

2.9.5.2 Toll Route 66 and PA Route 136

This station, at the eastern project terminus, would be located adjacent to the Toll 66/PA Route 136 interchange west of PA Route 136 in Hempfield Township and encompass 6.0 hectares (15 acres). Roadway infrastructure improvements at this location would include several turning lane additions and signalization improvements.

2.10 Cost Estimates and Financing

2.10.1 Capital Costs

Capital cost estimates for the Environmentally Preferred Build Alternative were prepared by MAGLEV, Inc., and are based on engineering plans, profiles, and other engineering details and the use of the *PENNDOT Bulletin 50-Construction Cost Catalog* and other information for unit construction cost estimates. Cost information supplied by Transrapid International was used in the development of the maglev system cost elements.

As shown in Table 2.10.1-1, the project has an estimated total project cost of approximately \$3.725 billion in Year 2003 (\$3.357 billion base cost plus contingency). Cost items and approaches used in this estimate include the use of design-build contracts, hollow core and precast/post tension substructures in some applications, and precision fabrication technology for the manufacturing of steel guideway beams.

Table 2.10.1-1 Capital Cost by Category

Cost Estimate Category	2003 Capital Cost with Contingency (\$ millions)	% of Total
Stations, Roads, and O&M Facility	\$482	13%
Substructure	\$792	21%
Superstructure	\$890	24%
Guideway Switches	\$65	2%
Guideway Equipment	\$311	8%
Special Structures	\$181	5%
Earthwork & Mobilization	\$225	6%
ROW, Environmental, and Utility Relocations	\$263	7%
Vehicles	\$209	6%
Project and Construction Management	\$123	3%
Engineering	\$184	5%
Total Capital Costs	\$3,725	100%

SOURCE: MAGLEV, Inc.

The cost estimate includes up to 30 percent contingency on various capital cost items totaling \$368 million. System-related cost items supplied by Transrapid International include contingency in their unit cost estimates.

Details of the project cost estimate methodology and development are included in the PTSF.

A description of what is included in the various elements of the cost estimate is as follows:

Station, Roads, and Operating and Maintenance (O&M) Facility – This category includes: construction of five maglev stations, parking facilities, roadway improvements, and the O&M facility.

Substructure – Includes foundations, pier structures, crash walls, geotechnical, and mine subsidence/stabilization costs.

Superstructure – Consists of Type I and Type II guideway, secondary structures, and the cost of the precision fabrication plant.

Guideway Switches - Guideway switching equipment.

Guideway Equipment – Consists of the control/communications, energy supply, and propulsion systems.

Special Structures – This category includes side road improvements, earth retention systems, the structure crossing the Monongahela River, and box culverts.

Earthwork and Mobilization – Consists of clearing and grubbing, excavation, off-site hauling and disposal, and site restoration. A 4.0 percent mobilization cost was applied to guideway, substructures, and local roadway improvements. Mobilization was not applied to items supplied by Transrapid International, maglev stations, the O&M facility, and station circulation roadways as these items have a 7.5 percent general condition cost included.

ROW, Environmental, and Utility Relocation – ROW costs are based on a smaller footprint than the EIS impact zone. Cost estimates use a right-of-way of either 15.2 meters (50 feet), or 7.6 meters (25 feet) from each side of the alignment centerline, or the top of the cut slope plus 6.1 meters (20 feet). Environmental costs include mitigation commitments for noise, wetlands, and other environmental impacts. Utility costs include aerial and underground utility relocation costs.

Vehicles – Includes vehicles from Transrapid International and commissioning costs.

Project Management (PM) and Construction Management (CM) - PM/CM costs are based on a specific staffing organization and manpower estimate to support both pre-construction (design) and construction phases of the project. Annual costs of each component were calculated then the appropriate period applied to determine estimated project PM/CM cost.

Engineering – Engineering costs are based on a specific staffing organization and manpower estimate to support both pre-construction (design) and construction phases of the project. As a total, these costs represent approximately 5.0 percent of the total station and maglev system infrastructure costs.

The year of expenditure (YOE) project cost including financing costs, shown in Table 2.10.1-2, is estimated to be approximately \$4.573 billion. This includes \$4.116 billion construc-

tion-related costs with escalation costs (approximately \$391 million) based on a seven-year construction schedule. The YOE project cost of approximately \$4.573 billion also includes financing costs, interest, and debt service reserve.

Table 2.10.1-2 Year of Expenditure Project Cost

Item Description	Cost (\$000)
2003 Capital Cost	\$3,725,341
Escalation	\$390,948
Finance Related Costs	\$456,392
Total YOE Cost	\$4,572,681

SOURCE: MAGLEV, Inc.

As a high-speed maglev project has not been implemented in this country, a consulting group retained by the public sponsors has conducted an independent cost/risk assessment study. In YOE dollars the independent study results, based on MAGLEV Inc.'s target seven-year construction schedule, including contingencies and using conventional construction techniques, were within 10.0 percent of the presented project cost. These differences were determined to be reasonable at this level of development and at this point in the environmental process. YOE costs will vary depending on when funding is achieved and when the project begins and is completed; a longer schedule will increase escalation.

A more detailed description of the evaluation process and results of the study can be found in *The Pennsylvania High-speed Maglev Project, Independent Cost Estimate and Risk Assessment/Management, December 2004*; and, *Risk-Based Evaluation for Proposed Maglev Project, July 30, 2004*.

2.10.2 Operating and Maintenance Costs

The basis for estimating O&M costs includes input from the technology supplier, Transrapid International, and staffing plans developed by MAGLEV, Inc. O&M costs include maintenance of right-of-way, maintenance of vehicles, equipment and all guideway-related infrastructure, labor for transportation passenger traffic and freight services, energy and utility supply, insurance, and general administration expenses.

Table 2.10.2-1 Operating and Maintenance Costs

Cost Category	Number of Jobs	O&M Cost (\$ millions/yr)
Stations and System Labor	141	\$7.19
Maintenance and Control Center Labor	55	\$4.02
Administration Labor	18	\$2.23
Administrative Expense	N/A	\$1.79
Energy Costs	N/A	\$7.85
Maintenance Material	N/A	\$7.70
Miscellaneous	N/A	\$2.55
Contingency	N/A	\$4.00
Total	214	\$37.33

SOURCE: Maglev, Inc.

Operating and maintenance expenses have been developed for the phased implementation and commissioning of the three operating sections that comprise the project. Table 2.10.2-1 summarizes the annual O&M costs.

A replacement reserve fund will be created from the surplus revenues generated by the project after O&M costs and debt service payments. This reserve will begin after the full project is in revenue service. These reserve funds are to support vehicle replacements and major

infrastructure reinvestment capital after 20 years of service.

The total number of jobs planned for the system is 214. Total operating labor, including personnel at each station, will consist of 141 jobs. This includes 21 vehicle attendants and the associated station manager jobs. The remaining positions will provide passenger and freight service for the system. Approximately 55 jobs will be the maintenance and control center labor force needed to support the operation. A total of 18 administrative jobs are planned.

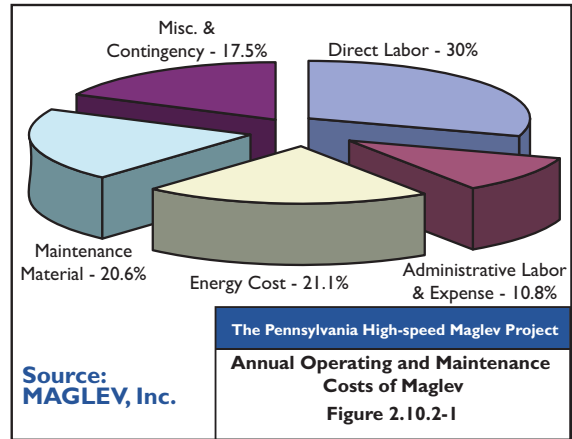


Figure 2.10.2-1 provides a percentage breakdown of the annual operating and maintenance costs for the entire 87-kilometer (54-mile) project.

2.10.3 Financial Plan

A preliminary financial plan was prepared by MAGLEV, Inc. that funds the development, design, construction, equipment, and operation of the project. The results of a future independent Financial Feasibility Study will be used to refine this financial plan following the issuance of a ROD from the FRA.

The current financial plan development was completed with the assistance of an investment banking committee established by MAGLEV, Inc. This committee consists of Citigroup Global Markets Inc., Raymond James Associates, and PNC Capital Markets.

The plan is based on the project ridership estimate (see Section 4.12) and a \$5.00 fare between stations. The plan will utilize federal and state match grant funds and reflects the use of *Transportation Infrastructure Finance and Innovation Act* (TIFIA) funds along with revenue bonds. TIFIA is a federal credit assistance program created in 1998 under TEA-21 and the current plan assumes its renewal. The financial plan includes funding for construction, escalation, and finance-related costs. The project finance plan funding sources and uses of funds are shown in Table 2.10.3-1.

Revenues used for project debt financing are based on a \$5.00 fare between stations plus non-fare box revenues of \$40 million in the base year of full operation of the project. Project revenues are discussed elsewhere in Chapter 4.0 of this DEIS (see Passenger Ridership Demand and Revenue Estimation Process and Methods). Federal and state match funds are based on reauthorization of TEA-21 level funding for maglev deployment. This includes the \$950 million federal grant funds and \$475 million state match.

The financing and implementation plan for concurrent construction and operation of the full 87-kilometer (54-mile) project is based on a total capital cost including financing of approximately \$4.573 billion (YOE) for design and construction with a seven-year construction schedule following the issuance of a ROD, with construction to begin in June 2006. In addition to the \$950 million federal grant and the \$475 million state match, this plan utilizes the TIFIA program in combination with first-tier, tax-exempt revenue bonds of approximately \$570 million that would

Table 2.10.3-1 Finance Plan Sources and Uses of Funds

Uses and Sources of Funds	2003 Dollars	Total Cost YOY
Uses of Funds		
Total Construction Costs	\$3,725,341,000	\$4,116,289,000
Financing	--	\$456,392,000
Total Uses of Funds	\$3,725,341,000	\$4,572,681,000
Sources of Funds		
	Percentage	Dollars
Current Interest Revenue Bonds (CIB)	6.80%	\$310,674,000
Capital Appreciation Revenue Bonds (CAB)	5.60%	\$257,034,000
TIFIA	33.10%	\$1,512,235,000
Federal Grant	20.80%	\$950,000,000
State Grant	10.40%	\$475,000,000
A.R.E. Road Funds	2.70%	\$123,648,000
Other Equity Sources	17.40%	\$795,031,000
Interest Earnings	3.30%	\$149,059,000
Total Sources of Funds	100.00%	\$4,572,681

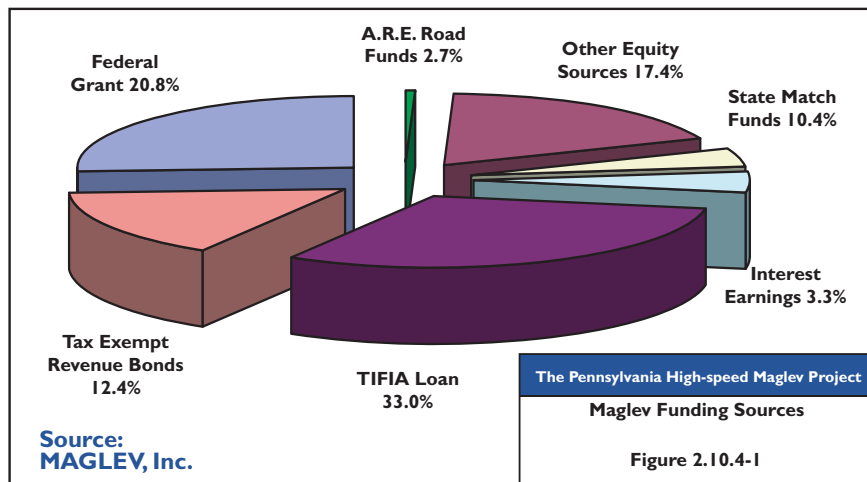
SOURCE: MAGLEV, Inc.

* Funds identified by the local MPO (Southwestern Pennsylvania Commission) and in the Long Range Plan for access roads to maglev stations. A.R.E. stands for "Available Resource Element".

receive the minimum investment grade rating needed for a successful TIFIA application. Bond Anticipation Notes (BANs) are planned to minimize capitalized interest charges in anticipation of the \$1.5 billion TIFIA loan. Other equity resources of approximately \$795 million will be utilized. Senior revenue bond debt is based on a minimum debt coverage ratio of 2.0 as recommended by the investment banking committee, as advised by the rating agencies.

2.10.4 Funding Sources

Figure 2.10.4-1 provides an overview of the funding sources. Table 2.10.3-1 also shows the sources and uses for the project. It includes federal and state match funds totaling \$1.425 billion; approximately \$570 million of revenue bonds; a \$1.5 billion TIFIA loan;



and approximately \$124 million of Available Resource Elements (A.R.E.) funds will be used to pay for road improvements as identified in the Long Range Plan (2030) of the SPC. Approximately \$795 million of other equity funds will be utilized. The other equity source category includes a variety of funding alternatives, including private investment funds, additional revenue bonds, revenues associated with zone fare and station optimization, contractor subordinated debt, tax credit bonds, or additional public grant funds.

Operating Pro Formas

Table 2.10.4-1 highlights operating revenues, costs, debt service, and maintenance reserve fund balances over a 35-year operating period. It is based on the following assumptions:

Table 2.10.4-1 Operating Pro Forma Cash Flow Schedule

Budget Item	2010	2015	2020	2025	2030	2035	2040	2045
Fare Box Revenue	19,731,048	105,314,790	127,561,898	154,518,753	187,184,051	226,768,522	274,739,993	332,878,025
Other Revenue	10,488,581	52,556,304	67,489,269	79,738,515	94,258,394	111,478,680	131,912,108	156,170,693
Total Revenue	30,219,629	157,871,094	195,051,167	234,257,268	281,442,445	338,247,202	406,652,101	489,048,718
O&M Expenses	16,680,000	40,791,499	47,288,527	54,820,364	63,551,826	73,673,984	85,408,340	99,011,674
Operating Cash Flow	13,539,629	117,079,595	147,762,640	179,436,904	217,890,619	264,573,218	321,243,761	390,037,044
Plus: Interest Earnings	-	2,838,541	2,838,541	2,838,541	2,838,541	2,838,541	2,838,541	2,838,541
Senior Debt Service	-	58,539,797	29,667,954	58,462,740	93,420,663	132,286,609	-	195,018,522
TIFIA Debt Service	-	-	104,661,718	104,661,718	104,661,718	108,234,498	292,039,782	-
Net Operating Cash After Debt Service (Transfer to Major Maintenance Reserve)	13,539,629	61,378,339	16,271,509	19,150,987	22,646,779	26,890,652	32,042,520	197,857,063
Balance of Major Maintenance Reserve	13,539,629	291,721,643	418,699,313	580,526,344	289,758,880	309,768,999	450,984,225	871,500,604
Senior Debt Outstanding Par Amount	567,708,210	382,004,505	321,010,196	209,824,609	123,670,552	32,414,855	26,258,061	12,932,445
TIFIA Debt Outstanding	1,543,540,518	1,993,556,537	1,993,556,537	1,993,556,537	1,993,556,537	1,989,983,757	1,132,727,684	-

SOURCE: MAGLEV, Inc.

- Total revenues include ridership and non-fare box revenue;
- Ridership growth rate is based on the regional data provided by the SPC. Ridership growth beyond the SPC LRP year of 2025 (or 2030) is based upon population and employment growth rate in the LRP prior to 2025 or 2030);
- Non-fare box revenue includes naming rights, advertising, freight, extended parking, joint development, and other revenue sources;
- Only the first section from the Airport to Downtown will be in operation by the year 2010 with the remaining sections coming on line in 2011 and 2012, respectively;
- All costs and revenues are inflated at an annual growth rate of 3 percent;
- Based upon customary rating agency requirements, debt service coverage on senior debt (the current interest and capital appreciation revenue bonds) must be a minimum of two times to obtain the investment grade rating requirement for TIFIA credit assistance;
- Maximum TIFIA financing is limited to 33 percent of total project cost;
- TIFIA requires minimum aggregate debt coverage of 1.10;
- Debt service is based on current bond market rates;
- Senior debt interest rates assume an investment grade rating in the “Triple-B” category; and
- The Maintenance Reserve Fund balance is sufficient to fund vehicle replacements and major infrastructure capital improvements starting in year 20 of operation.

The operating pro forma cash flow schedule was developed with the assistance of the project investment banking committee. The finance plan and associated pro formas are based on reasonable assumptions that would result in a financially successful project implementation and a sustainable operating entity into the foreseeable future. In order to ensure that the revenue bonds are marketable and that the *TIFIA* credit assistance is available, it will be necessary to receive one or more investment grade ratings on the revenue bonds.

Following completion of the EIS process and the issuance of a ROD from the FRA, an independent review by investment bankers of the project's construction cost, schedule, projected revenues, and operating costs will be conducted in preparation of the bond ratings for the project.

2.10.5 Management and Ownership Structure

The project will be managed by a non-profit corporation organized pursuant to Internal Revenue Service Revenue Ruling 63-20. The Board of Directors of the corporation will be appointed by the Governor of Pennsylvania.