Analysis of Public Benefits for Pennsylvania Freight Rail Funding

FINAL REPORT

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By

Cambridge Systematics, Inc.

COMMONWEALTH OF PENNSYLVANIA
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Analysis of Public Benefits for Pennsylvania Rail Freight Funding

Task 1 – Literature Review and Interviews

prepared for

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16. Abstract Building on best practices from other states and Pennsylvania's existing evaluation processes, this project developed an assessment tool to help the Pennsylvania Department of Transportation (PennDOT) analyze the public benefits resulting from the investment of public funds in support of private freight-rail investments. This report describes the development and use of the tool (Pennsylvania Rail Benefits Estimator) to evaluate grant applications for freight rail funding.			
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Executive Summary

The Commonwealth of Pennsylvania provides significant state funding to support freight rail investments through its Rail Freight Assistance Program (RFAP) and Rail Transportation Assistance Program (Rail TAP). The freight rail investments promote and sustain economic development and a balanced transportation system in which rail is competitive with other modes for goods movement. Since the inception of these programs in 1984, the Commonwealth has followed state statute to evaluate the grant applications of freight railroads, shippers, and municipalities. The evaluation procedures have considered viability, cost, and compatibility with state goals. A project selection committee consisting of PennDOT staff reviews grant applications using a scoring sheet to reflect desired outcomes.

While this process has historically selected worthy projects based on available information, through this study the Pennsylvania Department of Transportation (PennDOT) sought to sharpen its decision-making process by developing a rail investment tool to estimate public benefits of the projects and to provide a benefit-cost ratio. The tool, called the Pennsylvania Rail Benefits Estimator (PRBE), enhances the project selection committee's abilities to systematically analyze projects. PennDOT worked with the consulting firm of Cambridge Systematics, Inc. (CS) to create the PRBE, a spreadsheet-based tool that estimates public benefits associated with each grant application.

The PRBE was designed to take advantage of the information that grant applicants have traditionally provided to PennDOT. However, during the study PennDOT amended the application to collect additional data to match the model's capabilities. The revised grant application seeks more detailed information on car loadings, commodities, routes, and employment. Using information provided by grant applicants, PRBE provides estimates of several categories of public benefits and a summary benefit-cost ratio for each grant application. For many projects – especially new connections or expansions of service – the public benefits largely result from the shift of trucks from Pennsylvania highways to the rail system. For projects that maintain rail service, the benefits largely result from the avoided rail-to-truck diversion to the highway system. The benefits associated with growth or maintenance of rail mode share include reduced highway maintenance costs, lower highway safety costs (e.g., lower truck vehicle-miles-traveled), and lower emissions. Private shippers receive the benefit of lower rates on rail than truck. The tool also estimates the direct and indirect effects on employment, including short-term (construction) and long-term (railroad) jobs created or maintained in the Commonwealth.

During 2011, PennDOT will integrate the PRBE into the grant selection process. Once fully implemented, the PRBE will compliment other inputs to the grant award process by enhancing the Commonwealth's ability to measure public

benefits. With the PRBE in place, Pennsylvania joins a select number of states that have institutionalized methods to estimate public benefits. Ultimately, the tool will help to deliver a consistent and systematic evaluation approach for each grant application.

1.0 Introduction

Through this project, the Pennsylvania Department of Transportation (PennDOT) has developed a benefit estimation tool to more systematically analyze public benefits of freight rail investments. The methodology to calculate the benefits of freight rail investments builds on current procedures used by PennDOT to evaluate grant applications for its Rail Freight Assistance Program (RFAP). To institutionalize a consistent and systematic estimation approach for each grant application, this project has developed a spreadsheet-based tool that accounts for important evaluation criteria.

This report provides background on the development of the tool and instructions on its use and maintenance. Flexibility was designed into the tool to provide PennDOT with the ability to use it and its underlying methodology in the assessment of future grant applications (beginning spring 2010). The report is organized into the following sections:

Section 2.0 –Literature Review and Peer State Experience – Through research and interviews with peer states and Pennsylvania freight rail grant applicants, this section documents the procedures and attitudes of participants and provides initial direction and background on the development of the tool.

Section 3.0 – Model User Guide – This section contains step-by-step instructions on the use of the model and background information explaining how and why the model functions.

Appendices – The appendices contain additional information related to the outreach interviews conducted for the study.

2.0 Literature Review and Peer State Experience

The objective of this section is to assemble the most relevant lessons learned from peer states and national research to build a decision-making framework to guide the rest of the project. To accomplish this objective, this consulting team sought to identify the most recent and relevant examples of state freight rail benefits assessment by analyzing the following:

- The current PennDOT project evaluation approach;

- Relevant national research on state rail benefits assessment;

- Practices of "peer" states with existing freight rail funding programs and project evaluation programs; and

- The experience of Pennsylvania's freight rail funding applicant pool consisting of railroads and shippers.

During early 2010, the consulting team collected background information on Pennsylvania's current freight rail grant application evaluation procedures and the procedures and tools used by peer states to inform public investment decisions. As a first step, the consulting team reviewed the current Pennsylvania process and performed a literature review of national studies on best practices. Finally, the consulting team conducted interviews with state officials to learn about relevant approaches that could be applied to the PennDOT public benefits model.

2.1 PENNSYLVANIA APPROACH

The consulting team conducted in-person interviews and reviewed state documents to develop a base understanding of PennDOT's current freight rail funding programs and project evaluation approach. The following paragraphs summarize the current evaluation approach.

Rail Freight Preservation and Improvement Act

With the enactment of the "Rail Freight Preservation and Improvement Act" in 1984, the General Assembly authorized PennDOT to provide grants to support operations and construction of rail facilities. Applicants include railroads, municipalities, shippers, or other organizations. A wide range of projects are eligible for state funding, including planning, engineering, property acquisition, and construction of rail facilities. During the initial decade of the program, grants tended to support accelerated maintenance of rail facilities to bring infrastructure up to current operating standards. More recently, as the Commonwealth's

railroad maintenance needs have reached relative maturity, the focus of state awards is shifting toward capital projects, including upgrades to 286,000-pound track and spurs to provide access. The exception to this trend is continued state support of some maintenance projects that would otherwise be deferred.

PennDOT utilizes two programs to disburse freight rail funds: 1) The Rail Freight Assistance Program (RFAP); and 2) the Capital Budget Transportation Assistance Program (TAP). RFAP currently is funded at $10.5 million annually and provides up to 70 percent match funding for individual projects up to $700,000. The focus of the RFAP grant awards is on short line and regional carriers to preserve essential rail service and to stimulate economic development. The TAP program seeks to fulfill a similar mission, but with a $20 million annual allocation and a focus on larger projects. The key difference between the programs is that TAP projects must receive a line item in the current Capital Budget Act to receive funding and RFAP programs do not.

Current Evaluation Process

The following text box summarizes the steps in PennDOT's current project evaluation process. The following sequence is related to the RFAP but all steps also apply to the TAP.

> **Pennsylvania Rail Freight Assistance Program – Project Evaluation Flow**
>
> - Application submitted via "dotGrants."
> - Staff review application and conduct site visit to ascertain viability and cost.
> - Applicants provide 20-minute overview presentation to the PennDOT project selection committee.
> - Staff score projects based on site visit and compatibility with state goals (e.g., 286,000 network, goals, and vision).
> - Bureau presents recommended projects to the Program Management Committee (PMC) and the State Transportation Commission (STC) for approval.
> - Grants are awarded and the project work is completed.

The data used to evaluate the projects are supplied by applicants, including job creation and car loadings for the last three years. PennDOT does not provide the scoring criteria to applicants to minimize the submission of applications skewed to achieve a certain result. To inform the fund distribution process, PennDOT staff score each project based on application evaluations, site visits, and applicant presentations. The score considers project impact on network operations (safety, capacity), state of good repair, economic development, and other issues such as Pennsylvania connectivity to the national network.

To monitor the performance of projects, PennDOT requires the recipients to provide records of car loadings for a period of five years after project completion.

Recipients are expected to achieve at least 50 percent of the estimated increase in carloads provided to the Commonwealth in the application.

2.2 NATIONAL FINDINGS

Studies conducted by national organizations, including the Transportation Research Board highlight a growing body of information and instruction on freight rail benefits analysis. These studies are relevant to this project because they provide observations on rail benefit/cost approaches, including common problems, challenges, and approaches.

Summary of National Studies

Most of the approaches described in national studies contain common elements and use similar approaches for calculating the benefits. For example, most approaches rely on changes in truck vehicle-miles traveled (VMT) to calculate benefits related to safety, highway maintenance, and logistics cost savings. Still, no singular approach emerges from the literature on the evaluation methodology to estimate public benefits of rail transportation investments. The following examples excerpted from two key studies: 1) AASHTO's Freight-Rail Bottom Line Report (2003); and 2) NCHRP Report 586 – Rail Freight Solutions to Roadway Congestion (2007) highlight these observations.

Over the last seven years, AASHTO's Freight-Rail Bottom Line Report (2003) has proven to be an influential document on the benefits of freight rail setting the stage for increased national interest in freight rail benefits. It identifies and esti-mates several categories of public benefits, including:

- Transportation System Capacity and Highway Cost Savings;

- Economic Development and Productivity;

- International Trade Competitiveness;

- Environmental Health and Safety; and

- Emergency Response (system redundancy).

In 2007, NCHRP Report 586 – Rail Freight Solutions to Roadway Congestion summarized key observations drawn from national case studies on the approaches of public agencies to rail freight benefits analysis:

- The benefit/cost analysis must show that total project benefits exceed total costs, using the time value of money to compare current and future costs.

- Agencies also analyze nonmonetary aspects of benefits and costs and have developed many ways to quantify nonmonetary factors.

- No singular methodology emerges for assessing projects with multiple categories of benefits and costs.

- The weighting of factors varies from agency to agency, consistently requiring political input.

- Public agencies are concerned with the distribution of benefits; to resolve distribution or equity issues requires approval by political process.

- All benefits approaches are subject to debate concerning the types of projects analyzed and how public-private projects should be structured.

Evolution of Federal Standards

Recently, the national conversation about freight rail benefit/cost analysis has shifted to a discussion of approaches to and compliance with Federal standards. Through the recent round of Transportation Investment Generating Economic Recovery (TIGER) and American Recovery and Reinvestment Act (ARRA) grant making, the U.S. Department of Transportation (U.S. DOT) required states to identify benefits of projects. The TIGER process, codified in the Code of Federal Regulations, provided detailed methodological guidance on benefit/cost analysis, including employment multipliers and discount rates to capture time value of money. The ARRA process for High-Speed Intercity Passenger Rail grants was less specific. During future rounds of funding, these processes will likely become more standardized, providing a potential template for states with interest in Federal dollars for freight rail projects.

2.3 PEER STATE FINDINGS

To understand how other states evaluate the public benefits of freight rail projects, the study team interviewed several peer states. The selected states were Washington, Florida, Louisiana, Oregon, and Virginia. Each of them has developed methods – at varying levels of complexity – to identify public benefits of freight rail projects. Of these five states, Virginia's program is the largest and possibly most complex, funded by annual dedicated revenues across three programs. By contrast, Louisiana does not have a funding program but has evaluated projects in anticipation of a future program. For each state, this report summarizes the freight-rail funding program and current evaluation process to provide comparisons and lessons to this study.

Washington

Freight Rail Funding Program

The Washington State Department of Transportation (WSDOT) administers two funding programs that support freight rail projects: 1) the Washington Rail Bank ($5 million every two years); and 2) the Freight Rail Assistance Program ($2.75 million per year). Because the state constitution prohibits transfer of public funds to private enterprises, WSDOT cannot provide funds directly to railroads.

Consequently, the applicants for freight rail funding assistance are public agencies such as municipalities or special districts – such as a port districts.

Benefits Methodology

To analyze the funding applications, WSDOT uses a spreadsheet-based benefit/cost analysis (CBA) methodology. The State developed the methodology based on guidance in the 2007 statewide Freight-Rail Capacity Study. Over a period of six to nine months, the State developed a benefit/cost mechanism for its Legislature. WSDOT utilizes two versions of the CBA tool: 1) a "light" model that analyzes information from its two regular grant or loan programs; and 2) the full model that WSDOT applies to larger projects. The process can take anywhere from a day to several months depending on the complexity and size of the project and the availability of data. Key features of the process include:

- **Evaluation Flow –** WSDOT uses applicant-supplied information to calculate the CBA internally. WSDOT uses the analysis to provide a recommended list to the Legislature, which makes the final determination. Once the projects are approved, the Legislature directs WSDOT to implement them.

- **Annual Updates –** Each year, WSDOT updates the approach to reflect current needs. The model has the ability to give more weight to certain variables – including Legislative preference, industry, or commodities.

- **State Agency Coordination –** WSDOT works closely with the Department of Commerce (DOC) to evaluate the projects. DOC provides input on the approximately 25 percent of the evaluation having to do with economic variables such as job creation. Depending on the nature of the application, other state agencies are involved, including the Department of Agriculture.

- **Applicant Training –** The organizations applying for funding may not know how to provide the data necessary to complete the application. To assist them and to build capability statewide, WSDOT conducts about six workshops each year to provide potential applicants with instruction. This workshop circuit is a response to the poor quality of applications received in the past.

- **Performance Measurement –** To audit projects, WSDOT requires applicants to provide car loadings with an indication of "empty or full" and date. No origin-destination data are required.

During the development of the CBA approach, the greatest challenge was getting the political buy-in from the House and the Senate to support the procedure. The Legislature continues to use earmarks to advance some rail projects but the political culture is evolving to expect that a CBA is completed. In some cases, the legislators are suggesting to lobbying agents that a CBA must be completed by WSDOT for the project to receive serious consideration.

Florida

Freight Rail Funding Program

The Florida Department of Transportation (FDOT) selects freight rail projects for state funding from its surface transportation program and its Strategic Intermodal System (SIS) program. The state constitution, by interpretation, requires a positive benefit/cost result for public funds to support a private rail investment. The annual allocation for both programs has varied over time, but has recently exceeded $100 million. The State typically spends up to 15 percent of its transportation dollars on nonhighway modes (rail, port, air), but this percentage is expected to increase as the State places greater emphasis on large commuter and high-speed rail projects. Consequently, the funding for freight rail projects is expected to decrease slightly over the next several years.

Past projects have focused on connectivity (e.g., the potential impact of a short line connection to another mode and the ability of the project to improve connectivity), 286,000-pound upgrades, and bridge rehabilitation. The State would fund industrial spurs, but there have been very few viable applications. Successful short line applications receive a 75 percent state match while Class I and regional carriers receive 50/50 match funding.

Benefits Methodology

The State uses several evaluation criteria and tools to make its rail investment decisions. First, FDOT makes a determination of how well each project meets the policy objectives of the State, including the Florida Strategic Intermodal System (SIS) goals (see below). This determination traditionally relied on the judgment of FDOT staff but in the future the Department will transition to a prioritization tool to account for policy and performance measures to analyze project fit. The State employs a slightly different set of prioritization criteria for passenger rail than freight rail because those programs are funded from different sources. For example, there is a more extensive list of prioritization criteria for commuter rail than for freight.

Florida Strategic Intermodal System (SIS) Goals

1. **Safety and Security –** A component of external impacts;
2. **System Preservation –** Not explicitly modeled, but can be considered an external impact and a future transportation impact;
3. **Intermodal Mobility –** A component of transportation impacts;
4. **Economic Enhancement –** The same as economic impacts; and
5. **Quality of Life –** A component of transportation impacts (congestion mitigation), external impacts (environmental and safety), and economic impacts (jobs and economic growth).

Once the projects are prioritized against state objectives and measures, the State uses a benefit/cost model – the Florida Rail Investment Calculator (FRIC) as a last check to make sure the project has a positive benefit/cost ratio. The software calculates the benefit/cost ratio for each project, considering the factors listed below and the time value of money.

Florida Rail Investment Calculator Factors

Transportation Impacts:
- Avoided Highway Maintenance Costs;
- Shipper Logistics Costs; and
- Highway Delay at Rail-Highway Grade Crossings.

Economic Impacts:
- New or Retained Jobs; and
- Tax Increases from Industrial Development.

External Impacts:
- Highway Safety Improvements; and
- Environmental Quality Improvements.

Once the FDOT Rail Office has made its recommendation, the Department integrates the recommended rail projects into a larger transportation project list. The State has a good track record with railroad participation in the process. Historically, the freight railroads have provided the information necessary to evaluate the policy and performance dimensions of a project. The process is not onerous because the State does not ask for complete project data to run the benefit/cost calculator unless the project already has been considered worthy of matching funds (because the calculator is a final check to ensure positive benefit/cost ratio).

The State has been seeking a way to audit and verify the project success to know, for example, how well a railroad has performed over a five-year period. Ultimately, the State has not pursued auditing because of the variability in economic cycles that periodically dampen carload activity.

Louisiana

Louisiana currently does not have a dedicated source of freight rail funding (outside of port properties), but the State has developed an evaluation methodology in anticipation of the formation of a new rail funding program. For several years, the Louisiana Department of Transportation (LADOT) has been poised to advance a rail program with the Legislature that would fund investments and would require a project evaluation. Enactment of that program has been stalled by Hurricanes Katrina and Gustave and the State's requisite attention to restoration. If enacted, the new program would change Louisiana's constitution to allow for state investment in freight railroads, which currently is limited to rail facilities in ports.

In preparation for the potential rail program, the State evaluates projects submitted by the railroads on an annual basis. Most of the projects were introduced in the State's last rail plan, supplemented with additional information from the railroads to prioritize them. Because legislative action has lagged, LADOT has not added any new "pure rail" projects, but has included some rail projects within the boundaries of ports (because they are eligible for funding). The State continues to reprioritize the projects to account for minor changes in carload volumes or political views. The project list has remained the same for the last few years.

Benefits Methodology

To run the benefit/cost model, the State worked with the railroads to acquire data on the number of cars, trucks, and origin-destination patterns within the State. In most cases, the railroads have provided general information and LADOT has exercised professional judgment to populate its spreadsheet model. Most of the projects requested are related to short line improvement to 286,000-pound operating standards. In the future, when project funding is available, the State may apply the model with more rigor and would implement a more sophisticated process to estimate project impacts.

Oregon

Freight Rail Funding Program

The Oregon Department of Transportation (ODOT) administers *Connect*Oregon, a lottery-bond-based program to improve the State's multimodal transportation system. The program was authorized in 2005 by the Oregon State Legislature with the goal of ensuring a strong, diverse, and efficient transportation system that "better integrates the components of the system, improves the flow of commerce, and removes delays." The program funds improvements to all modes of the State's transportation system, including freight rail, passenger rail, urban transit, air, and marine. One of its chief desired outcomes is the improvement of intermodal connections between the highway system and other modes. Since its inception in 2005, the *Connect*Oregon program has funded a total of $300 million in projects, nearly 50 percent of which are rail projects. Eligible applicants include firms, agencies, cities, ports, counties, and others.

Benefits Methodology

Applications are reviewed by stakeholders, transportation experts, local residents, and then approved by the Oregon Transportation Commission. The Legislature has approved $100 million for the program every two years since 2005. No less than 10 percent of the funds must be awarded within each of five state transportation regions contingent upon the submission of qualified applications in each region.

Once the applications are submitted, ODOT staff review them for completeness and feasibility and forward those that qualify to the five modal and five regional committees for review and ranking (e.g., Rail Advisory Committee).

An important part of the review process is a calculation of economic benefits by an independent consultant contracted by ODOT. The consultant develops economic benefits estimates for each project based on performance metrics provided in the application (e.g., construction jobs; direct and indirect permanent jobs; impact on regional (or state) unemployment; project cost). In addition to the benefit/cost calculation, the review committees score projects using the following evaluation criteria:

*Connect*Oregon Evaluation Criteria

- Project reduces transportation costs for Oregon businesses or improves access to jobs and sources of labor.
- Project results in an economic benefit to the State.
- Project is critical link in Oregon's transportation system that will measurably improve utilization and efficiency.
- Ability of the applicant to fund the project from any source other than the Multimodal Transportation Fund.
- Construction Readiness.

Virginia

Freight Rail Funding Program

The Virginia Department of Rail and Public Transportation (VDRPT) administers three programs that support freight-rail investments: 1) The Rail Enhancement Fund; 2) Rail Industrial Access Grants; and 3) Rail Preservation Grants. The Rail Enhancement Fund (VREF) provides a 70/30 funding match for all types of passenger or freight rail projects. The Rail Industrial Access Grants provide assistance to shippers or freight railroads to connect rail-traffic-generating facilities to the rail network, either by improving existing rail infrastructure or by providing new assets to reach shippers (e.g., industrial sites). Applicants may include localities or businesses. The Rail Preservation Grants program supports short line railroads in the Commonwealth.

Benefits Methodology

The Commonwealth maintains three variations of its benefit/cost model customized to each of the respective programs: 1) Rail Enhancement; 2) Industrial Access; and 3) Rail Assistance. The benefit/cost model is part of a broader evaluation conducted by VDRPT staff and data on current and future carloads (or intermodal units); trucks diverted; and mileage in Virginia. For the VREF program, applicants must complete an Excel spreadsheet template and submit it

with their written narrative applications. For the Rail Preservation program, applicants must furnish basic information on car loadings and job creation. Upon receipt of the applications, staff check for completeness and evaluate according to qualitative policy and regulatory criteria. A contractor subsequently conducts a benefit/cost evaluation using a proprietary model developed jointly with the Commonwealth. VDRPT utilizes a consultant to run the model due to lack of agency staff and the desire for an independent evaluation of the economic portion of the application. While the inner workings of the VREF model are not publicly transparent, the approach to the Rail Preservation Grant benefit/cost evaluation is patterned on the Federal Railroad Administration (FRA) 1990 Local Rail Freight Assistance Program (LRFA) guidance.

- Establishing the project alternative;

- Determining the project costs;

- Determining the null alternative;

- Using the standard 10-year planning horizon;

- Using the FRA published discount rates;

- Calculating transportation efficiency benefits;

- Calculating secondary benefits;

- Calculating salvage value (if abandoned); and

- Calculating the benefit/cost ratio.

Once the benefit model is complete, staff recommend applications meeting the basic requirements – including a benefit/cost ratio exceeding 1.0 – to the Rail Advisory Board (RAB). The RAB subsequently reviews and recommends projects to the VDRPT Director for further review and recommendation. The process culminates with the introduction of projects recommended by the VDRPT Director to the Commonwealth Transportation Board (CTB) for final review and obligation of state funds. In addition to the benefit/cost assessment, the Commonwealth considers the following criteria for VREF projects.

Virginia Rail Enhancement Fund Project Considerations
Can/Does the project….

- Meet the benefit/cost ratio (1:1) standard and does it need accelerated assistance.

- Address needs in state, regional, local plans.

- Enhance competitiveness, including joint access to major shippers.

- Be built quickly – within the six-year program of the state – and limit long-term liability.

- Leverage public funds by drawing on sources of private financing.

- Protect the Commonwealth's public interest in private properties (will the project be used for the stated purpose over its proposed life span.

- Contribute to the effectiveness of the entire transportation system (intermodalism).

- Apply 90 percent of funds to capital improvements (limiting planning and engineering to 10 percent).

The benefits are valued over 20 years and the Commonwealth strictly monitors performance of the metrics of railroads participating in its programs. Applicants are required to report traffic annually and the State conducts audits approximately every 5 years. In addition, VDRPT deploys contracted field auditors to estimate rail traffic utilizing the state-financed facilities. If the State finds that a project is not meeting the forecast traffic of the applicant, the applicant must return the proportional share of funding measured by the nonachieved traffic level pro-rata plus interest.

Under the Rail Preservation Program, the Commonwealth retains an ownership share for every state dollar invested until the interest is repaid or the useful life of the asset has been reached.

Summary of State Approaches

Project evaluation approaches vary in technical detail but generally rely on public benefits analysis as one component of a multifaceted selection process. Similarities among the approaches include the following:

- All five states utilize a formal public benefits measurement approach.

- None of the states rely on a public benefits approach as the sole element in the evaluation, but the evaluation is a required component of the overall project prioritization and selection process.

- In each state, the evaluation process has evolved over time to become more standardized but not necessarily more complicated. The Florida model, for example, is relatively simple. In contrast, Virginia's models are more complex.

- States tend to guard their models closely, using internal staff or contractor resources to estimate benefits from applicant-supplied data. None of the states allow the applicants to run the model.

- Each of the states requires applicants to provide basic information on the forecast change in freight rail traffic (carloads or intermodal units) although the period of performance varies by state.

- States express the change in traffic as a truck VMT differential to produce monetized savings in some combination of the following savings categories: logistics costs, safety, air quality, and highway maintenance.

- All five states use applicant data and their own factors to estimate job creation as part of the economic analysis.

- In all cases, a positive benefit/cost ratio is required for funding eligibility.

- States tend to measure the same types of public benefits – largely relying on the change in VMT of forecast truck-to-rail diversion – and job creation (short- and long-term). The factors used in the respective analyses may differ, although some states are building model capability to produce benefit/cost ratios using the TIGER factors required by U.S. DOT.

Table 2.1 on the following page arrays the approaches of the respective states interviewed for this project.

Table 2.1   Summary of State Freight-Rail Funding Approaches

Program Characteristics	Washington	Florida	Louisiana[a]	Oregon	Virginia
Program Purpose					
Rail Preservation	◆	◆	◆	◆	◆
Economic Development	◆	◆	◆	◆	◆
Other (e.g., Congestion Mitigation)	◆	◆		◆	◆
Carrier Eligibility	No	Yes	No	Yes	Yes
Funding Sources					
Total Freight Rail Program Funds (Annual)	$2.5M	~$50-$100M	N/A	$50M[b]	
Dedicated Funds		◆	N/A		◆
Legislative Appropriation (Annual or Biennial)	◆	◆	N/A	◆	
State/Recipient Funding Match Requirements	Up to 100%; Local match preferred	50/50 Class I, II; 75/25 Short lines	NA	80/20	Up to 100%; VREF is 70/30
Public Benefits Estimates					
Developed by State DOT Staff	◆	◆	◆		
Developed by Contractor				◆	◆
Performance Measurement Data					
Units (e.g., Carloads or Intermodal Units)	◆	◆	◆	◆	◆
Modal Shift (e.g., Truck to Rail ∆ VMT)	◆	◆	◆	◆	◆
∆ VMT Benefits (Logistics Costs, Safety, Highway Maintenance)	◆	◆	◆	◆	◆
Job Creation	◆	◆	◆	◆	◆
Post-Award Auditing	Annual car loadings		N/A		Annual car loadings and field audits

[a] Louisiana maintains an updated project evaluation list to remain prepared for potential state rail funding.

[b] Oregon provides $100 million every two years; theoretically all the money is available to freight rail but the actual awards are less than 50 percent of the total.

2.4 STAKEHOLDER INPUT

Overview

Telephone interviews were conducted with a sample of Pennsylvania railroads, shippers, and development organizations to understand their perspectives on the current state freight rail funding evaluation and award process. To alleviate concerns about sharing confidential information and to encourage candor, the responses are anonymous. Nearly every interviewee expressed appreciation of the state funding program with some revealing that their firm would not have survived without it.

Stakeholder Telephone Interviews

To ensure consistency, a script was used to conduct the telephone interviews. Interviews were conducted over the course of several weeks and uncovered the opinions of stakeholders on such topics as:

- The strengths and weaknesses of the current funding process;

- What factors they consider to be the most important in the evaluation of competing projects; and

- Their ability to provide the information required to measure benefits if it were asked for in the application.

The script used to guide the telephone interviews is contained in the Appendix of this report.

2.5 PROFILE OF RESPONDENTS

Nine railroads, one shipper, and one not-for-profit economic development organization participated in the interview process. Each interviewee had applied for funding from the Rail Freight Assistance Program (RFAP) in the past and all but one also had applied for funding through the Capital Budget Transportation Assistance Program. Most of the respondents (6 of 11) indicated that they were highly successful in receiving funding through the program. Five of them said they had a mixed success rate.[1] A common feature among the railroads interviewed is a reliance on internal staff to complete the applications (8 of 9). The two nonrailroad respondents interviewed use outside engineers for design work and cost estimates.

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[1] Respondents classified in the "mixed success" category responded with phrases such as *50-50, we win some and we lose some, somewhere between 40 and 60 percent,* etc. when asked how successful they have been at receiving funding for projects they have submitted.

2.6   SUMMARY OF KEY FINDINGS

Overall Comments

During the interview process, many respondents expressed unsolicited praise for the program. Some (paraphrased) comments include:

- It's a fabulous program that works well. It's clear that everyone (from the State) involved in the program, from the top down, believes in freight rail;

- We are all pleased that we have this program. It's a good program – much better than most states;

- They (the State) do a great job. We're just glad to have a program like this in Pennsylvania. If you lay out a good project, it will get approved; and

- Other states should look to Pennsylvania because they have done a good job funding rail projects – give them kudos on legislative support.

Project Types

The most common type of projects that the respondents are interested in receiving funding assistance for are tie replacement and rail upgrades (eight and seven mentions, respectively). This is followed by bridges (four mentions) and sidings, spurs, and track extensions (four mentions).   (See Table 2.2 and Figure 2.1 below.)

Table 2.2   Project Types

Project Type	Number of Mentions
Ties	8
Rail	7
Bridges	4
Sidings/Spurs/Track Extensions	4
Tunnels	1
Yard Upgrades	1
Undercuttings on Road Crossings	1
286,000-Pound Upgrade	1
Main Line Improvements	1
Reactivation of Abandoned Lines	1

Figure 2.1   Project Types
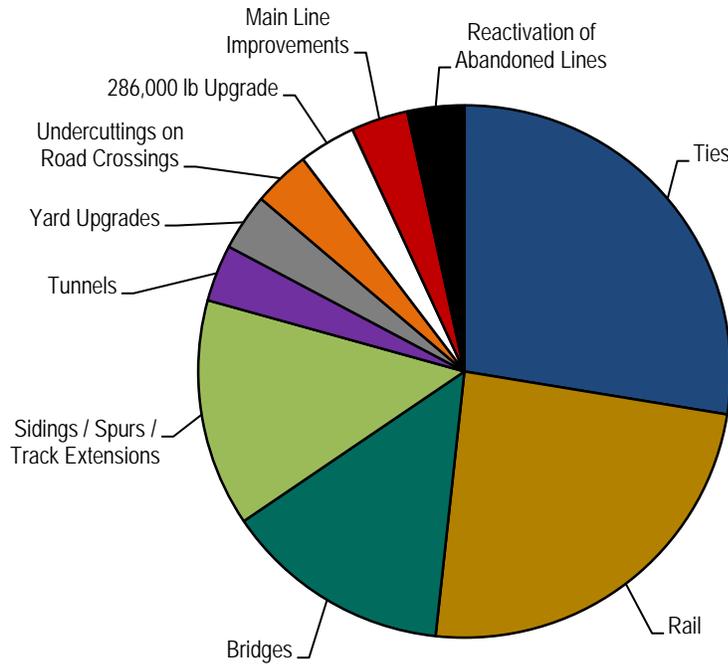
Current Project Evaluation Process

Three respondents said that the ability to give a 20-minute presentation about their project was a key strength of the current evaluation process. They felt this provided an opportunity to convey the importance of the project in a way that cannot be replicated within an application form. Other perceived strengths include the focus on jobs and carloads (two mentions), the overall fairness of the process (two mentions), site visits by Bureau of Rail Freight personnel (one mention), and the separation of maintenance and capital funds into different programs (one mention). See Table 2.3 below.

Table 2.3   Strengths of Current Evaluation Process

Project Type	Number of Mentions
Ability to Present Project in Person	3
Focus on Jobs and Carloads	2
Fairness of Process	2
Site Visits	1
Separate Funds for Maintenance and Capital	1

Comments about how the evaluation process could be improved were varied. Almost everyone said that the level of funding should be increased. Most of the improvement suggestions are related to how funding is distributed. A common perception is that certain types of railroads or organizations with the resources to fund their own maintenance were drawing funds out of the pool leaving less for those that really need it. A variant on this is the idea that railroads that serve more and larger customers should receive more funding than those who serve fewer and smaller customers. Everyone who provided these comments requested that they not be attributed to their organization. Some paraphrased comments are listed here:

- The greatest fault of the program is that some railroads with deep pockets get large awards. The Class I and Regional Railroads get million dollar grants and the small railroads struggle to get a few hundred thousand dollars.

- The program should provide proportionally more money to the larger railroads.

- The program should focus on private railroads and not those that are owned by government agencies. These railroads have taxing authority and should use that to fund their maintenance.

- The program should focus more on helping local community rail lines and less on helping private rail lines.

- The Class I railroads are large, publicly traded companies that should be able to fund their own maintenance – they shouldn't take money out of state funds that should go to smaller railroads that really need the help.

- It appears that projects for operating railroads and tourist railroads get funding ahead of the freight railroads. Also shippers seem to get funded ahead of freight railroads as well.

- It seems that too much money goes to the Class Is and the very large short line conglomerates that have the cash to fund their own improvements. This takes money out of the pool that could better be used by the short lines that need it more.

The table below shows the breakdown of suggestions for how to improve the project evaluation process. The comments in the bulleted list above are grouped together under the *Improve Fairness of Funding Allocation* in Table 2.4.

Table 2.4   Evaluation Process Improvement Suggestions

Type of Improvement Suggestion	Number of Mentions
Improve Fairness of Funding Allocation	7
Streamline Application Process	2
Increase the Number of Site Visits	2
Clarify the Evaluation Criteria and Weighting Used	1
Ensure Even Distribution of Funds Across the State	1
Consider Previous Track Record of Delivering Projects	1
Consider Financial State – Ensure Applicant Can Deliver	1

The other two suggestions that received more than one mention are related to streamlining the application process (two mentions) and increasing the number of site visits (two mentions). The respondents who mentioned the site visits stated that, similar to a presentation, a site visit allows more information about the project to be conveyed. They said it was very important to be able to actually show what the problems are and how they will be addressed with funding from the State.

In addition to asking how the current evaluation process could be improved, the respondents were asked about the application submittal process. Seven of the respondents either had no suggestions or said that the application process works well as it is. The other four respondents provided these suggestions for improvement:

- The window for submitting applications should be extended.

- It would be helpful to be able to scroll through the pages instead of going into and out of them one at a time.

- It would be an improvement to be able to print the application.

- The passwords expire too quickly – they should last longer.

Project Implementation

Respondents were asked what difficulties, if any, they had in implementing projects after funding was approved. Most said they had no difficulties (seven mentions). Of the remaining, two indicated that if the timing of the funding decision is made too late in the year, construction must often be delayed due to weather and contractor availability. Another respondent indicated that the 10 percent retainage and 60-day payment schedule requirements cause suppliers to increase their fees. Another railroad interviewee said that staying within the cost guidelines in an environment of rising prices can be a challenge. (See Table 2.5)

Table 2.5   Post Award Problems with Project Implementation

Problem	Number of Mentions
No Problems	8
Timing of Funds	2
Retainage and 60-Day Repayments from the State	1
Cost Management	1

Providing "Haul Distance" Information on Future Applications

When asked about the possibility of providing "Haul Distance" information on project funding applications most respondents said it would present some difficulties for them. Five respondents said either that they don't track this information or that it's difficult to produce. Two said that they can easily provide distance hauled on their system but cannot say how far anything moves after the transfer to a Class I railroad. Two indicate that they can provide this data but are concerned about confidentiality, and two said they would have no trouble providing it. (See Table 2.6 below).

Table 2.6   Level of Effort Required to Provide Pennsylvania Haul Distance

Problem	Number of Mentions
Difficult to Produce the Data	5
Can Provide Distance on their Network but Not on Class I Network	2
Can Provide but Concerned about Confidentiality	2
No Trouble Providing this Data	2

An overview matrix of all interviews is shown appendices of this report.

3.0 Model User Guide

The Pennsylvania Rail Benefits Estimator (RBE) is a spreadsheet-based model developed for the Pennsylvania Department of Transportation (PennDOT) to support investment decision-making. The model was developed for PennDOT in 2010 for use by the Department to evaluate grant applications to the Commonwealth's two major freight rail programs: 1) Rail Freight Assistance Program (RFAP); 2) and the Capital Budget Transportation Assistance Program (TAP). During 2011, PennDOT will begin to use the Rail Benefits Estimator to evaluate grant applications for the RFAP program. In the future, PennDOT also will use the tool to assess TAP applications.

3.1 GRANT APPLICATIONS

The primary sources of information for the model are the grant applications for RFAP and TAP available through the dotGrants on-line system. Once a prospective applicant registers to use the dotGrants system, they can enter information on-line for review by PennDOT Bureau of Rail Freight, Ports, and Waterways staff.

The Rail Benefits Estimator (RBE) relies on information provided by program applicants to calculate public benefits and economic impacts of freight rail investments by the Commonwealth. The model was designed to take advantage of as much information as possible from the existing version of the RFAP and TAP grant applications. However, to develop more precise data on transportation benefits, PennDOT is revising the grant applications to request additional data from applicants.

Process Flow

1. Applicant completes and submits the application.

2. PennDOT Bureau of Freight Rail Staff extract information from the application and feed it into the model.

3.2 MODEL ARCHITECTURE AND LAUNCH

The RBE model runs in Microsoft Excel 2007. To launch the model, the user should open the file in Excel and then enable macros by clicking on the "Options" button of the "Security Warning" bar at the top of the spreadsheet (shown below).

Table 3.1   Enable Macros Process

Step	Diagram
Click on "Options" under "Security Warning" at top of spreadsheet.	
Click "Enable this content" and "OK" under the "Security Alert – Macros and ActiveX" box.	
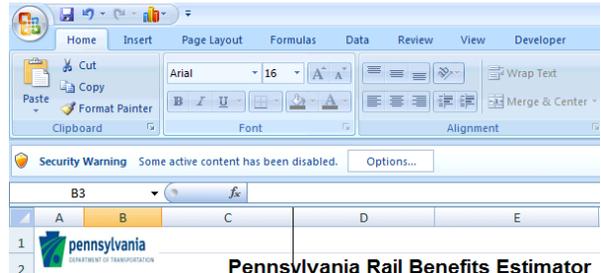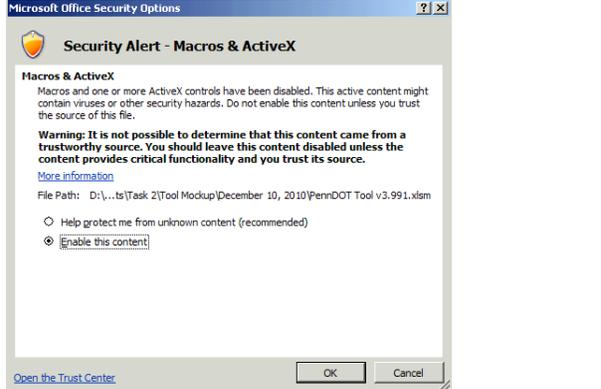
Once macros are enabled, the user may input information from the grant application into the spreadsheet, review results, update the model, and perform other functions. The model is organized into several worksheets. The following chart summarizes the purpose and function of each worksheet.

Table 3.2   Model Organization

Worksheet	Function
Projects Overview	Lists all projects under evaluation, including project name, applicant, affected railroad, construction cost, benefit/cost ratio (with and without construction), and the qualitative score.
Input Screen 1 – Quantitative	Primary data entry screen for project technical and performance data. Includes entries for construction costs, anticipated job creation, and projected future rail car loadings associated with the project.
Input Screen 2 – Qualitative	This screen allows PennDOT to input qualitative scores across a range of criteria. The scores are based on PennDOT evaluation of information in the grant applications and the presentations provided by applicants.
Results	The results worksheet provides detailed results of all qualitative benefits expressed in current year dollars, including total economic output; job creation for the construction and long-term periods; and benefit/cost ratios for public and private investments.
Print Report	This worksheet is formatted to print results for individual projects for PennDOT review and files. Only projects for which data has been entered will be displayed.
Default Parameters	Periodically, PennDOT may update the default parameters that are used in the benefits estimation.
IMPLAN Impacts	This worksheet contains the Pennsylvania state multipliers used in the employment calculations. In the future, PennDOT may update this portion of the model to include county-level detail or updated state-level detail.
Regions Map	This map shows the geographic zones extracted from the PennDOT Statewide Travel Demand Model (Truck Model) from which the RBE model estimates trip distances using data from the applications. This sheet is for reference only.

The following paragraphs provide itemized instructions to guide the use of the model, including information input, development of outputs, and updating of factors.

3.3   ENTER PROJECT QUANTITATIVE INFORMATION

To input the information, the user should follow these steps:

1. **Select Project to Edit.** Go to "Projects Overview" worksheet, select any cell on the row of the desired project (to edit or to enter for the first time), and click "Edit Project" button which will take the user to the worksheet INPUT SCREEN 1 – QUANTITATIVE INPUTS. Alternatively, the user may directly access INPUT SCREEN 1 and select the desired project (to edit an existing project or add a new project) from the "Project Number" dropdown menu.

Figure 3.1   Projects Overview Worksheet

2. **Enter General Project Information.** On INPUT SCREEN 1 – QUANTITATIVE INPUTS, the user should enter the project name, applicant name, and affected railroad as they appear on the grant application. In addition, the user should use the dropdown menu to indicate the applicant type from the following five choices: 1) Railroad Owner; 2) Railroad Lessee/ Operator; 3) Municipality/Government; 4) Railroad User/Business; and 5) Other. Finally, the user should type "Yes" if the project is a maintenance project. A maintenance project is a grant application that requests Commonwealth assistance in improving or rehabilitating rail infrastructure to working condition. PennDOT must decide on an appropriate "discount factor" to be applied to maintained traffic. The default discount factor in the model is 100 percent. This means that maintained traffic is calculated to have the same benefits as new traffic. To change this factor, simply input a new value in cell F3 in the "default parameters" worksheet. Reducing the discount factor to 60 percent will caused the model to value the benefits of maintained traffic to be 60 percent of the value of new traffic. Selecting a discount factor of 30 percent will cause the model to value the benefits of maintained traffic at 30 percent of the value of new traffic, etc.

3. **Enter Construction/Rehabilitation Information.** In this section of INPUT SCREEN 1, the user should enter the total cost of the project (private and proposed public share), the percentage match by the Commonwealth (PennDOT Share of Cost), Project Start Date, and Project Completion Time. In addition, the model user should indicate whether the project is part of a multiphase project and the cost of the phase.

Figure 3.2   Input Screen 1 – Quantitative Inputs

4. **Enter Job Creation Information.** In the third section of INPUT SCREEN 1, the user should use information from the application to enter in the number of full-time jobs directly created by the investment. If the project is a maintenance project the jobs should be entered in the "jobs maintained" column, otherwise the jobs should be categorized as "new" and entered in the "new jobs created" column.   The jobs are divided into five categories: 1) Railroad; 2) Mining/Energy;   3) Distribution/Warehousing;   4) Industrial/ Manufacturing; and 5) General Labor.   The model automatically sums the total number of jobs and average wages which are preset values based on U.S. Bureau of Labor Statistics averages for Pennsylvania for 2010.

Figure 3.3   Input Screen 1 – Truck to Rail Diversion Information

Truck to Rail Diversion Information

#1 OD Pair Affected by this Project

		Avg. Distance	% of Traffic that is New
Origin	PA-Beaver		
Destination	PA-Monroe	347	50%

Unit	Year 1	Year 2	Year 3	Year 4	Year 5
Intermodal Units	13,794	20,671	25,864	27,000	29,000
Carload - Boxcars	0	0	0	0	0
Carload - All Other	0	0	0	0	0

Carloading Data - Number of Cars Handled

Historical Traffic		Projected Traffic	
2008	1,000	2011	4,000
2009	2,000	2012	5,000
2010	3,000	2013	6,000
Total	6,000	Total	15,000

5. **Enter Truck to Rail Diversion Information.** The model relies on truck to rail diversion estimates to calculate several transportation benefits – including highway maintenance, emissions, and safety. To develop these estimates, the RBE requires the user to enter as much information as possible from the application about the effect of the project on car loadings, including "Historical Traffic" which is preexisting traffic; and "Projected" traffic which is future traffic directly attributable to the project. In the "truck to Rail Diversion Information" section of INPUT SCREEN 1, the user may enter the number of units expected for the top (up to three) origin-destination pairs. The user should indicate the number of units by three major classes: 1) Intermodal; 2) Carload-Boxcar; and 3) Carload-All Other for five years following project completion. The user should use the Origin-Destination drop-down menu to select preset geographic zones based on the PennDOT Statewide Truck Model. The zone geography is more granular (county-level) within Pennsylvania and becomes more aggregated with distance from Pennsylvania. Once entered, the model uses the data to calculate the number of miles traffic is diverted from Pennsylvania highways. Next, the user should enter the "percent of traffic that is new" in the cell to the right of the cell that displays the average distance calculated by the model. Finally, at the bottom of the INPUT SCREEN 1, the user should enter historic and projected total values.

6. **Save, Discard, Reset Values.** Once data entry on INPUT SCREEN 1 is complete, the user should click "Save and go to Screen 2" button. If the user wishes to restore values to the previously saved ones, they should click "Discard Changes." To restore default values (e.g., blank inputs and Average Total Wages), click "Reset Values."

3.4 ENTER PROJECT QUANTITATIVE INFORMATION

At any time during the data entry process, the user can enter qualitative scores using INPUT SCREEN 2 – QUALITATIVE. Users can access this screen following data entry on INPUT SCREEN 1 by clicking "Save and go to Screen 2."

The qualitative scoring sheet was developed in cooperation with PennDOT to reflect program and departmental goals. The qualitative categories include: Infrastructure, Coordination, Economic, Environmental Sustainability, Safety and Security, Financial and Institutional, Benefits of Truck Reduction, Types of Benefits, and Track Condition. Each category contains several qualitative measures to help PennDOT ascertain the project value. PennDOT will assign a numeric score, usually from -10 to 15, to rate the degree to which the project fulfills the qualitative measure. For example, if the project fully removes a rail corridor chokepoint, it would receive 15 points (the maximum). A project that scores very low would receive a -10 score for any given measure. The qualitative scoring sheet automatically sums the scores to provide a composite qualitative score.

The scores to each of the criteria are developed by PennDOT based on the information provided in the grant applications and through the interviews held during each funding round for RFAP and/or TAP. The following graphic provides a snapshot of the scoring sheet content.

1. **Enter Qualitative Scores.** To enter the information, the user should check the "General Project Information" at the top of the sheet and then enter the scores developed by PennDOT to rank the project for each measure. Once finished, the user should click "Save" which will advance to the "Overview" screen. The user also can click "Back to Input Screen 1" to view/edit quantitative information.

Figure 3.4   Input Screen 2 – Qualitative Scoring Sheet

pennsylvania
DEPARTMENT OF TRANSPORTATION

Pennsylvania Rail Benefits Estimator

General Project Information

Project Number	1
Project Name	Project 1
Applicant Name	Person 1
Affected Railroad	Railroad 1

Save (back to Overview)

Back to Input Screen 1

Qualitative Input

Code	Potential Qualitative Criteria	Current	Max	Min	Potential Measures: *To what degree would the project…*
A. Infrastructure		Current	Max	Min	Notes
A.1	Increase service	10	15	-10	Enhance connectivity, reach new markets
A.2	Physical Condition	2	15	-10	Improve track or rail conditions
A.3	Physical capacity	3	15	-10	Increase physical capacity
A.4	Operational capacity	4	15	-10	Improve operational capacity
A.5	Chokepoints	5	15	-10	Remove a corridor chokepoint
B. Coordination		Current	Max	Min	Notes
B.1	State planning documents	1	15	-10	Match state rail planning vision, goals, objectives
B.2	Multi-state initiatives	2	15	-10	Support MAROps or other multi-state initiatives
B.3	District Offices and MPO/RPO responses combined	10	15	-10	Match MPO/RPO vision, goals, and objectivees
C. Economic		Current	Max	Min	Notes
C.1	Job Retention	10	15	-10	Maintain existing jobs
C.2	State/regional/local competitiveness	0	15	-10	Improve business attraction/retention
C.3	Increase economic viability	3	15	-10	Enhance connectivity or capacity
C.4	Modal competitiveness	4	15	-10	Provide cost-effective rates and alternatives
C.5	PA Development Area	5	15	-10	Strengthen communities across the Commonwealth
D. Environmental Sustainability		Current	Max	Min	Notes
D.1	Energy Use	1	15	-10	Reduce net energy consumption
D.2	Climate Change	2	15	-10	Reduce net greenhouse gas emissions
D.3	Smart Growth	3	15	-10	Catalyze redevelopment
E. Safety and Security		Current	Max	Min	
E.1	HazMat	4	15	-10	Provides safer transport of hazardous materials
E.2	STRACNET	5	15	-10	Is it on the STRACNET?
E.3	Network Connectivity	1	15	-10	Provide redundancy in the network
F. Financial & Institutional		Current	Max	Min	Notes
F.1	Financial Need	2	15	-10	Require state assistance
F.2	Working Relationship with PennDOT	3	15	-10	Have a good working relationship with PennDOT
F.3	Implementation	4	15	-10	Have the ability to build and utilize the project
G. Benefits of Truck Reduction		Current	Max	Min	Notes
G.1	Trucks Removed		3,000		Avg Annual Number of trucks removed from road
G.2	Points for Truck Removal	25	40	0	Score for truck removal
H. Types of Project Benefits		Current	Max	Min	Notes
H.1	Re-establish Rail Service	0	20	0	Only enter data in one of these 4 metrics
H.2	New Rail Service	0	15	0	Only the highest value will be counted towards the total
H.3	Expand Rail Service	0	10	0	
H.4	Other-Maintenance, etc	0	5	0	
I. Track Condition		Current	Max	Min	Notes
I.1	New Track	0	10	0	Only enter data in one of these 4 metrics
I.2	Poor	0	9	0	Only the highest value will be counted towards the total
I.3	Average	0	6	0	
I.4	Good	0	2	0	
TOTAL SCORE		Current	Max		
		109	400		

3.5   RUN AND VIEW RESULTS

1. **View Results.** To view the detailed results of the model, the user should click on "Results" in the PROJECT OVERVIEW worksheet which will advance the user to the RESULTS worksheet. The results are organized into the following categories and subcategories:

   a. **Operational Impacts.**   These are long-term impacts of the project expressed for the five-year post-construction period required by Pennsylvania statute.

      i. **Jobs.** The impacts include two types of employment effects, both expressed in average annual job years. First, **Direct Annual Average Jobs** (those created by the investment and listed by the applicant) and second: **Total Annual Average Jobs** (the direct jobs plus additional jobs created in the broader economy that are supported by the spending of the "direct jobs" such as induced and indirect jobs).

      ii. **Transportation Impacts.** These impacts related to the diversion of truckloads from Pennsylvania highways resulting from the rail investment. This first-generation model does not calculate the effects of rail network effects but uses the origin-destination data provided by the applicants to calculate total truck vehicle miles **removed** from Pennsylvania highways using information from PennDOT's State Travel Demand Model.[2] The outputs of the transportation impacts are expressed in current year (2010) dollar savings to **Highway Maintenance** (reduction in truck wear and tear on highway infrastructure); **Safety** (reduction in truck crash rates and associated marginal costs of crashes); **CO_2 Lbs.** (monetized values of carbon savings between truck and rail miles[3]); **Air Quality Impacts** (monetized savings from reduction in other emissions such as NO_X and PM_{10}); **Diesel Tax Reduction** (the loss of revenue from diesel tax from the per-mile savings accruing to rail instead of truck); and **Shipper Savings** (the savings to shippers resulting from lower rates on rail versus truck).

      iii. **Net Impacts.** The net benefit of the operational impact includes all jobs and transportation impacts except the monetized value of carbon.

   b. **Construction Impacts.** These impacts result from short-term employment during the construction period and include direct construction jobs

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[2] The distances within counties are calculated by Cube using shortest path method to get the shortest network distance between two points (centroids). The distance within counties will be the average distance from centroids to county border along the shortest path.

[3] Carbon is included for reference only and is not part of the net benefits calculation.

and total average annual jobs (indirect, induced, and direct). Construction impacts are not part of traditional benefit/cost analysis but instead provide an idea of the immediate economic stimulus provided by the investment.

c. **Combined Impacts.** The combined impacts summarize the results of the operational and construction impacts and include **Average Annual Jobs** (total direct, induced, indirect from operational impacts and construction); **Monetary Benefits** (net result of all monetized impacts and benefits); **Total Construction Cost; Phase Cost; Discounted Costs** (Total Construction Cost discounted to net present value over the five-year post-construction period); **ROI w/Const (**Return on investment, including the construction impacts); and **ROI wo/Const** (Return on investment excluding construction costs). The latter two ROI scores are the first of several benefit/cost ratios provided by the model.

d. **Impacts for PA Investment.** These cells provide a specific set of benefit/cost ratios to demonstrate the return on investment of Commonwealth (public) dollars in the project. This results category includes **PA Disc. Costs** (portion of Commonwealth participation in the investment expressed in current year net present value); **PA ROI 1** (shows total ROI or benefit/cost ratio, including private benefits from shipper savings); and **PA ROI 2** (excludes private shipper savings and construction impacts).

e. **Additional Information.** This section provides the **Total Qualitative Score** and indicates whether the project is a **Maintenance Project**. Because this model treats maintenance and new capital investments the same way (e.g., preserved jobs and preserved rail traffic are treated the same as new jobs and new rail traffic), the model will estimate higher benefit/cost ratios for maintenance projects. This column allows PennDOT to take that information into consideration.

2. **Print Report.** The results of the analysis are provided in an easier-to-read and print format that contains the same information provided in the RESULTS tab. To access the formatted report to print, the user can click the "Reports" button in the PROJECT OVERVIEW worksheet or go directly to the PRINT REPORT worksheet. The report is formatted to print on 8½" x 11" paper. Note that only projects for which data is entered will be shown. The report filters out projects with no cost information.

3.6 MODEL MAINTENANCE

The model is preset to 2010 for most factors used in the benefits estimates calculations. Periodically, PennDOT should update the factors to current year standards; in particular, each year the "Current Year" in the model should be updated so that costs and benefits are discounted properly. Factors for most

calculations (including current year) are contained in the worksheet DEFAULT PARAMETERS. Within that spreadsheet, the current factors are listed along with relevant source information for items that should be updated periodically at the discretion of PennDOT. The current factors were developed in consultation with PennDOT and the Study Advisory Committee during the course of 2010. The DEFAULT PARAMETERS screen also contains a button at the bottom to allow the user to adjust the number of total projects in the model (default is 25).

Another worksheet IMPLAN IMPACTS shows how the model calculates direct, indirect, and induced jobs per $1 million investment expenditure. These multipliers were developed using the 2006 statewide IMPLAN model for Pennsylvania purchased for the I-95 Corridor Coalition's Mid-Atlantic Rail Operations Study Phase II. The IMPLAN model currently resides on Cambridge Systematics network but the license does not limit its use to the I-95 Corridor Coalition projects. The IMPLAN IMPACTS worksheet also shows the distribution of construction industry expenditure estimated by Cambridge Systematics from observations of past projects. In the future, PennDOT may update this portion of the model by purchasing the county-level economic model from IMPLAN and amending the model accordingly to show county-level economic results.

A. Appendix

A.1 Applicant Interview Script

The following script was used to guide interviews with Pennsylvania freight rail grant applicants.

Introduction

Good _____, and thank you for talking with me today. PennDOT is developing a freight rail investment tool to help prioritize funding for rail projects. As part of the initial stage of this study, we are collecting input from several regional and short line carriers to help us design a tool that meets the needs of the Commonwealth and its rail carriers. We will use the information collected in this interview to determine, among other things, what kind of data rail carriers like yours could provide as part of a project funding application.

Questions

1. Has your railroad applied for Pennsylvania railroad funding in the past? If so, what program(s) have you applied for funding through?

    a. Were these projects successfully approved by the State? Why or why not?

2. What types of projects is your railroad most interested in receiving funding for?

3. How familiar is your railroad with the evaluation process of railroad funding programs in Pennsylvania?

    a. What are the strengths of the current evaluation process?

    b. What opportunities for improvement are there in the evaluation process?

4. Consider the various factors that the State uses to evaluate competing projects for rail funding.

    a. What factors do you think are the most pertinent?

    b. Are there any factors that are not included in the evaluation that you think should be included?

    c. Are there any factors that you think should not be considered in the evaluation process?

5. Does your railroad have the data requested by the State when submitting applications for rail funding?

6. What are the strengths and weaknesses of the application submittal process?

     a. Do you develop these data internally or do you rely on outside engineers or consultants?

     b. To better understand the benefits of potential truck to rail diversion, information about the "Pennsylvania distance hauled" would be helpful. What are your thoughts related to providing this information in the application?

     c. Does your railroad regularly collect performance metrics of projects? What kinds of performance metrics do you collect?

7. What challenges, if any, has your railroad faced in implementing projects after they have been approved?

8. What other advice would you offer the State as it develops this new system?

A.2   Interview Summaries

Table A.1   Interview Summary

Interview Questions	Stakeholder #1	Stakeholder #2	Stakeholder #3	Stakeholder #4	Stakeholder #5	Stakeholder #6
Has your railroad/ organization applied for Pennsylvania railroad funding in the past?	Yes.	Yes.	Yes.	Yes.	Yes.	Yes.
If so, what program(s) have you applied for funding through?	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.	RFAP.	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.
Were these projects successfully approved by the State?	Mixed – some approved, some not.	Yes.	Most were but we were denied in the last round.	About 40 percent were funded.	50-50.	All projects have been funded, but some only partially.
Why or why not?	When projects are not approved, we think it's because there are many requests but only a limited pool of funds.	One year, we didn't make the first round, but whoever won first didn't have the match so received the funds on a second run.	We heard that it was due to lack of funding and that other projects (for bridge and tunnel work) took priority.	The projects that weren't funded didn't score high enough according to the criteria used by PennDOT.	The projects that were not approved were denied because there isn't enough money to go around.	
What types of projects is your railroad/organization most interested in receiving funding for?	Fixing up deferred maintenance (ties and rail) and adding new customers (sidings and spurs).	Rehabilitating abandoned spurs – adding spurs and sidings.	Mostly maintenance (ties and rail) – occasionally for new spurs and sidings.	Maintenance projects to attain Class II standard (25 mph) on one of our tracks – also need funds for a tie job to get to 30 mph on another section of track – and a capital project to install a full rail train (seven track miles) of welded rail – and other projects to add spurs or sidings to connect new customers.	Tie replacement and rail upgrades to be able to increase speeds. Much of the track can only handle 10 mph (one section only 5 mph) and some customers are at the end of 35 miles of track.	Track extensions to new customers – reactivation of formerly inactive rail lines and yards – increase load capacity and overall capacity.

Interview Questions	Stakeholder #1	Stakeholder #2	Stakeholder #3	Stakeholder #4	Stakeholder #5	Stakeholder #6
What are the strengths of the State's current evaluation process?	Just the fact that the State is willing to help.	Being able to make presentations in Harrisburg is a strength as are the site visits.	Being able to make presentations in Harrisburg – also requiring just a 30 percent match is great.	Being able to make presentations in Harrisburg is a strength as are the site visits.	They do a good job of spreading the funding around.	Not familiar with the State's process.
What opportunities for improvement are there in the current evaluation process?		Being able to see inside the scoring system used to award funding.	None.	More site visits.		Not familiar with the State's process.
What factors do you think are the most important?	The most important factor is for the railroad to prove the need for the project.	Job retention/creation – history of how the applicant delivered on previous projects – carloads.	Economic development (job creation and private investment).	Jobs created and getting trucks off the road – also should review how the project benefits the rail network overall.	Jobs created and getting trucks off the road.	Jobs created and the extent to which the project improves the overall network.
Are there any factors that are not included in the evaluation that you think should be?	No.	The applicant's success on previous projects.	No.	No.	No.	No.
Are there any factors that you think should not be included in the evaluation process?	No.	Don't know.	All of the factors are relevant, however, we don't know what our customers are shipping over our line (NS handles that) and we aren't sure why that information is required.	No.	No.	No.
Does your railroad/ organization have the data requested by the State when submitting applications for rail funding?	Yes.	Yes.	Yes – except for the specific types of freight moved.	Yes.	Yes.	Yes.

Interview Questions	Stakeholder #1	Stakeholder #2	Stakeholder #3	Stakeholder #4	Stakeholder #5	Stakeholder #6
How does the State currently collect data from your railroad/organization when applying for funds? How well does the current application submittal process work?	The application submittal process works well.	The application submittal process works well – but it would be good to be able to print the application.	The application submittal process is straightforward, but it could be more open-ended. Would like to be able to more easily navigate between the pages when filling out the application.	The on-line application only allows you to see one page at a time. It should allow you to see the entire application, i.e., it should scroll from page to page without signing in and out of each one.	The application submittal process works well.	The application is pretty simple.
Do you develop these data internally or do you rely on outside engineers or consultants?	We do it all in house.	Both – we work with an engineer to develop the scope of work and the drawings.	We use an engineering consultant for inspections and design work.	We do it all internally.	We do it all internally.	We do it all internally.
To better understand the benefits of potential truck to rail diversion, information about the "Pennsylvania haul distance" would be helpful. What are your thoughts related to providing this information in the application?	Any railroad can pull the waybill – just have to put the time into it.	This would be a little cumbersome – there are so many origins (rail is primarily inbound – trucks distribute regionally) maybe OK if we can just provide the largest two origins.	This would be difficult for us to come up with plus it might be proprietary.	This would be difficult and take a long time to do. We know how far cars move on out network, but once they switch to the Class Is, we don't know where they go or by what route.	Some moves are easy to calculate (coal from a mine to a power station for example) but other moves we don't know – we know how far we move the cars but don't know how the Class I's route them.	This information should be relatively easy to provide.
Does your railroad/ organization regularly collect performance metrics of projects? What kind of performance metrics do you collect?	Monthly reports with carloading.	Carloads.	Carloads plus a running tally of jobs.	Carloads.	No.	Carloads.

Interview Questions	Stakeholder #7	Stakeholder #8	Stakeholder #9	Stakeholder #10	Stakeholder #11
Has your railroad/organization applied for Pennsylvania railroad funding in the past?	Yes.	Yes.	Yes.	Yes.	Yes.
If so, what program(s) have you applied for funding through?	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.	Both the RFAP and the Capital Budget programs.
Were these projects successfully approved by the State?	Most applications were approved for funding.	Sixty to 70 percent successful.	We have been quite successful.	Our success rate is mixed – we are reasonably successful.	We have a high success rate.
Why or why not?		For those that were not approved there are two reasons – 1) too much demand and not enough funding overall, and 2) our projects are mostly basic maintenance which are not flashy.		When our projects are denied, we generally don't know why.	
What types of projects is your railroad/organization most interested in receiving funding for?	Ties, rail, surfacing, etc. Also to upgrade main line to 286,000-pound capacity.	Capital tie and surface improvements – major tie replacement and upgrade program. Also looking bridge improvements and rail replacement. We try to leave applications for new sidings or spur rehabs to the customers.	Major yard upgrade (multiphase capital project).	For RFAP projects, we look for tie and rail replacement (mostly ties) – For capital projects, we look for bridge and tunnel upgrades.	We are past the point of needing ties and are now looking for main line improvements, including bridge work, rail replacement, and side tracks.
What are the strengths of the State's current evaluation process?	Key strength is that the Bureau of Rail Freight is efficient – another strength is the focus on carloads and jobs which enables an apples to apples comparison among projects.	They have a good plan based on jobs and taking trucks off the highway.	The process requires that you really know what you are doing and that you have a good factual story – also the focus on getting trucks off the highway is good.	Having separate funding pools for maintenance and capital projects.	The process is fair and the focus on economic benefits is also a strength.

Interview Questions	Stakeholder #7	Stakeholder #8	Stakeholder #9	Stakeholder #10	Stakeholder #11
What opportunities for improvement are there in the current evaluation process?	The greatest improvement is to find a way to increase overall funding of the program.	There should be a way to distribute money to more projects and more areas of the State.	None.	It would be good to have a better idea of how the evaluation process works – also could provide guidance and just what is a good RFAP project and what is a good capital project – also should provide more funding in the RFAP pool.	It seems that the application could be a little shorter and that the process could be streamlined somewhat.
What factors do you think are the most important?	Carloads and jobs – these factors are tangible and objective – it is very important to use these two factors to compare projects. The other factors (trucks off the highway, etc.) are good but it's important to focus on the carloads and jobs.	Carloads (even more than jobs because the job numbers can be fudged) – if jobs are used the State should review the numbers carefully and make sure all jobs numbers are derived from a uniform procedure.	Safety, jobs, and trucks off the highway.	Jobs created and getting trucks off the road – also seem to be looking for bridge projects.	Carloads and jobs. The focus on economic impacts is the biggest strength but also can be a flaw. If a project benefits a small customer handling 300 cars, it might not make the cut compared to another project benefitting a larger customer. This is unfair to the little guys.
Are there any factors that are not included in the evaluation that you think should be?	No.	No.	Should have some kind of financial evaluation to determine if they have enough capital to do the project.	No.	Should include a factor that considers the economic impact to small customers.
Are there any factors that you think should not be included in the evaluation process?	Can't think of any.	No.	No.	No.	No.
Does your railroad/ organization have the data requested by the State when submitting applications for rail funding?	Yes.	Yes.	Yes.	Yes.	Our organization provides turnkey support to our customers – we scope the project, develop the budget, assist with the application, put the bid packets together, and make the presentation.

Interview Questions	Stakeholder #7	Stakeholder #8	Stakeholder #9	Stakeholder #10	Stakeholder #11
How does the State currently collect data from your railroad/ organization when applying for funds? How well does the current application submittal process work?		The application submittal process works well – they provide help if you have trouble. However, the application window should be open longer.		By and large the application submittal process works well.	The application submittal process could be improved if the passwords didn't expire so quickly.
Do you develop these data internally or do you rely on outside engineers or consultants?	We do it internally.	Internally – except when we help customers with their applications we have to rely on them for their data but we develop all the project details and costs in house.	We supply most information internally but work hand-in-hand with an engineering firm to put together plans for the projects.	We do it all internally.	We do it all internally.
To better understand the benefits of potential truck to rail diversion, information about the "Pennsylvania haul distance" would be helpful. What are your thoughts related to providing this information in the application?	It would be OK to ask this as long as the information requested is not proprietary – asking about general origin-destination information should be OK but should not break down into the finite areas of shippers, consignees, or consignors.	Providing origin-destination information should not be a problem – and it's valid for the State to ask but the information should be kept confidential. Also, we would have to rely on customers to provide the data which would add time to the process.	This would be difficult for us to come up with – as a switching carrier we are not privy to the waybill on the load, but if it was required we would find some way to provide an estimate.	We could do this but we have to rely on customers for this information – not sure if the customer could give a good number – we could give a good guess at the number of trucks but not the mileage.	We don't track this information so it would be difficult to provide it.
Does your railroad/ organization regularly collect performance metrics of projects? What kind of performance metrics do you collect?	Carloads, completion time, etc.	Carloads.	Carloads and project delivery measures.	Carloads.	Frequent construction inspections – including penalties for contractors for construction delays – incorporating performance bonds as insurance for contractors who can't complete the work – so it can be repaired and/or finished.
What challenges, if any, has your railroad/organization faced in implementing projects after they have been approved?	No specific problems.	No problems.	Staying within the cost guidelines is a challenge – especially with rising engineering and materials costs.	No problems.	No problems.
What other advice would you offer the State as it develops this new tool?	None except that the State should be sure to use objective standards such as carloads and jobs in their evaluation of projects.		They are doing a great job – we are glad to have a program like this in Pennsylvania.	We operate in Pennsylvania and Ohio – Ohio should look to emulate Pennsylvania – they do a good job funding rail projects.	Make the application less cumbersome.