one million dollars along to Pennsylvania families as higher food costs (Keister).

## **TOLLS A HEAVY BURDEN ON PENNSYLVANIANS**

Some of largest impacts of tolls on Interstate 80 would be on firms in manufacturing, trucking, and wholesale distribution. Most of the manufacturing firms in the Interstate 80 corridor sell their products in regional or national markets. In a recent survey of manufacturing firms in Mercer County, only one out of seven reported that it sold more than 20 percent of its output in the counties located near Interstate 80, while six of seven reported shipping most of their output out of state. This means a

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<sup>11</sup> Although the distance from the Ohio border to the center of the region is about 80 miles, calculations assume visitors travel an average of forty miles each way on I-80. While many visitors are from Ohio, some are from the Pittsburgh area, Ontario, and other parts of western and central Pennsylvania and travel shorter distances on 80.

<sup>12</sup> Calculations assume an elasticity of demand of -0.5. One study of the elasticity of demand for visits to national parks in Costa Rica found demand elasticities ranging from -0.96 to -2.87 (Chase, Lee and Schultz). If the above calculations used an elasticity of demand of -1 instead of -0.5, the predicted reduction in tourism spending would be \$2.8 million per year in the six-county region.

large part of their output must be transported a considerable distance, part of which is along Interstate 80.

An example of a firm that will bear a high cost from tolls is a Clinton County manufacturer of sanitary paper that employs approximately 1400. A representative of this firm estimated that tolls would raise its shipping costs by close to 2 million dollars per year (Flanagan). Proximity to 80 enables this firm to ship a variety of paper products at low cost to major population centers where there are numerous competitors. Low labor costs and other local advantages have resulted in at least one other firm in this industry recently building a factory in central Pennsylvania.

Transportation equipment manufacturers, many of whom produce equipment used by trucks, such as truck trailers, may also be highly vulnerable if they depend on truckers who use Interstate 80 to buy their products. Besides reducing demand for their products, tolls may cause a considerable increase in the cost of purchased inputs for firms in this and other industries. One small Mercer county supplier of fiberglass truck hoods expects the cost of transporting inputs and supplies to rise by between four and five thousand dollars per month if tolls are implemented on 80.

Firms in industries with a long history in this area, such as primary and fabricated metal manufacturing, prospered long before the government built Interstate 80, relying on rail transportation. Today, those firms rely more heavily on trucks to transport their inputs and finished products. A substantial percentage of employment in primary metal manufacturing is in firms located near the Ohio state line and close to Interstate 79 (US Bureau of Labor Statistics). To the extent that these firms ship their products or receive inputs from the east coast, tolls on 80 would have a significant impact on them. Many of these firms face stiff competition from overseas. For example, the steel pipe and tubing industry has had a difficult time due to competition from Chinese manufacturers.

An example of a firm in this industry that tolls will negatively affect is located in Mercer County and ships fifteen thousand tons per month east on Interstate 80, most of it to New Jersey and beyond.

Tolls would increase the cost of shipping this product by more than \$900,000 per year. Shipping cost could increase by more than this, if as reported by a representative of the firm, the firm must pay for the trucks returning empty (Weisberg). This firm faces global competition and so may bear a large percentage of the cost increase rather than passing it on to consumers. This firm would not switch to shipping by rail because rail service is not easily accessible to most of its customers. Rail is not a viable alternative because of the cost and risk of product damage from shipping part way by rail and transferring the load to a truck.

Many small businesses will also experience increases in costs. A company supplying building materials that ships products from western Pennsylvania to Bristol, which is near Philadelphia, is one example. The owner estimates that his freight costs to ship products across the state would rise by about 25 percent if truckers raise his rates by the full cost of tolls, increasing his total costs by about \$13,000 per year, which is a substantial burden for a small businessperson (Penn-Northwest Development Corporation). Although he may be able to pass some of these higher costs onto his customers, if some of his competitors in the Philadelphia area get their supplies via a route other than Interstate 80, raising his prices may significantly hurt his sales.

Besides trucking companies and the firms described above, other firms that report expected transportation cost increases of over \$100,000 per year due to tolls include a wholesale distribution center, modular home manufacturers, a chemical manufacturer, a tour bus company, an auto auction company and a wholesale garden supplier. The estimated increase in toll costs of the auto auction company is more than 6 percent of its annual payroll. While some of these costs will likely be borne by the consumers of the firm's products, it constitutes an important additional tax for each firm.

## **Estimating the Impact of Tolls on Quantity Sold and Price- example from the Home Manufacturing**

### **Industry**

More important than the total costs of tolling is how much it is likely to lower sales and the price received for products shipped along 80 compared to what sales and price would be without tolls. Two industries where tolls would cause a large percentage reduction in price and quantity sold are the manufactured housing industry and the prefabricated wood building industry.

The home manufacturing industry is much more heavily concentrated in some counties along Interstate 80 in Pennsylvania than elsewhere in the United States, as measured by its location quotient (Economic Modeling Specialists, Inc.). Before the recent recession, the manufactured housing industry employed more than one thousand workers and the prefabricated wood building industry employed several thousand workers along the I-80 corridor (US Census Bureau). Calculating the expected impact of tolls on the manufactured home industry reveals the order of magnitude of likely negative effects of tolls on similar industries that ship large bulky products or products with low value per unit of weight.

Firms in this industry ship modular housing units as oversized loads. They either ship their own products, or rely on other firms in the industry to provide trucking services. Home manufacturers in this region ship between 50 and 95 percent of their units along 80. Modular home producers located in Pennsylvania ship approximately forty percent of the homes they produce to other states ("I-80 Toll Road Proposal Expected to Hurt Modular Housing Industry"). Most shipments require a truck and two cars to accompany the truck. Because home manufacturers use special trucks to transport these units, the trucks must make a round trip for each unit shipped, paying tolls each way.

Most tractors and trailers used to ship manufactured and modular housing units have between seven and eleven axles and are rated for loads of 65,000 to 80,000 pounds (Weaver). Based on the proposed toll schedule discussed by Wilbur Smith Associates in their study for the Turnpike Commission, the most common sized vehicle, a tractor and trailer that together have 8 axles would pay a toll of

almost 56 cents per mile<sup>13</sup>. Add in the cost of the two cars required to accompany each oversized load and toll will increase the total one way cost of shipping a unit by almost 72 cents per mile.

The impact of tolls on price, output and employment for an industry, such as manufactured housing, depends on the share that tolls are of the market value of the product and on how much of the increase in cost the producer will pass along to consumers, which in turn depends on the responsiveness of demand to price. Calculations assume that firms have market power and set a price that will maximize profits. The results below are for a house with a current market value of \$72,000 that consists of four units, each shipped a total of 250 miles with 100 miles being on Interstate 80.<sup>14</sup>

Table 1 shows the range of estimated impacts of tolls. It compares results for the case where the truck itself (assumed to include eight axles with the attached trailer) must pay a toll of 56 cents per mile and the case where the truck must pay the rate of \$3.03 per mile that oversized vehicles must

**Table 1. Estimated Impact of Tolls on the Modular Housing Industry.**

<b>Toll for oversized vehicles</b>	<b>Assumed responsiveness of sales and production to price</b>	<b>Percent decrease in price received net of transport cost</b>	<b>Percent decrease in quantity sold</b>
\$0.56/mile	Both highly responsive	0.65 percent	1 percent
\$0.56/mile	Both moderately responsive	0.6 percent	0.6 percent
\$0.56/ mile	Sales highly responsive & production unresponsive	0.8 percent	0.5 percent
\$0.56/mile	Sales unresponsive & production highly responsive	0.45 percent	0.4 percent
\$3.03/mile	Both highly responsive	1.7 percent	2.6 percent
\$3.03/mile	Sales highly responsive & production unresponsive	2.1 percent	1.25 percent
\$3.03/mile	Both moderately responsive	1.6 percent	1.6 percent
\$3.03/mile	Sales unresponsive & production highly responsive	1.2 percent	1.1 percent

See appendix for explanation of details and assumptions.

<sup>13</sup> The 2009 cost for an oversized vehicle, which is considered class 9, to use the Pennsylvania Turnpike is \$3.03 per mile (Pennsylvania Turnpike Commission). It is not clear whether oversized vehicles will be required to pay as much as they currently pay on the turnpike, but without assurances to the contrary, this is a distinct possibility.

<sup>14</sup> Producers ship each unit separately using a tractor and carrier (Rice). The market value of each modular housing unit is between \$12,000 and \$30,000 (Weaver) According to a survey sponsored by the US Dept. of Housing and Urban Development, the average sales price for a multi-section manufactured home was \$74,100 (US Dept of Commerce, Bureau of the Census). Part of this sales price includes the cost of assembling the home on the site.



currently pay on the turnpike. Depending on how high the toll is and the responsiveness of sales and production to the higher cost, the estimated decrease in quantity sold could be between 0.4 and 2.6 percent and the expected decline in the price received by producers could be between 0.45 and 2.1 percent. Changes in quantity sold are likely to lead to a corresponding reduction in employment in the industry.

Competition from firms in New York State and along Interstate 81 in Pennsylvania limits the ability of firms in this industry to raise prices in response to tolls. Unless they pass along the full cost of tolls to their customers, higher transportation costs mean that firms effectively receive a lower price at the factory gate for each housing unit shipped. The lower demand for the units will in turn reduce the demand for labor. In small towns and rural areas where workers have fewer options than in metropolitan areas, reduced demand by an important local industry could lead to lower wages. Most of the reduction in demand will likely be borne by the owners of the firm as a lower rate of return on equity. The long-term effect of lower returns on equity is to discourage future investment and possibly motivate firms to relocate.

### **Impact of Tolls on Firms in Other Industries**

The impact of tolls on sales and price for firms in other industries depends on the share of transportation cost in total costs. The higher the share of transportation cost, and the more responsive sales is to price, the bigger the likely reduction in the demand for labor and thus on employment and wages. One firm along 80 with transportation costs that are a very high share of total costs is in the wholesale garden supply business. A representative of this firm estimated that transportation cost accounts for 35 percent of the cost of topsoil that it ships to retailers (Kasmoch). Assuming the firm ships each bag an average of 78 miles on 80, tolls of almost 41 cents per mile would raise the average

cost of a bag of topsoil by 3.2 percent<sup>15</sup>. This compares with a 2 percent increase in the cost of modular housing in the high toll scenario shown in table 1. Thus, the impact of tolls on this wholesale garden supply firm should be more than fifty percent larger than the predicted impact of tolls of \$3.03 per mile on modular housing manufacturers.

Very few firms incur transportation costs greater than ten percent of the value of their products and most spend much less than ten percent of the final goods price on transportation (Wilson). Thus for firms in most other industries, the impact of tolls would likely be smaller than for the manufactured housing industry.

In other industries, just as with the manufactured housing industry, most of the cost of toll is likely to be borne by the supplier rather than the consumer of the product. Most firms that ship along I-80 face competition from firms in other states and thus have limited ability to raise their prices to offset the impact of tolls without experiencing significant declines in sales.

### **Impact on Trucking Industry**

Of the different types of businesses, truckers, especially independent truckers, are among those on which tolls are likely to have a large impact. Truckers who transport products long distances in Pennsylvania have limited ability to raise the rates they charge because of competition from other truckers shipping similar products on alternate routes and from products shipped by rail. While some truckers can escape tolls by using alternate routes, competition from them will make it more difficult for truckers who continue to ship products along Interstate 80.

According to the Census Bureau, as of 2006, there were more than 7500 people employed in long distance freight trucking in the counties adjacent to Interstate 80. This overstates the number of trucking businesses that depend on 80 in Pennsylvania, since four of the five counties with the largest number of workers employed in trucking are those adjacent to another Interstate highway or located

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<sup>15</sup> Each truck carries one thousand 40-pound bags of topsoil, which sell for a wholesale price of about one dollar each.

near the border with Ohio or New Jersey. A more conservative estimate is that there are between four and five thousand people in the counties close to 80 employed in long distance trucking who haul products substantial distances along 80 in Pennsylvania. About nine percent of all those employed in truck transportation in the state are independent truckers (US Bureau of Labor Statistics).

If the government implements tolls, truckers themselves may experience substantial declines in their incomes. Consider the example of an independent trucker who travels 250 miles on Interstate 80 five days a week for 46 weeks per year. With reasonable assumptions, annual income could fall by between \$435 and \$1910 per year for a class seven truck (table 2). In the scenarios listed in the table, the trucker bears between 3 and 14 percent of the cost of tolls and passes the rest along to the producers and consumers of the products he ships. The size of the decrease in income depends on the level of toll, which varies with the weight of the truck, and on how much of the toll cost the truck driver can pass on to the shipper and final consumer.

**Table 2. Impact of 41 cents per mile toll on annual income for a truck owner-operator**

Avg. Daily Distance on 80	150 miles	250 miles
<b>Case 1- Transportation Share of Value Added = 5 percent</b>		
Very responsive demand & unresponsive supply <sup>16</sup>	-\$593	-\$990
Demand & supply both moderately responsive	-\$435	-\$739
Very responsive demand & mod. responsive supply	-\$1013	-\$1704
<b>Case 2- Transportation Share of Value Added = 10 percent</b>		
Very responsive demand & unresponsive supply	-\$1130	-\$1879
Mod. responsive demand & unresponsive supply	-\$851	-\$1417
Very responsive demand & mod. responsive supply	-\$1910	-\$3173

The impact of tolls on truckers depends on their ability to pass costs on to final consumers or to shippers. If final product demand is responsive to price, but supply of the product and supply of transport services are not very responsive to price, the product price will not rise by much, the producer

<sup>16</sup> Calculations use estimated marginal costs and average wages for truckers that are from a study by the American Transportation Research Institute. The first and third rows for each case assume the elasticity of supply of trucking services is 0.5 and the elasticity of demand for the good being shipped is -4. The top row assumes the elasticity of supply of the good being shipped is 0.5, while the second and third rows assume an elasticity of goods supply of one. The moderately elastic row assumes elasticity of supply of trucking services of one and elasticity of goods demand of minus two.

of the product will bear most of the increase in transport cost and the firm transporting the product will not lose much. Truckers can pass a large share of cost increases to producers if product supply is relatively unresponsive to price or pass a large share to final consumers if sales are unresponsive to price. The smaller the share that transportation costs are of total costs the easier it is for truckers to pass the cost of tolls along to producers and consumers of the product. If both product supply and demand are very responsive to price and supply of trucking services is relatively unresponsive, then truckers will bear a larger share of the toll costs.

One of the arguments in favor of tolls on Interstate 80 is that most of the trucks that use 80 are from out of state and are passing through Pennsylvania to deliver their products to another state. Although the percentage of trucks is large that ship products from out of state to another state and pass through Pennsylvania, some of the trucks that do this are from trucking companies located in the state of Pennsylvania. For example, First Americus Enterprises of Luthersburg, in Clearfield county, has a fleet of 36 trucks, most of which travel the 310 miles across 80 in Pennsylvania, delivering products from west of the Ohio state line to locations in the northeast (“Toll may put area trucking firms out of business”). Continuing to use 80 could involve an even higher cost for this Pennsylvania business and its employees than those calculated in the hypothetical example above. It is likely that this firm would move to a location where its trucks could more easily reach alternative highways such as Interstate 86 that are not subject to toll, reducing job opportunities for truck drivers who want to remain in Clearfield County.

### **Impact of Tolls on Warehouses**

One sector that may be especially susceptible to higher tolls is the warehouse sector, which is important in Clearfield County. As of 2007, the firms in the warehouse business employed over 1000 Clearfield County workers (Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis, “Clearfield County Profile”). Clearfield County has the highest concentration of workers in the warehouse industry relative to population of any county. This is the result of

substantial growth during the last decade (Marr, Drzyzga, and Pomeroy). One of the largest warehouses in the state is the Wal-Mart distribution center in Clearfield County. John Lynch, vice president for federation relations for the American Trucking Association, said that tolling I-80 would increase transportation costs by \$7.2 million per year for this distribution center (Grata). While such an increase may be tiny in comparison to Wal-Mart's annual revenue, its relentless efforts to keep costs down could result in closing this distribution center and moving to a location along an Interstate highway not subject to tolls, such as 81.

If Wal-Mart were to close its warehouse in Clearfield County, the municipality would lose \$52 per employee in occupation privilege taxes. The Wal-Mart distribution center employs about one thousand workers, so the total loss in revenue from the occupation privilege tax paid by former Wal-Mart workers would be \$52,000 per year. This loss in revenue would necessitate an increase in other taxes or a cut in services. Some of those laid off from Wal-Mart would find other jobs in the area, offsetting part of the loss in revenue from occupation privilege taxes, but local governments would also lose local income tax revenue from the workers who do not find other jobs immediately. Thus, the total loss to local governments and school districts would likely be much greater than the lost revenue from the occupation privilege tax alone.

The likely impact of tolling I-80 on warehouses can be estimated in a similar manner to its impact on trucking. If low cost storage locations near other highways are close to markets now served by warehouses on 80, tolls could result in a large decline in the quantity of warehouse services demanded and a reduction in the price charged for warehouse storage. Warehouse and storage costs amount to between 2 and 5 percent of the cost of goods (Frazelle 3). If warehouse costs are 5 percent and transportation costs are 10 percent of total product value, warehouses could reduce the price they charge for storage by as much as 2.5 percent in response to tolls, which may discourage continued

investment in warehouses along Interstate 80<sup>17</sup>. Warehouses near 80 already face competition from the numerous warehouses located near Interstate 81, which will not be subject to tolls and is close to major urban areas (Marr, Drzyzga, and Pomeroy).

In such a highly competitive industry, even a relatively small cost increase resulting from tolls may be enough to cause firms to move their warehouses and distribution centers to a different location. Other firms that may have considered building warehouses near 80 may build elsewhere because of tolls. Target recently began construction of a warehouse in Union County that would employ up to 800 workers, but halted construction in October of 2008 because of the state of the economy (“New Years Wishes”). An upturn in the economy could persuade them to resume construction, but the renewed possibility that the state will succeed in imposing tolls on I-80 is another reason for them not to.

#### **Effect of Toll on Gas Stations and Truck Stops**

Tolls may have an even bigger effect on firms that service trucks and automobiles that travel along Interstate 80. In response to tolls, some vehicles would take alternative routes instead of 80 and others would take fewer trips. A reduction in traffic would result in a reduction in revenue to truck stops and other firms that rely primarily on customers who travel on Interstate 80. If much of the traffic diverted is vehicles traveling short distances, which are less likely to patronize businesses near 80, the reduction in revenue may be smaller than the reduction in traffic. Most of the trucks on 80, however, are traveling long distances. While long distance truckers may be less inclined to incur the time cost of diverting around individual toll stations, many of them may switch to the turnpike, US 422 and 22, or Interstate 86 through southern New York, in response to tolls on 80. Wilbur Smith Associates (6) estimated that in response to tolls, at 2010 traffic levels, 1700 commercial vehicles per day would be

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<sup>17</sup> The 2.5 percent figure assumes the supply of products to warehouses and the demand for products from warehouses are both very responsive to price (elasticities of 4 and -4 respectively), while the quantity of warehouse space along 80 is relatively unresponsive to price. This could be the case if firms could switch to alternative warehouses for little additional cost. If product supply and demand were somewhat less responsive to price or transport was a smaller share of output, the reduction in price the firm could charge for storage might be closer to 1 to 1.5 percent

diverted from 80 to an alternate route. Although the average number of miles these vehicles would be diverted is likely considerably less than the entire length of Interstate 80, they could account for close to ten percent of the commercial vehicle miles traveled on 80. If an average of ten percent of commercial vehicle miles that would have been on 80 are on a different highway because of tolls, truck stops and other firms that service primarily commercial vehicles that travel along 80 can expect a comparable sized reduction in their revenues. The many restaurants and gas stations located close to exits will also experience a decline in revenues, depending on what percentage of their current clientele is from the Interstate.

### **Costs to Commuters**

In addition to costs to businesses, tolling Interstate 80 would result in a higher cost to commuters. In the largely rural counties along 80, many skilled workers commute substantial distances to work in their fields of specialization. For example, in response to a survey, the director of government relations for Sharon Regional Health Systems reported that almost 200 of that firm's employees commute along Interstate 80.

A study of the costs to out-commuters from seven central Pennsylvania counties found total costs of tolls for commuters to be between \$693,000 and \$4.2 million per year depending on what percentage of commuters use Interstate 80 (Central Pennsylvania Workforce Development Corporation). This study assumed that all cars would pay tolls proportional to the mileage traveled on 80. The total cost to commuters from all counties along Interstate 80 is likely two to three times as large as the total costs for central Pennsylvania. For commuters from the seven counties in the study, the estimated average cost of tolls ranged from \$195 per year for Union county commuters to \$821 per year for commuters from Lycoming County.

The total cost may be smaller because part of the Turnpike's Commission's proposal included exempting cars that use E-Z Pass from tolls if they pass through no more than one tolling station. Since

the proposal also included locating toll collection points about every thirty miles along the highway and not at exits, most commuters would be exempt from tolls. Those who pass two toll collection points, however, would pay \$2.70 per day in tolls or \$1,296 per year based on 240 days of work per year.

It is uncertain whether the above provisions, designed to exempt motorists who travel short distances on 80 from tolls, will remain part of the tolling plan if the Turnpike Commission revises it so that it has a good chance of being approved by the Department of Transportation. According to an unpublished memorandum written by the Federal Highway Administration's chief counsel Marcus J. Lemon, one problem with the original proposal was that it was "probably unconstitutional" because it would discriminate against out-of-state drivers ("Problems for Penn Pike in getting Feds OK to toll I-80 in legal counsel Memo"). Thus to meet the requirements of the Federal Highway Administration, the state may have to revise its proposal to include tolls at each exit point or eliminate the exemption for cars that only pass one tolling station.

## **DIFFERENCES IN THE IMPACT OF TOLLS BY COUNTY AND REGION**

Tolls will have a very different impact on some counties than others, depending upon the mix of businesses and industries located in each county and the location of the county. Tolls would likely have the largest impact on counties close to Interstate 80 in central and west central Pennsylvania. Residents and businesses in these counties do not have access to alternative Interstate highways as do residents in the eastern third of the state or in counties close to the Ohio border.

Counties along the western edge of the state may still bear a large cost of tolls because Interstate 80 provides such good access to population centers in eastern Pennsylvania, New Jersey and the New York City metropolitan area. They include several small metropolitan areas and have important connections to the Pittsburgh and Youngstown areas. These counties contain a high concentration of firms in the iron and steel industry, metal, and machinery manufacturing.



Wood and paper products manufacturers are important industries in the heavily wooded counties in the central and west central parts of the state. Wood furniture production is a related industry, which though it is small along the I-80 corridor, could potentially expand (“Cluster Analysis-SDF Region” 27). As noted above, access to Interstate 80 is an important reason why firms in these industries have located in this area.

Coal mining and oil and gas extraction, though important in counties all along 80, are most important in Clearfield, Jefferson, Armstrong, and Butler counties. These industries have a long history in the region (Pennsylvania Department of Labor & Industry). Industries with backward and forward linkages to coal, oil and gas production and distribution are also important, such as mining machinery manufacturing, mining equipment wholesalers and pipeline transportation. These industries rely on trucks using Interstate 80 for transportation of inputs (Coon). Although railroads transport much of the coal mined in the region, at least one railroad company recognizes that it could benefit from developing an inter-modal operation involving the transfer of coal from trains to trucks in order to ship to more destinations (S. Patz and Associates 51).

There are numerous primary and fabricated metals manufacturers in the Interstate 80 corridor. Industries in this group have high location quotients, which imply that they export most of their products to other regions, in many cases shipping them along 80 (“Cluster Analysis- SDF Region” 29). Primary metal manufacturers are heavily concentrated in western Pennsylvania, although some are also located near the eastern edge of the state and in Lycoming County in the center. Most of the counties along 80 contain some primary metals producers, and all contain some fabricated metals producers (US Census Bureau). Fabricated metal production is particularly concentrated in Elk and Jefferson counties in the western part of the state. In 2006, firms classified as fabricated metal producers employed more than 23,000 workers in the counties along Interstate 80.

Centre County is different from other counties along I-80 because of the impact of Penn State University. A larger percentage of the population works for the state government, in professional and technical services, and in company and enterprise management, and a smaller percentage is employed in manufacturing (Pennsylvania Department of Labor and Industry, Center for Workforce Information and Analysis, "Centre County Profile"). This difference in the economic structure, along with the fact that Interstate 99 and US 322 pass through the county and provide a safe and convenient transportation route to Pittsburgh, South Central Pennsylvania, and the Philadelphia area, suggests that tolls on 80 will have a smaller impact on Centre County than on other central Pennsylvania Counties close to 80.

Firms in the eastern part of the state are more densely populated but have some of the same industries as firms further west. Textile and textile product manufacturing is important in Columbia, Luzerne, and Northumberland counties. Tolls on Interstate 80 may not hurt these firms as much because each county is close to Interstate 81. For firms in these counties shipping their products or receiving inputs from the Northeast or Midwest, however, Interstate 80 is a vital link.

## **SECONDARY IMPACTS**

In addition to the direct effects of toll on income and employment of workers in the affected industries, firms in Pennsylvania that sell purchased inputs to the affected firms and firms that sell products to the employees of the affected firms will experience indirect impacts. The indirect impacts will vary by industry. For the manufactured home industry, one estimate is that every 100 jobs in manufactured home production in Clarion county is associated with 20 additional jobs in supplying industries and 26 additional jobs in businesses that sell goods and services to people who work in home manufacturing and supplying industries (Penn State's Workforce Education & Development Initiative). Thus every ten jobs lost in manufactured home production could result in almost five additional jobs lost in other businesses within the county.

Multiplier effects vary by the size of the region considered, with multipliers being larger the larger the region accounted for in the analysis. Thus, for example, the home manufacturing industry has a larger impact on the entire I-80 region than it does in Clarion County alone. A study of the powdered metal manufacturing industry estimated that every 100 jobs in powdered metal manufacturing are associated with 168 jobs throughout the six-county region in North Central Pennsylvania where that industry is concentrated (Baker and Passmore 23). The multiplier effect on rural Pennsylvania of one dollar of additional wages and proprietor income earned by the warehouse sector is a total of \$2.12 of additional earnings statewide (Marr, Drzyzga and Pomeroy 13). If earnings are roughly proportional to jobs, then each additional job in the warehouse sector is associated with a total of just over two additional jobs in rural areas<sup>18</sup>.

Multiplier effects should be interpreted with caution, given the imprecision of the estimates. Although counties near I-80 are largely rural, they constitute less than half of all rural counties in the state. The multiplier estimates above imply that compared to the number of jobs lost directly in response to tolls, the total job losses in the region affected by tolls could be 1.5 times as great or more.

## **TOTAL IMPACT ON BUSINESSES AND THEIR EMPLOYEES**

As of 2006, there were more than 100,000 workers employed in manufacturing in the counties close to Interstate 80<sup>19</sup>. In addition there were almost 30,000 workers employed in transportation and warehousing, almost 25,000 employed in wholesale trade, and about 4800 employed in mining (Pennsylvania Dept. of Labor & Industry). The typical worker in each of these industries earns a high enough wage to support a family. Toll will not have as big of an effect on workers employed in the above industries in counties close to Interstates 79 or 81, which are some of the more heavily populated

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<sup>18</sup> Statewide employment multipliers are actually slightly larger than earnings multipliers, so that this assumption may underestimate the impact of warehousing job losses on total employment in rural areas (Marr, Drzyzga and Pomeroy 14)

<sup>19</sup> The counties include all of the counties traversed by Interstate 80 plus Lawrence, Armstrong, Cameron, Elk, Forest, and Lycoming counties, each of which is close to 80 and likely dependent on it for eastbound or westbound commercial shipments or both.

in the region. A conservative estimate is that at least 75,000 workers in Pennsylvania, many of whom are the primary breadwinners for their families, work for an employer that depends on 80 for shipping its inputs, outputs, or both. If the state succeeded in getting tolls on 80 approved, these firms would experience higher costs of shipping products or of purchasing inputs. Many of them would reduce employment and some would likely reduce wages. Profits would fall and some firms might even shut down if they could not pass enough of the costs to consumers, workers, or suppliers.

In addition to firms in the above industries, thousands of people who work in firms involved in retail trade may experience major impacts from tolls on 80. In some cases, such as truck stops and restaurants close to the highway, employment could fall by ten percent or more if long distance diversion is as large as Wilbur Smith Associates (6) says it could be.

## **IMPACT ON WEALTH AND INVESTMENT**

Since so much of what is produced by firms in the I-80 corridor is sold to consumers outside the region, consumers can more easily avoid the cost of tolls by buying from different suppliers, while firms located along 80, with fewer alternatives, are likely to bear most of the cost of tolls. Workers can switch jobs or move to a different location rather than accept lower wages, but firms that own a plant near 80 cannot move as easily. Thus, tolls will result in lower product prices and lower rates of return on equity for firms located near 80.

Even a small difference in rates of return could make a big difference for a firm considering whether to invest in a new plant or expand an existing plant. Several firms have mentioned that the possibility of tolls being implemented on Interstate 80 may have affected their plans to invest and expand operations. In response to the survey of firms in Mercer County, a representative of one firm reported that expectation of tolls on I-80 kept his firm from investing \$120 thousand and creating five new jobs. A representative of another firm stated that his company has been contemplating

constructing a \$1.5 million distribution center where I-80 and 79 come together but is now hesitant to do so because of possible tolls on 80.

Few firms will move to a different location in response to lower earnings caused by tolls on I-80. Instead, firms and households will lose wealth as the demand for land and buildings accessible to 80 declines. Although some firms without much invested in fixed plant and equipment might be able to move their assets to another location to maintain an acceptable rate of profits, most firms would likely experience a decline in the market value of their immobile assets, such as land and buildings, that reflects the lower expected earnings resulting from tolls. With fewer firms willing to invest in new plants or expand existing plants in areas near I-80, asset prices will fall until expected annual earnings as a percent of equity will equal what that firm could earn elsewhere.

Medium sized businesses, like those in the areas along I-80 have historically earned returns on equity averaging about 25 to 30 percent (Internal Revenue Service)<sup>20</sup>. Using average historical returns as an upper bound for the required rate of return for investment of firms located along 80, each dollar of reduction in the value of sales due to tolls would result in a decline in wealth to business owners, farmers, and residents in the counties along I-80 of between \$3.33 (1/.3) and \$4 (1/.25).

Consider the likely impact on a fabricated metal manufacturing firm in Mercer County that would incur toll costs of \$915,000 per year. Based on a 2006 average rate of return on equity for S-corporations in this industry of 29%, and assuming that the shipper bears 65 percent of the cost of tolls, the expected reduction in the value of this firm's equity would be approximately \$2,150,000 (Internal Revenue Service 246)<sup>21</sup>. This is one of the larger firms in Mercer County, but tolls may have a comparable or greater impact on other large firms along I-80.

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<sup>20</sup> Average returns on equity for S Corporations in 2006, calculated from IRS data, were about 30 percent for all industries and about 26 percent for manufacturing. Average returns in 2005 were almost 32 percent for all industries and 25 percent for manufacturing.

<sup>21</sup> Calculations assume that the firm itself bears the entire loss from the lower price received net of tolls. Some of this loss may be borne by input suppliers and labor to the extent that input suppliers and workers lack alternatives

Not only will toll cause a capital loss for existing firms, but it will also result in losses on money invested preparing sites for future economic development. In partnership with private firms, federal, state, and local economic development agencies have invested millions of dollars to develop industrial parks and other sites in the counties along Interstate 80. For example, private firms and governments have invested a total of \$166.3 million since 1998 to make 1019 acres available for development in Mercer County (Roknick 14). The investments have included providing roads and access to sewer, water, natural gas, and electricity on undeveloped sites, demolition of some existing buildings, and environmental remediation. Of the money invested in Mercer County sites, \$34 million dollars came from government and non-profit organizations, with \$28 million from the state of Pennsylvania. Although investment in industrial parks and other sites has not been as great in most of the other counties along 80 as in Mercer County, federal, state, and local governments have invested millions to prepare sites for economic development in each county. Table 3 shows state and total public investment by county for some of the counties along 80.

Many of the sites chosen for economic development were outside of urban areas, but close to exits on 80. Examples of sites chosen because of their convenient access to 80 include Trinity Point in Clarion County, Clearfield Fireman's Park, Woodland Industrial Park, Lamar Township Business Park in Clinton County, the DuBois-Jefferson County Airport, Barkeyville Industrial Park in Venango County, and a 218-acre site near exit 15 that Mercer County acquired in December of 2007. With the exception of those properties acquired recently, the various private and public agencies invested in these properties before anyone had any reason to expect that the state would seek to impose tolls on 80<sup>22</sup>. Tolls on 80 will reduce the willingness of firms to move to these various sites as well as lowering the amount they

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that pay as well as they could have earned supplying this firm in the absence of tolls. Any loss to workers and local input suppliers can be attributed to their location close to Interstate 80 and thus should ultimately be reflected in lower property values. Thus, the total loss in wealth resulting from tolls may be shared by the firm's owners, input suppliers, and workers.

<sup>22</sup> Although the state considered tolling 80 before the legislature passed Act 44, PennDOT had concluded in a study released in February 2005 that tolling 80 should not be pursued (DiStefano).

would be willing to pay for land and buildings. Both public and private investors are likely to experience capital losses on their investment as a result.

**Table 3: Investments in Economic Development Sites in Selected Counties along I-80 (thousands of dollars))**

County	Sources of Funds					
	Federal	State	Local	Total Government	Non profit	Total public & semi-public
Clarion	\$2,370	\$5,584	\$75	\$8,030	*	\$8,030
Jefferson	*	*	*	\$29,400	\$300	\$29,700
Northumberland	\$1,428	\$3,326	*	\$4,754	*	\$4,754
Mercer	*	\$28,000	*	\$28,000	*	\$34,000
Centre	\$4,310	\$4,578	*	\$8,888	\$277	\$9,165
Clinton	\$1,250	\$2,169	*	\$3,419	*	\$3,419
Union	\$1,755	\$1,022	*	\$2,777	\$400	\$3,177
Columbia	\$3,256	\$2,957	\$514	\$6,727	\$13	\$6,740

\*- Amount unknown

Sources: Clarion County Development Corporation; Penn-Northwest Development Corporation; Craig Coon, Director of Community and Economic Development, Jefferson County; SEDA-Council of Governments, Berwick Industrial Development Association.

Toll will not render those sites worthless, but may change the way they are developed. The possibility of tolls has prompted Clarion County to consider marketing its Trinity Point site as an office park instead of an industrial park, since manufacturers are more dependent on truck transportation and thus will lose more from tolls. If fewer manufacturing firms are attracted to the area because of tolls, this will adversely affect the many local workers who lack a college education.

### **COSTS OF TOLLS TO CONSUMERS IN THE REST OF THE STATE**

Not only will tolls hurt businesses and households that live in the Interstate 80 corridor, but they will also cause an increase in costs for consumers who live in other parts of the state, including the Philadelphia and Pittsburgh metropolitan areas. Approximately four hundred trucks per day travel along I-80 to deliver goods and services from western Pennsylvania and the Midwest to the Philadelphia

Metropolitan area.<sup>23</sup> Trucks from the Midwest likely travel at least half way across the state on Interstate 80 and then use either US 322 or the northeast extension of the turnpike to ship their loads to the Philadelphia area. Approximately eighty trucks per day travel across 80 to deliver goods to the Pittsburgh area from eastern New York, northern New Jersey, and New England. With tolls on 80, most of these trucks would probably come from I-81 and then use 80 and I-99 or I-79 to travel to Pittsburgh. With tolls, some might take the turnpike instead of 80, but the increase in cost compared to traveling on 80 with no tolls would be about the same. The estimated cost of tolls on 80 is about \$8.4 million dollars per year for goods shipped to the Philadelphia area and about \$2.1 million dollars per year for goods shipped to Pittsburgh. Retailers will pass part of the cost of the tolls on to consumers in the form of higher prices of these products.

Interstate 80 is also important for shipping goods to smaller metropolitan areas such as Erie, Harrisburg, Altoona, Lancaster, and Allentown. In addition to the higher costs to consumers, many producers in these other parts of the state ship goods along 80 and will likely receive less for their products if the state implements tolls.

## **INDIRECT EFFECTS OF TOLLS**

### **Impact of Plant Closings and Reduced Property Values on Government Revenue and Expenditures**

Besides higher costs or lower revenues for firms and their employees, by reducing employment and income, tolls on 80 could have an indirect impact on state and local budgets through its effect on tax revenue and unemployment compensation. The biggest impact will occur if a firm in a county near Interstate 80 shuts down operations because of the cost of tolls. A Sealy spokesman blamed the closing of the company's mattress factory, employing more than 100 workers and located along Interstate 80 in

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<sup>23</sup> Estimates used data on tons shipped to Philadelphia from Michigan, Minnesota, Wisconsin, the northern parts of Illinois, Indiana, and Ohio, and the remainder of Pennsylvania. See appendix for additional details. Calculations assume that each truck carries 20 tons and pays the class 7 toll rate. Calculations do not include shipments from Iowa and westward, but assume that those shipments travel along Interstate 70 and the Turnpike instead of 80 in Pennsylvania (Bureau of Transportation Statistics (USDOT) and U.S. Census Bureau) .



Clarion county, partly on the anticipated cost of tolls along I-80 (“Sealy closing Strattanville plant”). In its official statement, the company attributed the closing to current economic conditions and a decrease in manufacturing requirements (Sealy Corporation). Although not the primary reason, the possibility of tolls on 80 may have played a role in the company’s decision of which factory to close because of reduced manufacturing requirements,

When a plant closes, the local government, school district, and state government will lose earned income tax revenue. In some cases, the county, municipality, and school district will lose property tax revenue from the plant that closed. In addition, the state will lose revenue from corporate income taxes, the capital stock and franchise tax and sales and use taxes paid on purchases by the firm. The biggest cost of a plant closing is likely to be the unemployment compensation paid out.

Consider the impact on government budgets of a plant employing 250 workers. If the plant has a fair market value of \$3 million, an assessment ratio of 53% and a combined property tax rate of 12.482 mills, then the plant would pay just under \$200,000 in real property taxes. With a school district tax of 8.55 mills, the school district would receive more than \$147,000 of annual property tax revenue from the plant<sup>24</sup>. If the plant were to close down, the municipalities and the school districts in which they reside would lose personal income tax revenue. If workers earn an average of \$36,000 per year and take an average of 13 weeks to find other jobs at the same average wage as the jobs they lose, the school district(s) would lose a combined total of \$11,250 of revenue from personal income taxes. Municipal governments would lose this same amount.

The cost to the state government from the closing of a plant employing 250 workers would be much larger than the cost to local governments. Assuming 13 weeks of unemployment, the state would lose about \$69 thousand in state income tax and pay out a total of over \$1 million in unemployment compensation. To make up for this extra cost, unemployment tax rates would need to increase on

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<sup>24</sup> The property tax rates used in this example are actual rates for the borough of DuBois and the DuBois Area School District in Clearfield County in 2005.

workers throughout the state. In addition, the state would no longer receive corporate net income tax or capital stock and franchise tax revenue from the firm. They also would not receive sales and use tax revenue from products purchased by the firm. Using a hypothetical example of a firm with just under \$1.5 million in income apportioned to its Pennsylvania operations, if the plant shut down, the state would lose a total of approximately \$150,000 in revenue from the corporate net income tax and other taxes paid by firms. Thus, if a plant that employs 250 workers were to close down in response to tolls on Interstate 80, it could cost the state government and taxpayers around \$1.4 million dollars in the first year.

It is not possible to predict with any degree of accuracy how many firms might close down in response to tolls on I-80 or how many workers might lose their jobs. By far the largest long run effect of tolling, however, is likely to be a reduction in property values for areas close to I-80.

Basic economics teaches that property values and thus property tax revenue will decline in counties near Interstate 80, unless counties and school districts raise tax rates by an offsetting amount. The size of the decline in property values should reflect the lower expected earnings of firms and workers in counties along Interstate 80 combined with the higher cost of living to commuters and others who travel along it regularly. If we make the conservative assumption that one third of vehicle miles on 80 are from trucks shipping products to or from firms in Pennsylvania, transportation costs for these firms will increase by approximately \$100 million per year<sup>25</sup>. Assuming that truckers will pass along 40 percent of this \$100 million to out-of state shippers or to out-of-state consumers leaves a total cost to state residents of \$60 million per year resulting from tolls on trucks. Add to this the cost to in-state automobile drivers, estimated to be about \$55 million per year, assuming forty percent of car tolls on 80

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<sup>25</sup> Using PennDOT data on average daily vehicles miles, along with various assumptions about diversion, we estimated that annual toll revenue would be approximately \$440 million with about \$300 million from trucks and \$140 million from cars. See appendix table A-1 for the estimates and assumptions used in calculating each one.

will be from in-state drivers, and the total annual cost to PA residents of tolls will be approximately \$115 million per year.

As noted above, businesses will locate in Pennsylvania only if they can earn as much on their Pennsylvania assets as they could earn elsewhere. If the required rate of return on equity is 25 percent, then \$60 million in extra costs to businesses from tolls will reduce the value of assets in Pennsylvania by  $60\text{million}/0.25 = \$240\text{ million}$ <sup>26</sup>.

Besides the reduction in the value of business assets, tolls will reduce the value of residential property in areas accessible to I-80. The willingness of anyone to live in Pennsylvania depends on the cost of living. A higher cost of living lowers the present value of the benefits of living in Pennsylvania. Assuming a mortgage interest rate of 6 percent per year, the \$54.6 million cost of toll to automobile drivers who use I-80 will result in a decline in property values of  $54.6/.06 = \$910\text{ million}$ <sup>27</sup>. Thus, tolls on I-80 will likely result in a loss of wealth to residents and businesses that depend on it of greater than one billion dollars<sup>28</sup>. The resulting loss in property tax revenue will equal the property tax rate times \$1.15 billion. If the average tax rate was 7.5 mills and the common level ratio was 27%, the school districts along I-80 will lose about \$23 million in revenue<sup>29</sup>.

### **Impact on Highway Safety**

Truckers would impose substantial costs on other drivers and on local communities if some of them switched to secondary roads that parallel 80. Besides additional noise and pollution for nearby

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<sup>26</sup> The high estimate for the required rate of return on business equity reflects the greater leverage of small business firms as well as the fact that some of recorded business profits may actually be wages of the proprietor of the business. A lower rate of return, which may be more realistic, would increase the size of the loss in asset values resulting from tolls.

<sup>27</sup> The interest rate for 30-year mortgages averaged about 6 percent from 2004 to 2008 and has averaged a little more than 5 percent in 2009 (Board of Governors of the Federal Reserve System)

<sup>28</sup> Some of the cost of tolls on business firms will actually be borne by workers who live in the area, and some of the cost of tolls to commuters may be borne by the firms that employ those workers in the form of higher wages. Thus both business asset and residential property values will decline as a result of tolls on commercial vehicles and automobiles, though not necessarily in the proportions described above.

<sup>29</sup> The tax rate is from Columbia County, which has property taxes that are neither the highest nor the lowest for counties near 80 (Pennsylvania Governor's Center for Local Government Services). The rate applied to the market value of property is the rate in mills multiplied by the common level ratio (State Tax Equalization Board).

residents and increased wear and tear on the pavement, alternate routes would be more dangerous to drive on if more trucks used them in order to avoid tolls. The injury rate is more than three times as high and the fatality rate is almost three times as high on roads that are not Interstate highways as on Interstate highways in Pennsylvania (Pennsylvania Department of Transportation 16). Thus, if cars and trucks use alternative routes instead of 80, injuries and fatalities will likely increase. Calculations using accident rate data for state highways in comparison to Interstate highways and Wilbur Smith and Associates' estimates of diversion suggest that tolls on 80 could cause an increase of between 2 and 4 deaths and between 100 and 200 injuries per year<sup>30</sup>. Besides local diversion around toll plazas, these calculations assume that between one fourth and half of traffic that is diverted a long distance will use US 422 and 22 and Interstate 99 instead of Interstate 80. The calculations assume that this diversion involves traveling about 170 miles on these alternate routes instead of Interstate 80. This likely understates the increase in fatalities and injuries because it does not account for a likely increase in accident rates due to heavier traffic on alternative routes that were not designed for long distance trucks.

The problem of traffic diversion causing an increase in fatalities was a major reason why the Ohio Turnpike Commission (OTC) lowered tolls for trucks in 2005. Secondary roads that parallel the Ohio Turnpike had experienced substantial increases in truck traffic when the OTC raised tolls in the 1990s. One estimate is that when the OTC lowered tolls for commercial vehicles, the number of trucks on secondary roads paralleling the turnpike fell by 23 percent while the number of accidents fell by 25 percent (Joyce).

The above accident rate calculations assume that about fourteen percent of truck vehicle miles that would have traveled on Interstate 80 will use alternate routes. The reduction in truck traffic on 80

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<sup>30</sup> Calculations used crash statistics provided by PennDOT for the five-year period beginning January 1, 2004 and ending December 31, 2008. Some calculations used general crash statistics from the 2007 Pennsylvania Crash Facts and Statistics Book (Pennsylvania Department of Transportation 16). A PennDOT representative provided crash statistics for US 422 and 22.

due to tolls may be larger than fourteen percent as evidenced by the impact of reduced commercial vehicle tolls on the Ohio Turnpike. Between 2004 and 2005, when commercial vehicle tolls fell by an average of 2 cents per mile (18 percent) on the Ohio Turnpike, truck traffic rose by 15.5 percent, with bigger increases for heavier trucks (Ohio Turnpike Commission, *Comprehensive*)<sup>31</sup>. This evidence, combined with elasticity data from other studies implies that diversion from Interstate 80 in Pennsylvania resulting from tolls increasing from zero to almost 41 cents per mile could be twenty percent or more (Litman 55)

## **OTHER ISSUES**

### **Income and Employment in Counties Adjacent to Interstate 80**

If, as proposed, PennDOT uses toll revenues from Interstate 80 to fund highway maintenance and transit system operating costs in other parts of the state, some of those areas may experience economic benefits as a result, benefits paid for partly by businesses and workers along the Interstate 80 corridor. The parts of the state most likely to receive more benefits than they pay in costs associated with tolls for using 80 are the most prosperous parts of the state with the highest incomes and lowest unemployment. All of the counties along Interstate 80 have per capita incomes below the state average and considerably below those for the Philadelphia and Pittsburgh metro areas (US Dept. of Commerce, Bureau of Economic Analysis - 2006). The per capita income in most of these counties is eighty percent or less of the state average. Per capita income is more than eighteen percent above the state average in Allegheny County (the Pittsburgh area) and almost 22 percent above the state average in the Philadelphia metro area. All but three of the counties along Interstate 80 (Butler, Centre, and

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<sup>31</sup> Other factors such as the large rise in diesel fuel prices that occurred in 2004 and 2005 may have contributed to more trucks choosing the Ohio Turnpike over alternate routes. With higher fuel prices, the fuel savings from being able to maintain steady speeds on the smooth surface of the turnpike may offset the cost of tolls.

Montour) had average unemployment rates that exceeded the state five-year average for the years 2003 to 2007 (US Bureau of Labor Statistics).

The presence of Interstate 80 resulted in many high value-added jobs in manufacturing and distribution being located in the region. Implementation of tolls on 80 will eliminate a competitive advantage of counties near 80 as compared to counties near the turnpike, which offsets the disadvantage resulting from the I-80 corridor being further from major urban centers. Although entrepreneurs will still find ways to create jobs in the counties adjacent to 80, they might not pay as well due to less competition for labor caused by the higher cost of transporting goods from the area and of transporting inputs and supplies to the area. In addition, many workers might choose to move to another state or another part of Pennsylvania where better paying jobs are available, adding to the decline of the working population and tax base in the mostly rural counties near I-80.

### **What about Offsetting Benefits?**

Supporters of tolls would argue that the benefits from greater spending on construction and maintenance of 80 and other roads and highways would offset the costs of tolls. The choice, however, need not be between using revenue from I-80 tolls to fund highway and bridge maintenance and improvements and not providing sufficient funding for those purposes. There are alternative ways to fund road and bridge maintenance, such as an increase in fuel taxes. A ten cent per gallon increase in fuel taxes would raise about 600 million dollars per year, which is more than revenue projected from tolls on I-80 even under an optimistic scenario. Compared to tolls of 40.7 cents per mile, this would raise transportation costs by less

than 1.5 cents per mile for a class 7 truck if it gets seven miles per gallon of fuel. It would only increase cost by half a cent per mile for an average car.

Instead of concentrating the costs on one region of the state and discouraging drivers from using the safest and fastest route to their destinations, an increase in fuel taxes would have a minimal effect on any industry or region of the state. This would be better than incurring the additional costs of creating the infrastructure for tolls plus the debt service from continuing to borrow money for several years before the state receives any revenue from tolls on I-80.

### **Financing Costs and their impact on future tolls**

Debt and debt service costs are a major problem associated with proceeding with plans to toll 80. As discussed below, the Pennsylvania Turnpike Commission (PTC) was already planning to incur billions of dollars of additional debt as part of its plan to implement tolls on 80. Because of the Federal Highway Administration's recent denial of the state's request to impose tolls, the actual date when tolls could begin to be collected, if a revised application is submitted and approved, will likely be several years later than originally anticipated. This could add additional debt that taxpayers and motorists who use Interstate 80 and the turnpike will be responsible to pay.

Beginning in fiscal 2008, the Turnpike Commission issued bonds to pay for its obligations under Act 44. Between 2008 and 2012, the PTC expects to borrow between \$540 and \$750 million per year (Pennsylvania Turnpike Commission appx. H). The Turnpike Commission intends to use this debt to pay most of its required annual payments to PennDOT, which began at \$750 million in fiscal 2008 and rise to \$900 million by fiscal 2010<sup>32</sup>. The state intended to use this money to fund "grants to mass transit agencies and various road, highway, bridge, and capital projects of PennDOT" (Pennsylvania Turnpike

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<sup>32</sup> Since the Turnpike Commission will not be converting 80 to a toll road in 2010 as originally planned, the required annual payment under Act 44 will be reduced to \$450 million per year after that (Pennsylvania Turnpike Commission 62). The Commission has the option of extending the conversion date past 2010 and thus continuing to pay \$900 million per year, which they might do if they decide to resubmit their application to the FHWA.

Commission, Comprehensive Annual Report 30). These payment obligations to PennDOT are subordinate, meaning the PTC is to pay them from money remaining after paying operating costs and capital costs for the turnpike and Interstate 80. Part of the agreement, however, requires that the Turnpike Commission adjust tolls so they will generate revenues sufficient to cover the amounts owed to PennDOT (Pennsylvania Turnpike Commission, Comprehensive Annual Report 62). This open-ended commitment could result in the commission raising tolls much higher than proposed in Act 44 in order to cover the costs of the required lease payments. If traffic projections turn out to be overly optimistic, as they often are for toll roads, making the lease payments and servicing the debt accumulated in the years before they begin collecting tolls may require higher tolls than currently proposed.

Besides the level of tolls required to meet obligations, the amount of debt the Turnpike commission plans to incur could be a major long-term burden for Pennsylvania taxpayers and motorists. In its initial proposal prior to the passage of Act 44, the PTC indicated plans to borrow a total of about \$14 billion to use for capital expenditures and payments to PennDOT (Commonwealth Foundation). The proposal included plans to pay off all of this debt over a forty- year period using toll revenue from the turnpike and I-80. In 2008, the PTC revised its plans, proposing to borrow almost \$44 billion total. Based on a range of projected debt service costs, and the revenue anticipated from tolls, the Commonwealth Foundation estimated that when the 50-year lease agreement to toll I-80 expires, the Turnpike commission will have unpaid debt of between \$38 and \$73 billion.

## **CONCLUSIONS**

Although the cost to individual firms of I-80 tolls may not seem large, when combined together over all of the counties affected, the total costs are substantial. While it is not clear how many plants would shut down due to the impact of tolls on Interstate 80, one or more employers that are just barely surviving could find it unprofitable to continue to operate if there were tolls on Interstate 80. The result would be that between a few hundred and a few thousand workers could lose their jobs. Because of



tolls, existing firms will be less likely to expand their operations and new firms less likely to invest in the area, so that hundreds of other well-paying jobs may not be created in the area. In an economy where competition (even without the impact of higher transportation costs) results in some existing firms failing every year, less new investment in the area means that the total number of high paying jobs is likely to decline in a part of the state that is already well below average in income and employment.

## **SOURCES CITED**

- American Transportation Research Institute. *An Analysis of the Operational Costs of Trucking*. Atlanta: American Transportation Research Institute, 2008. Web. 15 May 2009.
- Baker, Rose M. and David L. Passmore. *Global Competitiveness of Powdered Metallurgy Part Manufacturing in North Central Pennsylvania*. University Park, July 2009.
- Board of Governors of the Federal Reserve System. "30-Year Conventional Mortgage Rate." *St. Louis Federal Reserve Bank*. 2009. Web. 22 July 2009.
- Bureau of Transportation Statistics (USDOT) and U.S. Census Bureau. *2002 Commodity Flow Survey*. December 2004. Web. 15 June 2009.
- Central Pennsylvania Workforce Development Corporation. "Interstate 80 Project: Cost to Commuters." 2008. Web. 6 January, 2009.
- Chase, Lisa, David Lee, William Schultz, Deborah Anderson. "Ecotourism Demand and Differential Pricing of National Park Access in Costa Rica." *Land Economics* 74.4 (1998): 466-482. Web. 7 July 2009.
- Commonwealth Foundation. "Turnpike Commission Triples Act 44 Debt from \$14 Billion to \$44 Billion." 2 September 2008. *Commonwealth Foundation for Public Policy Alternatives*. Web. 10 July 2009
- Coon, Craig. *Jefferson County Economic Development Corporation* Telephone interview. 16 June 2009.
- DiStefano, Tom. "2005 PennDOT Study Advised Against Tolling I-80." *The Clarion News* 6 September 2007.
- Economic Modeling Specialists, Inc. *Industry Report for Clarion County for NAICS 321991 and 321992*. Industry Report. University Park, PA: Pennsylvania State University, 2008.
- Fink, Earl, "Cost of Transporting Milk." Message to the author. 18 June 2009.
- Flanagan, Mike. "Clinton County Manufacturers that rely on I-80". Message to the author. 20 February 2009.

- Frazelle, Edward. *World-class warehousing and material handling*. New York: McGraw-Hill, 2002.
- Global Insight. *The Economic Impact of Travel & Tourism in Pennsylvania*. Harrisburg: Pennsylvania Tourism Office. Dept. of Community and Economic Development, 2007. Web. 2 July 2009.
- Grata, Joe. "Trucking groups back higher fuel tax over turnpike lease, I-80 tolls." 12 August 2008. *Pittsburgh Post-Gazette*. Web. 28 May 2009
- "I-80 Toll Road Proposal Expected to Hurt Modular Housing Industry." *PR News Now*. 2007. Web. 24 December 2008 <[www.prenews.com/TextNews/171387.html](http://www.prenews.com/TextNews/171387.html)>.
- Internal Revenue Service, Statistics of Income Division. *Fall SOI Bulletin*, July 2008. Web. 1 July 2009.
- Joyce, James P. "Alternatives to Funding Transportation In Pennsylvania." Lecture given in Clarion, 5 December 2008.
- Kahle, Pat. Text of speech against Tolling I-80. 19 June 2009.
- Kasmoch, Dave. Telephone Interview. 14 July 2009.
- Keister, Amanda. "A toll on business...Companies say I-80 plan to cost them millions." *Daily Item* 17 November 2007. Web. 10 June 2009.
- Krugman, Paul and Obstfeld, Maurice. *International Economics: Theory and Policy*. Boston: Addison-Wesley, 2009. Print.
- Litman, Todd. "Transportation Elasticities: How Prices and Other Factors Affect Travel Behavior." 19 July 2009. *Victoria Transport Policy Institute*. Web. 23 July 2009.
- Marr, Paul, Scott Drzyzga and George Pomeroy. *Economic and Transportation Impact of Warehousing on Rural Pennsylvania*. Harrisburg: The Center for Rural Pennsylvania, 2008. Web. 28 March 2009.
- Morris, Dave. "Tourism in the Pennsylvania Wilds Region." Message to the author. 18 June 2009.
- "New Years Wishes." *The Daily Item* 1 January 2009. Web. 19 June 2009.
- Ohio Turnpike Commission. *Comprehensive Annual Financial Report*. Berea, Ohio: Ohio Turnpike Commission, 2007.
- . "Ohio Turnpike Mileage Table and Schedule of Tolls for Non E-Z Pass Class 1-7." 2007. Web. 3 June 2009
- . *Report and Recommendation of New Toll Rate Schedules*. White Paper. Berea: Ohio Turnpike Commission, November 2008. Web. 3 June 2009.
- Penn State's Workforce Education & Development Initiative. "Role of Home Manufacturing in the Economy of Clarion County". Economic and Workforce Brief. University Park, PA: Pennsylvania State University, 2008.

- Penn-Northwest Development Corporation. "I-80 Questionnaire Responses." Mercer County: Penn-Northwest Corporation, 2007.
- Pennsylvania Department of Labor & Industry. "2007 Per Capita Income by County". *Center for Workforce Information and Analysis* Web. June 2009
- . "County Profiles." *Center for Workforce Information and Analysis*. January 2009. Web. 4 June 2009
- . "Employment and Unemployment." *Center for Workforce Information and Analysis*. 2007. Web. 3 June 2009.
- Pennsylvania Department of Transportation. "2007 Pennsylvania Crash Facts and Statistics." 2009. PennDOT, Bureau of Highway Safety and Traffic Engineering. Web. 9 June 2009 >
- . *I-80 Tolling Study*. Harrisburg: PennDOT, February 2005.
- Pennsylvania Department of Travel and Tourism. "Great Outdoors Region Travel Overview, Overnight Leisure Travel." Harrisburg, 2003.
- Pennsylvania Governor's Center for Local Government Services. "County Tax Report- Columbia County." 2009. *Municipal Statistics Report Viewer*. Web. 22 July 2009
- Pennsylvania Turnpike Commission. *Application to the Federal Highway Administration*. Philadelphia, 17 July 2008.
- . "Comprehensive Annual Report, Fiscal Years Ended May 31, 2008 and 2007." Pennsylvania Turnpike Commission. October 2008. Web. 23 June 2009.
- . "Toll Schedule- Cash Rates." 2009. Web. 11 June 2009.
- Pennsylvania Department of Transportation. *Mileage and Travel Selected Routes*. Harrisburg: Bureau of Planning and Research, Transportation Planning Division, 2007. Web. 15 February 2009.
- "Problems for Penn Pike in getting Feds OK to toll I-80 in legal counsel Memo." *Tollroad News*. 2 June 2009. Web. 15 June, 2007.
- Rice, W. Randy. Letter to Federal Highway Administration. 5 September 2007.
- Roknick, Michael. "Batting 1000: Development agencies focus on grand plan to acquire development ready property." [Mercer County Business Chronicle](#) May 2008: 12-15.
- S. Patz and Associates. [Market Analysis: Economic Recovery Strategy and Action Plan Clearfield County](#). Herndon, VA.: S. Patz and Associates, Inc., December 2002.
- "Sealy closing Strattanville plant." 9 August 2008. [Courier Express/Tri-County](#). Web. 28 May 2009
- Sealy Corporation. "Form 8-K." 5 August 2008. [Yahoo Finance](#). Web. 25 June 2009

State Tax Equalization Board. Common Level Ratios. 2009. Web. 22 July 2009

"Toll may put area trucking firms out of business." 10 November 2007. Courier-Express/Tri-County Sunday. Web. 6 June 2009

US Bureau of Labor Statistics. "Quarterly Census of Employment and Wages". 2007. Web. February 2009

—. "County Unemployment Data for 2003-2007." 2009. Bureau of Labor Statistics. Web. 4 June 2009.

US Census Bureau. "2006 County Business Patterns Economic Profile for individual counties." 2006. Web. March 2009.

US Dept of Commerce, Bureau of the Census. "Quick Facts 2009." Manufactured Housing Institute. Web. 29 June 2009

US Dept. of Commerce, Bureau of Economic Analysis - 2006. "County Profiles." January 2009. Center for Workforce Information and Analysis. Web. 4 June 2009

USDA National Agricultural Statistics Service. "County Profiles." 2007. The Census of Agriculture. Web. 2 June 2009

VanLandingham Consulting. "Economic Clusters in the Sandy Township, Falls Creek Borough, and City of DuBois." Cluster Analysis. June 2009.

Weaver, Ron. General Manager, Ritz-Trans. "Transportation of Manufactured Housing." Telephone Interview. 15 May 2009.

Weisberg, Arvin. "Discussion of expected toll costs to DuFerco-Farrell Corporation." telephone interview. 25 June 2009.

Wilbur Smith Associates. Preliminary I-80 Toll System, Rates, and Diversion Analysis. Technical Memorandum. Philadelphia, 2008.

Wilson, George W. "Note on the Elasticity of Demand for Freight Transportation." Transportation Journal (1978): 5-15.

## **APPENDIX**

Calculations for the manufactured housing industry assume that it costs six dollars per mile to ship one unit and that the average unit is shipped 250 miles, of which 100 miles are along Interstate 80 in Pennsylvania. The average distance shipped along 80 may be longer than this, but this accounts for the fact that modular housing manufacturers ship around one-fourth of the units produced in the region

to a location that is accessible via a route other than 80. The total cost of tolls includes the round trip cost for one oversized truck and two cars, which are required to accompany oversized loads. The impact on costs could be larger for a plant located closer to the western border of the state that ships most units east along 80 and smaller for a plant that ships most units along 80 to the closest border.

The calculations in table one assume that if consumers are moderately responsive the elasticity of demand is -2, while if they are highly responsive the elasticity of demand is -4. We call demand unresponsive if the elasticity of demand is close to minus one.

The responsiveness of production to price depends on the elasticity of supply. The more elastic is output with respect to price, the more a firm will reduce its output in response to a given sized reduction in price. Elasticity of supply is assumed to be between 0.5 and 2, with output considered unresponsive if the elasticity is 0.5, moderately responsive if the elasticity is 1 and highly responsive if the elasticity is 2.

According to Wilson, almost all estimates of elasticity of demand from empirical studies are below four in absolute value, with most below unity. Elasticities of demand faced by individual producers, however, are higher than elasticities of market demand. Wilson notes that even in the long run, elasticities of supply rarely exceed unity, except for a few commodities. Supply elasticities for agricultural commodities, for example, have been estimated to fall within a range of 0 to 2.

Economic theory tells us that to maximize profits, a producer will charge a price such that the elasticity of demand is greater than one. The results in table one assume that firms maximize profit by choosing output where marginal revenue equals marginal cost. Given the choice of output, firms sell for whatever price the market will bear. Marginal revenue is calculated along a straight-line demand curve with demand elasticity equal to the specified value at the initial output level.

Calculations for the impact of tolls on truckers assume that the trucking industry is competitive and truckers charge a price equal to the long run marginal cost for supplying their services. Data on marginal costs of trucking are from the American Transportation Research Institute.

### **Estimating the Impact of Tolls on the Philadelphia and Pittsburgh Metro Areas**

Calculations assumed that the following locations (as given by the 2002 Commodity Flow Survey Metropolitan Area for Philadelphia–Camden–Vineland) shipped to the Philadelphia region (unless noted below, the numbers used in calculation were the full number given)<sup>1</sup>:

- Chicago–Naperville–Michigan City, IL–IN–WI CSA (IL Part)
- Remainder of Illinois<sup>2</sup>
- Chicago–Naperville–Michigan City, IL–IN–WI CSA (IN Part)
- Remainder of Indiana<sup>2</sup>
- Michigan
- Minnesota
- Cleveland–Akron–Elyria, OH CSA
- Remainder of Ohio<sup>2, 3</sup>
- Remainder of Pennsylvania<sup>2</sup>
- Wisconsin

I assumed that 73.5% of total tons of goods shipped to Philadelphia are shipped via truck (Bureau of Transportation Statistics (USDOT) and U.S. Census Bureau). To calculate an estimated number of trucks that would be required to transport the goods to Philadelphia, I assumed that each truck carried 20 tons

<sup>1</sup> While some Midwestern locations may ship to Philadelphia via I-80, it is assumed that trucks from Iowa and west would avoid driving through Chicago-area traffic and avoid paying tolls in Indiana and Ohio by taking I-74 to I-70 to the Pennsylvania Turnpike, I-76, in Pennsylvania.

<sup>2</sup> The number of tons shipped from the “remainder of Ohio” is multiplied by 0.33 to account for the percentage of the state close to I-80. Tons from the “Remainder of Illinois” and “Remainder of Indiana,” are multiplied by 0.25 to account for the share of goods produced in those states that will likely be shipped along I-80. “Remainder of Pennsylvania” is multiplied by one-eighth to account for the relatively small share of the remainder of the state’s output that would likely be shipped to Philadelphia along part of I-80 rather than along other highways.

<sup>3</sup> To fill in the missing tons for “Remainder of Ohio,” I ran a regression of tons onto value of goods (through the origin) from the following locations: Idaho, Remainder of Illinois, Remainder of Indiana, Iowa, Kansas, Remainder of Michigan, Remainder of Minnesota, Montana, Remainder of Pennsylvania, Remainder of Washington, and Remainder of Wisconsin. Regression results are  $tons = 1.09 (value)$ ,  $n=11$ ,  $R^2 = 0.971$ .

of cargo. To keep the estimates conservative, I assumed that the trucks traveling on I-80 from the western edge of the state would only travel the first 160 miles along I-80 (they would then follow PA26, US 322 and I-76 to Philadelphia). For the trucks coming from the “Remainder of Pennsylvania,” I assumed that they only traveled an average of 80 miles along I-80. For northeastern suburbs of Philadelphia and metropolitan areas such as Allentown, trucks might continue for a greater distance along I-80 (possibly until they reach I-476 at mile 277 along I-80) and this would increase the cost of tolls, which would result in a greater impact to these areas.

I assumed the following locations (as given by the 2002 Commodity Flow Survey Metropolitan Area for Pittsburgh–New Castle) shipped to the Pittsburgh region (unless noted below, the numbers used in calculation were the full number given):

- Connecticut
- Maine
- Massachusetts
- New Hampshire
- New York–Newark–Bridgeport, NY–NJ–CT–PA CSA (NJ Part)\*\*
- Albany–Schenectady–Amsterdam, NY CSA
- New York–Newark–Bridgeport, NY–NJ–CT–PA CSA (NY Part)\*\*
- Remainder of New York\*
- Rhode Island
- Vermont

According to the Commodity Flow Survey, 51.7% of total tons of goods shipped to Pittsburgh are shipped via truck. To estimate the number of trucks that would be required to transport the goods to Pittsburgh, I calculated the total number of tons shipped to Pittsburgh via truck and divided that by 20 (assuming that each truck carries 40,000lbs, or 20 tons). The calculations are based on the assumption that 50% of all goods traveling along I-80 would travel south towards Pittsburgh by US-220/I-99 and the

\*Value of goods used in calculations from: “Remainder of New York” is multiplied by 0.75 because I estimated around three-quarters of the goods from the remainder of the state would travel along I-80.

\*\*I assumed that 75% of the goods coming from the New York City area entered I-80 at the easternmost point (the other 25% are assumed to travel via I-76). All other goods coming from the New England area enter I-80 from I-81.

other 50% would travel south via I-79. To get the estimate, the following distances were used in calculation:

- 291 miles from the easternmost portion of I-80 in Pennsylvania to I-79.
- 150 miles from the easternmost portion of I-80 in Pennsylvania to US-220.
- 240 miles from the intersection of I-81 with I-80 to I-79.
- 99 miles from the intersection of I-81 with I-80 to US-220.

### Calculation of Projected Toll Revenues

The toll rate for trucks was calculated as the average of toll rates for trucks of different sizes, based on the distribution of truck sizes on the Ohio Turnpike. Revenue was projected under several different scenarios that included assumptions about diversion rates and about whether tolls would be continuous based on distance traveled or a flat rate for each tolling station passed. Assumed rates of local diversion were from the Wilbur Smith Associates report. In the flat rate scenario, toll rates were multiplied by the average number of daily trucks and cars that passed through each section of I-80 (based on PennDOT traffic data for 2006) that was assumed to contain a tollbooth. We assume that the TPC chose tolling stations to minimize local diversion.

The continuous toll rate scenario calculated tolls based on average daily vehicle miles traveled for trucks and cars over the entire length of 80. In this scenario, the total percent of trucks and cars diverted was all that mattered.

**Table A-1. Projected Toll Revenues for Various Scenarios.**

Assumptions	Trucks	Cars	Total
Flat rate- no diversion	\$313,286,760	\$159,485,737	\$474,067,765
Flat rate minus local diversion	\$294,071,193	\$150,308,995	\$445,597,669
Flat rate minus local & 1% long distance diversion	\$290,938,326	\$148,714,138	\$440,856,991
Flat rate minus local & 2% long distance diversion	\$287,805,458	\$147,119,281	\$436,116,313
Flat rate minus local & 5% long distance diversion	\$278,406,855	\$142,334,708	\$421,894,280
Continuous rate- no diversion	\$344,560,188	\$160,686,186	\$506,630,610
Continuous rate minus 5% diversion	\$327,332,179	\$152,651,876	\$481,299,080
Continuous rate minus 10% diversion	\$310,104,169	\$144,617,567	\$455,967,549
Continuous rate minus 15% diversion	\$292,876,160	\$136,583,258	\$430,636,019
Continuous rate minus 20% diversion	\$275,648,151	\$128,548,949	\$405,304,488