

## 6. Operating Costs

This chapter describes the various costs associated with operating the Ohio Hub passenger rail system. Operating costs are categorized as variable or fixed. Variable costs change with the volume of activity and are directly dependent on ridership, passenger miles or train miles. For each variable cost, a principal cost driver is identified and used to determine the total cost of that operating variable. An increase or decrease in any of these will drive the operating costs higher or lower. Fixed costs are generally predetermined, but may be influenced by external factors, such as the volume of freight traffic or may include a relatively small component of activity-driven costs. Some fixed costs, such as station operations, increase as line segments open but not in direct proportion to train miles. As a rule, costs identified as fixed should remain stable across a broad range of service intensities.

When analyzing variable and fixed costs, it becomes clear that the larger a system becomes, the more efficiently it tends to operate. This phenomenon is called “economies of scale.” For example, as a rail system operates additional train miles, its fixed costs remain stable, so the average cost per train mile operated will decrease. This chapter demonstrates that economies of scale create cost saving synergies that have a positive effect on the Ohio Hub System’s financial performance.

The costing approach originally developed for the Midwest Regional Rail System (MWRRS) was adapted for use in this study. Following the MWRRS methodology, eleven specific cost areas were identified. As shown in Exhibit 6-1 train miles impact the variable cost of equipment maintenance, energy and fuel, and train and onboard service crews. Passenger miles drive insurance liability costs. Ridership influences marketing, sales and station costs. Fixed costs include administrative costs, track and right-of-way maintenance costs, and feeder bus costs.

**Exhibit 6-1: Categories and Primary Cost Drivers**

Drivers		Cost Categories
<i>Train Miles</i>	→	Equipment Maintenance Energy and Fuel Train and Engine Crews OBS Crews Operator Profit
<i>Passenger Miles</i>	→	Insurance Liability
<i>Ridership and Revenue</i>	→	Sales and Marketing Station Costs <sup>33</sup>
<i>Fixed Cost</i>	→	Service Administration Track and ROW Maintenance Feeder Bus

<sup>33</sup> Station costs are affected only slightly by ridership, therefore this cost can be considered fixed for practical purposes.

Operating costs were developed for the Ohio Hub based on the following premises:

- Based on results of recent studies, a variety of sources including suppliers, current operators' histories, testing programs and prior internal analysis from other passenger corridors were used to develop the cost data. However, as the Ohio Hub is implemented, actual costs will be subject to negotiation between the passenger rail authority and the contract rail operator(s).
- Freight railroads will maintain the track and right-of-way, but ultimately, the actual cost of track maintenance will be resolved through negotiations with the railroads.
- Maintenance of train equipment will be contracted out to the equipment supplier.
- Operating expenses for train operations, crews, management and supervision were developed through a bottoms-up staffing approach.
- A detailed Business Plan for providing a Ohio Hub express parcel and delivery service was not developed, but based on the results from a MWRRS analysis, the net contribution of express parcel service was estimated as 5 percent of passenger revenues in the High-Speed Scenarios.
- Train operating practices follow existing work rules for crew staffing and hours of service.
- Following US General Accounting Office (GAO) requirements, this analysis was conducted using real dollar terms without considering inflation. Inflation is treated in the Net Present Value calculations by using a real interest rate for discounting future cash flows.

Those scenarios having MWRRS connectivity show considerably better financial performance. This analysis makes a strong case for cost and revenue synergies that occur when a passenger service is developed as an integrated *network* of high-speed lines rather than as individual, isolated corridors:

- The Ohio Hub study evaluates both *High-Speed* (110-mph) and *Modern* (79-mph) scenarios. The 2004 study also evaluated a 79-mph *Start-up*<sup>34</sup> scenario. Additionally in the 2004 study, the *High-Speed* and *Modern* scenarios were evaluated both as *Stand-alone* systems and *with MWRRS connectivity*. The *Start-up* scenario was evaluated only as a stand-alone system. Four combinations of route alternatives were evaluated for the *High-Speed* and *Modern* scenarios with MWRRS connectivity, to determine which set of routes performed best. Each scenario had a different costing basis, which reflected its train speeds and appropriate economies of scale. While some MWRRS costs were adjusted downward to reflect the lower cost of operating the smaller 200-seat trains assumed by the 2004 Ohio Hub business plan, other costs were adjusted upwards to reflect a lack of economies of scale in a Ohio Hub Start-up System.

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<sup>34</sup> High-Speed Scenarios include passenger train speeds to 110-mph, while Modern Scenarios limit speeds to their current 79-mph. Both the High-Speed and Modern scenarios increase frequency of train service to eight round-trips per day on each corridor except for Buffalo/Toronto, which has only five round-trips. The 79-mph Start-up scenario has two daily round-trips on each corridor.

- The updated 2007 study builds on the “preferred option” that was identified by the 2004 study: Option 1 – Detroit Airport + Youngstown, adding the three “incremental” corridors. As well, a new Implementation plan, as described in Chapter 7, was developed that adds the “incremental” corridors into the Ohio network. The financial performance of the network was projected on a year-by-year basis and revised Cost Benefit ratios have been calculated.

The costing model used for the “Incremental Corridors” evaluation follows the same basic framework as the original 2004 work. However, some adjustments to specific cost items have been incorporated as a result of the 2007 business plan update.

## **6.1 Ohio Hub Business Plan – Fixed Costs**

### **6.1.1 Track and Right-of-Way Costs**

Currently, it is industry practice for passenger train operators providing service on freight-owned rights-of-way to pay for track access, dispatching and track maintenance. The rates for all of these activities will ultimately be based upon a determination of the appropriate costs that result from negotiations between the parties. The purpose here is to provide estimates based on the best available information; however, it is important to recognize that the Ohio Hub Study is a feasibility-level analysis and that as the project moves forward, additional study and discussions with the railroads will be needed to further refine these cost estimates. Both capital and operating costs will be estimated. All costs are developed in 2002 constant dollars based on projected 2025 freight traffic levels.

When fully implemented, the Ohio Hub would provide the Ohio and Lake Erie region an increase in the maximum authorized speed as well as the frequency of train service. In order to accommodate the passenger trains on some heavily used corridors, the Ohio Hub assumes a substantial increase in capacity. Once constructed, these railroad improvements will need to be maintained to FRA standards required for reliable and safe operations.

The costing basis assumed in this report is that of *incremental* or *avoidable* costs. Avoidable costs are those that are eliminated or saved if an activity is discontinued. The term *incremental* is used to reference the change in costs that results from a management action that increases volume, whereas *avoidable* defines the change in costs that results from a management action that reduces volume.

The following is a list of cost components that are included within the Track and Right-of-Way category:

- **Track Maintenance Costs.** Incremental costs for track maintenance were estimated based on Zeta-Tech's January 2004 draft technical monograph Estimating Maintenance Costs for Mixed High-Speed Passenger and Freight Rail Corridors. The specific assumptions employed for this Study are discussed in the following pages. However, Zeta-Tech's costs are conceptual and are still subject to negotiation with the freight railroads.
- **Dispatching Costs and Out-of-Pocket Reimbursement.** Passenger service must also reimburse a freight railroad's added costs for dispatching its line, providing employee efficiency tests and for performing other services on behalf of the passenger operator. Based on the MWRRS study, a reimbursement rate of 39.5¢ per train mile was assessed in both the Modern and High-Speed Scenarios to cover these freight railroad costs. This 39.5¢ rate is about half the level of Amtrak's current costs, reflecting the economy of scale inherent in a large regional passenger rail network. However, there is no reason to assume any economies of scale in a small "Start-up" operation having only two round-trips per day, so Amtrak's full cost of 79¢ per train mile was assumed in that scenario. These costs are included as part of Track and Right-of-Way Maintenance costs in the calculation of operating results.
- **Costs for Access to Track and Right-of-Way.** Access fees, particularly train mile fees incurred as an operating expense, are specifically excluded from this calculation. Any such payments would have to be calculated and negotiated on a route-specific and railroad-specific basis. Such a calculation would have to consider the value to the freight railroad of the infrastructure improvements made by the Ohio Hub as well as track maintenance payments. The Ohio Hub Financial Analysis assumes that right-of-way access will be purchased "up front" as a capital expense, rather than on an ongoing basis as an operating expense. A capital expense placeholder for right-of-way access has been calculated based on underlying land values, and is included in the total capital cost estimate in Chapter 2 of this report.

Similar concerns exist in the case of incentive payments for on-time performance. The infrastructure improvements to freight corridors called for in this study should provide enough capacity to allow superior on-time performance for both freight and passenger operations. The need for additional incentive payments will be unclear until performance data is obtained from actual post-implementation passenger rail operations.

Route-specific track maintenance costs were developed by subdividing each line into short segments. Wherever train speed, tonnage or number of tracks changed, a new line segment was created. Freight tonnage data was supplied by ORDC based on railroad tonnage maps and other available information. Annual growth rates of 2-5 percent were applied to project future year 2025 freight tonnages. Track configuration data was based on railroad track charts as well as the proposed capital upgrade plan described in Chapter 2.

The difference in cost required to maintain a higher class of track for passenger train operations is called the “maintenance increment.” For 90-mph Class 5 and 110-mph Class 6 segments, Zeta-Tech’s cost per track mile coefficients were used to calculate the freight maintenance increment depending on the level of freight tonnage. On top of this, a flat rate of \$1.56 per train mile as used in the Zeta-Tech report, was added to reflect the direct cost of added passenger tonnage.

The Zeta-Tech report also used \$1.56 as the cost-per-mile for passenger operation on 79-mph Class 4 segments. This cost that was developed by Zeta-Tech’s TrackShare<sup>®</sup> model includes not only directly variable costs, but also an allocation of a freight railroad’s fixed cost. Accordingly, it complies with the Surface Transportation Board’s definition of “avoidable cost.” Track maintenance costs have two main components:

- *Operating costs* cover expenses needed to keep existing assets in service and include a regimen of facility inspections.
- *Capital costs* are those related to the physical replacement of the assets that wear out. They include expenditures such as for replacement of rail and ties, but these costs are not incurred until many years after construction. Therefore, capital maintenance costs are gradually introduced using a table of ramp-up factors provided by Zeta-Tech (Exhibit 6-2). A normalized capital maintenance level is not reached until 20 years after completion of the Ohio Hub rail upgrade program.

**Exhibit 6-2: Capital Cost Adjustments Following Upgrade of a Rail Line**

Year	% of Capital Maintenance	Year	% of Capital Maintenance
0	0%	11	50%
1	0%	12	50%
2	0%	13	50%
3	0%	14	50%
4	20%	15	75%
5	20%	16	75%
6	20%	17	75%
7	35%	18	75%
8	35%	19	75%
9	35%	20	100%
10	50%		

In the Ohio Hub Business Plan, only the operating component of track maintenance cost is treated as a direct operating expense. Capital maintenance costs are incorporated into the Ohio Hub Financial Plan and can be repaid using direct grants or from surplus operating cash flow. The latter option has been assumed in this study. Accordingly maintenance capital expenses only reduce the net cash flow generated from operations, and do not affect the operating ratio calculations. The annual amount of this capital cost is shown in the Cash Flow Analysis for the Ohio Hub System. The Capital Track maintenance line shown in the Benefit Cost analysis is based on the Net Present Value of the total capital track maintenance cost over the lifetime of the project – the NPV that appears in the Benefit Cost analysis is not the same as the annual sum, which can be calculated by applying the factors shown in Exhibit 6-2.

### Segment-specific Assumptions

Infrastructure and capital planning for 110-mph operation, particularly in the Cleveland-Columbus-Cincinnati corridor is highly conceptual and is still subject to field verification and additional discussion with the freight railroads. The current capital plan may be regarded as conservative, pending completion of a detailed line capacity analysis for each track segment. A detailed line capacity simulation is especially needed for the suggested commingled line segments, as shown in Exhibit 6-3.

In developing maintenance costs, dedicated passenger tracks were assumed where 110-mph passenger service operates alongside high-density freight lines, as well as on lower-speed urban sections (i.e., Berea-Cleveland and Ivorydale Junction-Cincinnati) that were costed as 79-mph dedicated tracks. Given the level of freight traffic congestion that currently exists in these urban areas, reliable passenger service cannot be provided without augmenting capacity. Freight railroads could also use these tracks for their own trains, but they must be able to ensure priority dispatching for passenger access to the downtown Cincinnati and Cleveland terminals. For the 3-C line, the exact placement of dedicated track segments has yet to be defined. Some assumptions, as detailed in Exhibit 6-3, had to be made regarding the need for shared vs. dedicated usage in order to complete the cost calculations.

**Exhibit 6-3: Track Maintenance Segment Costing Assumptions**

Line Segment	Maintenance Costing Basis	Assumed Speed
Toledo-Detroit, either route	Commingled	110-mph
Cleveland-Pittsburgh via Alliance	Commingled	79-mph
Buffalo-Toronto via Niagara Falls	Commingled	79-mph
Galion-Dayton via Columbus	Commingled	110-mph
Toledo-Berea	Dedicated	110-mph
Berea-Cleveland	Dedicated	79-mph
Cleveland-Buffalo	Dedicated	110-mph
Galion-Berea	Dedicated	110-mph
Dayton-Ivorydale Jct	Dedicated	110-mph
Ivorydale Jct-Cincinnati	Dedicated	79-mph
Ravenna-New Castle via Youngstown	Dedicated	110-mph
Pittsburgh-Steubenville via Panhandle	Commingled	79-mph
Steubenville -Columbus via Panhandle	Commingled	110-mph
Columbus-Fort Wayne	Commingled	110-mph
Dunkirk-Toledo	Commingled	110-mph

Costing a track as dedicated infrastructure does not mean that freight trains will be prohibited from using it. Rather, it suggests that passenger trains as the primary user will pay the entire cost of maintaining the track and is a conservative assumption, since current costing ignores any possibility of freight or commuter train use. Sharing the cost of dedicated facilities with other trains up to the capacity of the facility would reduce the cost to the passenger operation since

fixed costs could be shared with other traffic<sup>35</sup>. The added line capacity provided by the Ohio Hub may be especially attractive for additional intermodal trains that cannot be effectively accommodated within the capacity of existing rail facilities. Possible fees for using Ohio Hub dedicated tracks and cost-sharing opportunities will be subject to negotiation with the freight railroads and local transit agencies.

Dedicated segments were costed assuming Ohio Hub pays the full Zeta-Tech mileage cost of maintaining a single track plus \$1.56 per passenger train mile. The Zeta-Tech methodology does not specifically address the costing of dedicated tracks, but implies that this additional \$1.56 per passenger train mile should always be added to the track mile cost. Therefore, the \$1.56 additive has been included as a conservative assumption, which more than covers the cost for occasionally using adjacent freight tracks (at a reduced speed) for meeting other passenger trains.

For calculation of operating costs in the Modern Scenario, since 79-mph operations do not require improving track conditions beyond FRA Class 4, there is no need to upgrade the FRA track class. Accordingly, a flat rate of \$1.56 per train mile<sup>36</sup> was used on all lines for costing both the 79-mph Modern and Start-up Scenarios.

The Buffalo-Toronto segment was also costed at \$1.56 per train mile since the current Business Plan assumed no speed improvements between Niagara Falls and Buffalo, or in Canada. From Cleveland to Buffalo, the need to maintain a high-speed dedicated track<sup>37</sup> for only five round-trips per day results in a very high cost. However, averaging that dedicated track cost across the entire length of the corridor results in a quite reasonable \$5.20 per train mile, which is a level of cost that can be supported by the projected revenues of the route.

For passenger service on 79-mph segments of the Cleveland-Pittsburgh route, dedicated tracks are not needed except for capacity reasons<sup>38</sup>. While a detailed line capacity study was not funded as part of the current planning phase, given the high level of freight traffic the capital cost conservatively assumed (pending the outcome of a simulation analysis) that a third track would have to be provided from Cleveland to Beaver Falls, a distance of 108.8 miles, in both the High-Speed and Modern Scenarios<sup>39</sup>. The proposed added track would be constructed to FRA Class 4 standards and could operate on a commingled basis. Cleveland-Pittsburgh track maintenance on the Alliance line was costed at the \$1.56 per passenger train mile standard rate with no increment

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<sup>35</sup> TEMS estimates the incremental cost for freight use of Class 6 dedicated track may work out to approximately 20¢ per car mile, which is in the same range of cost that freight railroads typically pay each other for trackage rights. Any payment beyond this would contribute towards covering fixed costs. Since freight access will probably be priced on a car mile rather than train mile basis, due to the large size of modern trains only a few freight trains may be needed to significantly reduce the Cleveland Hub's share of cost on dedicated lines. Freight capacity sharing may be particularly important for the economics of adding a third track to the CSX Cleveland-Buffalo line, since passenger trains would consume only a small fraction of the new track's available capacity.

<sup>36</sup> \$1.56 per train mile is slightly more than Amtrak is currently paying to U.S. freight railroads for track maintenance costs.

<sup>37</sup> Attempting to commingle passenger and freight on the existing CSX freight tracks would be even *more* expensive, since *two* tracks would have to be upgraded to Class 6 and maintained under heavy freight traffic. The most economical solution may be to upgrade the lightly used NS corridor instead. Doing this might avoid the cost of constructing new, dedicated track and require only a *single* existing NS track to be improved to Class 6 standards.

<sup>38</sup> Based purely on track maintenance cost savings, high-speed trains should be separated from heavy freight tonnage operations beyond about 20-50 MGT per track. For conventional speeds, line capacity considerations mainly determine the investment need.

<sup>39</sup> Instead of triple-tracking Cleveland to Beaver Falls, a better strategy for freight may be to instead upgrade the W&LE Orrville-Bellevue line. Orrville to Oak Harbor is a distance of only 98 miles compared to the current 108.8 mile Cleveland to Beaver Falls triple-tracking plan, and may have the additional benefit of avoiding the need to triple track from Cleveland to Toledo as well. This reroute would put Pittsburgh-Chicago through freight trains on a shorter, more direct line that would bypass the Cleveland urban area.

needed for maintaining a higher track standard. On the Youngstown alignment, only the middle portion from Ravenna to New Castle operates on dedicated high-speed track yielding an overall cost of \$2.28 per train mile.

The Cleveland-Cincinnati or 3-C Corridor has an operating cost of \$5.11 per train mile, due to a high proportion of 110-mph trains running, along with this corridor's heavy reliance on dedicated lines. The Galion-Dayton segment of the 3-C corridor was costed as a single track, 110-mph shared line with 20 percent double track for passing sidings. The Ohio Hub pays the incremental cost for maintaining a higher track class under projected 2025 freight traffic volumes. Commingling with freight from Galion to Columbus slightly reduces the cost, but freight tonnage is higher from Columbus to Dayton, therefore making little difference to the level of operating costs whether the existing freight track is shared there or not. However, a shared track from Columbus to Dayton would reduce the capital cost.

The Cleveland-Detroit corridor assumes a 110-mph dedicated track from Cleveland to Toledo shared with MWRRS passenger trains. In MWRRS connectivity scenarios, Cleveland to Toledo train mile costs are very reasonable since the cost can be divided over eight Ohio Hub plus eight MWRRS round trips. This calculation produces an operating cost of \$3.53 per train mile for the Ohio Hub Stand-alone System or \$2.36, if half of Cleveland-Toledo cost can be assigned to the MWRRS.

Costs for track maintenance on the three incremental corridors were all set at a comparable level to what had been earlier developed for the Chicago to Fort Wayne portion of the MWRRS corridor, about \$3.79 per train-mile. This compares to \$2.09 per train-mile that was assumed for 79-mph comingled operations and reflects a reasonable increment for maintaining Class 6 tracks on a lightly-used freight line.

Exhibit 6-4 shows the operating expense per train mile (excluding capital maintenance) for each of the four Ohio Hub corridors. It should be noted that compared to the \$5.25 per train mile assumed in an earlier analysis of the Ohio Hub, these revised track maintenance costs compare quite favorably and have even been reduced from earlier figures. Exhibit 6-5 shows overall operating and capital costs for each corridor by year.

Exhibit 6-4: Track Operating Maintenance Cost per Train Mile (\$2002)

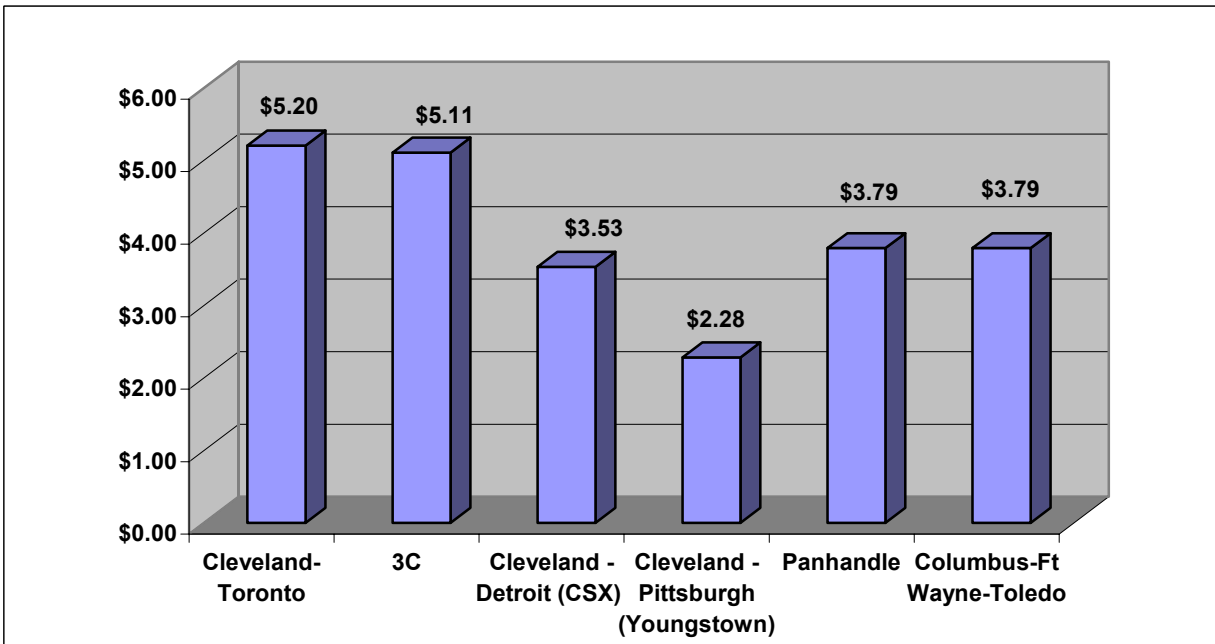


Exhibit 6-5: Ohio Hub Track Maintenance Cost by Year (in thousands of 2002 \$)

Corridors: High-Speed Shared with Midwest Scenario	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
<b><i>Cleveland-Detroit via Airport</i></b>															
Track & RoW Maint	\$0	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139
Capital MofW	\$0	\$0	\$0	\$0	\$217	\$365	\$473	\$893	\$1,027	\$1,109	\$1,458	\$1,593	\$1,674	\$1,884	\$1,884
<b><i>Cleveland-Pittsburgh via Youngstown</i></b>															
Track & RoW Maint	\$0	\$0	\$0	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593
Capital MofW	\$0	\$0	\$0	\$0	\$84	\$141	\$182	\$344	\$396	\$427	\$561	\$613	\$644	\$725	\$725
<b><i>Cleveland-Niagara Falls</i></b>															
Track & RoW Maint	\$0	\$0	\$0	\$0	\$0	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358
Capital MofW	\$0	\$0	\$0	\$0	\$0	\$296	\$384	\$724	\$834	\$900	\$1,183	\$1,292	\$1,358	\$1,529	\$1,529
<b><i>Cleveland-Columbus-Cincinnati</i></b>															
Track & RoW Maint	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581
Capital MofW	\$0	\$0	\$0	\$0	\$345	\$580	\$753	\$1,420	\$1,634	\$1,763	\$2,318	\$2,533	\$2,662	\$2,996	\$2,996
<b><i>Pittsburgh-Columbus via Panhandle</i></b>															
Track & RoW Maint	\$0	\$0	\$0	\$0	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256
Capital MofW	\$0	\$0	\$0	\$0	\$118	\$199	\$258	\$487	\$560	\$604	\$795	\$868	\$913	\$1,027	\$1,027
<b><i>Columbus-Fort Wayne-Toledo</i></b>															
Track & RoW Maint	\$0	\$0	\$3,027	\$3,027	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165
Capital MofW	\$0	\$0	\$0	\$0	\$271	\$455	\$591	\$1,114	\$1,282	\$1,384	\$1,819	\$1,988	\$2,089	\$2,351	\$2,351

Exhibit 6-5 (continued): Ohio Hub Track Maintenance Cost by Year (in thousands of 2002 \$)

Corridors: High-Speed Shared with Midwest Scenario	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b><i>Cleveland-Detroit via Airport</i></b>																
Track & RoW Maint	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139	\$4,139
Capital MofW	\$2,116	\$2,340	\$2,476	\$2,826	\$2,826	\$3,058	\$3,282	\$3,418	\$3,768	\$3,768	\$3,768	\$3,768	\$3,768	\$3,768	\$3,768	\$3,768
<b><i>Cleveland-Pittsburgh via Youngstown</i></b>																
Track & RoW Maint	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593	\$1,593
Capital MofW	\$815	\$901	\$953	\$1,088	\$1,088	\$1,177	\$1,264	\$1,316	\$1,451	\$1,451	\$1,451	\$1,451	\$1,451	\$1,451	\$1,451	\$1,451
<b><i>Cleveland-Niagara Falls</i></b>																
Track & RoW Maint	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358	\$3,358
Capital MofW	\$1,717	\$1,899	\$2,009	\$2,293	\$2,293	\$2,481	\$2,663	\$2,773	\$3,058	\$3,058	\$3,058	\$3,058	\$3,058	\$3,058	\$3,058	\$3,058
<b><i>Cleveland-Columbus-Cincinnati</i></b>																
Track & RoW Maint	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581	\$6,581
Capital MofW	\$3,365	\$3,722	\$3,937	\$4,494	\$4,494	\$4,863	\$5,220	\$5,435	\$5,992	\$5,992	\$5,992	\$5,992	\$5,992	\$5,992	\$5,992	\$5,992
<b><i>Pittsburgh-Columbus via Panhandle</i></b>																
Track & RoW Maint	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256	\$2,256
Capital MofW	\$1,153	\$1,276	\$1,350	\$1,541	\$1,541	\$1,667	\$1,789	\$1,863	\$2,054	\$2,054	\$2,054	\$2,054	\$2,054	\$2,054	\$2,054	\$2,054
<b><i>Columbus-Fort Wayne-Toledo</i></b>																
Track & RoW Maint	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165	\$5,165
Capital MofW	\$2,641	\$2,921	\$3,090	\$3,527	\$3,527	\$3,816	\$4,096	\$4,266	\$4,703	\$4,703	\$4,703	\$4,703	\$4,703	\$4,703	\$4,703	\$4,703

## **Station Operations**

For the Ohio Hub, a simplified fare structure, heavy reliance upon electronic ticketing and avoidance of a reservation system will minimize station personnel requirements. Station costs include personnel, ticket machines and station operating expenses. In producing the station operations figures, station costs were scaled to station size. For example, larger end-terminal stations have additional staffing requirements due to high passenger volumes while smaller stations with less volume have minimal staffing needs.

All stations were assumed open for two shifts. Five additional staff positions would be added to each currently staffed Amtrak station and eight positions at each new location. Unstaffed stations operate at a cost of \$68,808 per year; the incremental cost for stations currently staffed by Amtrak is \$330,620, and new, staffed stations would cost \$561,468 per year to operate<sup>40</sup>. The \$68,808 cost shown for unstaffed stations covers the cost of utilities, ticket machines, cleaning and basic facility maintenance, which is also included in the staffed station cost. The cost of additional personnel, including benefits, is approximately \$52,000 per person, per year.

The 2004 plan evaluated station costs were for three distinct scenarios: 110-mph High-Speed, 79-mph Modern and 79-mph Start-up, Exhibit 6-7 shows a Station Staffing Summary by Scenario, Exhibit 6-8 provides Station Expenses by Scenario. Costs for the High-Speed and Modern Scenarios were further evaluated based on shared versus non-shared operations with MWRRS. Exhibit 6-6 details the station-staffing assumptions used for the High-Speed Stand-alone, Modern Stand-alone and High-Speed Shared with MWRRS Scenarios.

- In the Modern Scenario, 12 of 32 Ohio Hub stations are staffed. Of these, Amtrak staffs 10 stations today, and the Ohio Hub System would add two new locations. The resulting cost levels are shown in Exhibit 6-8 and 6-9. For the implementation period 2010 through 2013, these costs were ramped-up based on the line segments scheduled to begin operation each year.
- In the High-Speed Scenario, the Study's demand forecast predicts substantial air-connect traffic at the station at Cleveland Airport. For this reason, the High-Speed Scenario Business Plan assumes a staffed station at the airport, while the two other suburban Cleveland stations remain unstaffed. With a conventional 79-mph service, air-connect travel is not expected to develop to any significant degree. Therefore, the Cleveland Airport station was not staffed under the Modern Scenario. This is the only difference in station costs between the Modern and High-Speed Scenarios.

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<sup>40</sup> The original cost in 1996 dollars for unstaffed locations was \$40,000 per year; for stations currently staffed by Amtrak \$268,300, and new staffed stations \$469,600 per year. In addition to this, the operating cost of ticket machines was \$20,000 per year for each station in 1996 dollars. Applying a 1996-2002 inflation factor to these costs yields the 2002 dollar values that are cited here.

**Exhibit 6-6: Station Staffing Detail by Scenario**

Stations	110-mph Operations - Ohio Hub Layers 2 + 3 *			
	Standard- Unstaffed	Standard- Staffed	Stand Alone Unstaffed	Stand Alone Staffed
Elyria		0		
Sandusky	0			
Toledo Amtrak		0		
Monroe			1	
Detroit Airport			1	
Dearborn		0		
Detroit Amtrak (New Center)		0		
Cleveland		0		
Cleveland Airport		0		
Galion			1	
North Columbus			1	
Columbus				1
Dayton				1
Middletown			1	
North Cincinnati		1		
Cincinnati		0		
S.E. Cleveland			1	
Warren	1			
Youngstown	1			
North Pittsburgh			1	
Pittsburgh		1		
N.E. Cleveland	1			
Ashtabula	1			
Erie	1			
Dunkirk	1			
Buffalo Exchange		1		
Niagara Falls NY	1			
Niagara Falls ONT	1			
St. Catherines	1			
Hamilton (Aldershot)	1			
Oakville	1			
Toronto		1		
Carnegie			1	
Steubenville			1	
Coshocton			1	
Newark				1
Port Columbus Airport			1	
Marysville			1	
Lima (towards Ft Wayne)				1
Findlay (towards Toledo)			1	
<b>TOTAL</b>	11	4	13	4

Exclude CDN  
Stations

\* Layer 1 stations included as part of MWRRS have a "Zero" next to them

**Exhibit 6-7: Station Staffing Summary by Scenario**

Stations	110-mph Operations - Ohio Hub Layers 2 + 3 *				Total
	Standard- Unstaffed	Standard- Staffed	Stand Alone - Unstaffed	Stand Alone - Staffed	
Cost/Station	\$68,808	\$330,620	\$68,808	\$561,468	
Detroit	0	0	2	0	2
3-C	0	1	3	2	6
Pittsburgh	2	1	2	0	5
Buffalo/Toronto	5	1	0	0	6
Panhandle	0	0	4	1	5
Cols-Ftw/Toledo	0	0	2	1	3
<b>Total Stations</b>	<b>7</b>	<b>3</b>	<b>13</b>	<b>4</b>	<b>27</b>

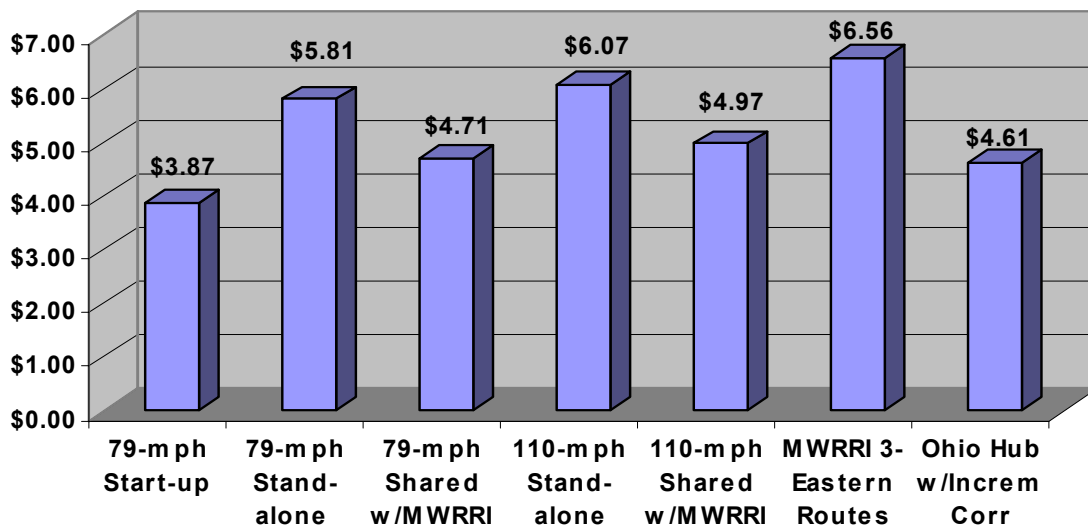
**Exhibit 6-8: Station Expenses by Scenario  
 (\$2002 in thousands)**

Stations	110-mph Operations - Ohio Hub Layers 2 + 3 *				Total
	Standard- Unstaffed	Standard- Staffed	Stand Alone - Unstaffed	Stand Alone - Staffed	
Detroit	\$0	\$0	\$137,616	\$0	\$137,616
3-C	\$0	\$330,620	\$206,424	\$1,122,936	\$1,659,980
Pittsburgh	\$137,616	\$330,620	\$137,616	\$0	\$605,852
Buffalo/Toronto	\$344,040	\$330,620	\$0	\$0	\$674,660
Panhandle	\$0	\$0	\$275,232	\$561,468	\$836,700
Cols-Ftw/Toledo	\$0	\$0	\$137,616	\$561,468	\$699,084
<b>Subtotal Ohio Hub</b>	<b>\$481,656</b>	<b>\$991,860</b>	<b>\$894,504</b>	<b>\$2,245,872</b>	<b>\$4,613,892</b>
Chicago-Toledo					\$2,051,494
Chicago-Cincinnati			--- From MWRRS Report ---		\$1,509,614
Michigan Lines					\$2,996,563
<b>Subtotal MWRRS Eastern Lines</b>					<b>\$6,557,672</b>
<b>Total</b>					<b>\$11,171,564</b>

The 2004 plan allocated the cost of shared MWRRS Detroit, Cincinnati and stations between Toledo and Cleveland 50/50 between the MWRRS and the Ohio Hub. Since five routes would use the downtown Cleveland station – four Ohio Hub routes plus the MWRRS – the Study assumed that the Ohio Hub System would retain 4/5 or 80 percent of the cost of the main Cleveland station. Once the allocation was calculated for the High-Speed Shared with MWRRS Scenario, the same percentage reduction was applied to the Modern Shared Scenario, as well (Exhibit 6-9). A detailed station staffing plan was not developed for the Start-up Scenario, but there is probably an opportunity for savings due to the lighter passenger volumes and less frequent train service. Savings could take the form either of staffing reductions, reduced station hours or fewer staffed stations. The Study assumed that station costs for the Start-up Scenario would be 2/3 that of the Modern Scenario.

The 2007 plan did not allocate any MWRRS station costs, but rather showed the cost of these stations as part of Layer 1 (the three Eastern MWRRS routes, \$6.56 Million total.) After this, Ohio Hub stations were added on an incremental basis (\$4.61 Million) Because the 2007 Ohio Hub station costs did not include any allocation of MWRRS costs, the incremental cost for adding the Ohio Hub routes was actually lower than estimated in the earlier 2004 Ohio Hub plan.

**Exhibit 6-9: Annual Total Station Cost<sup>40</sup> (Millions of 2002\$)**



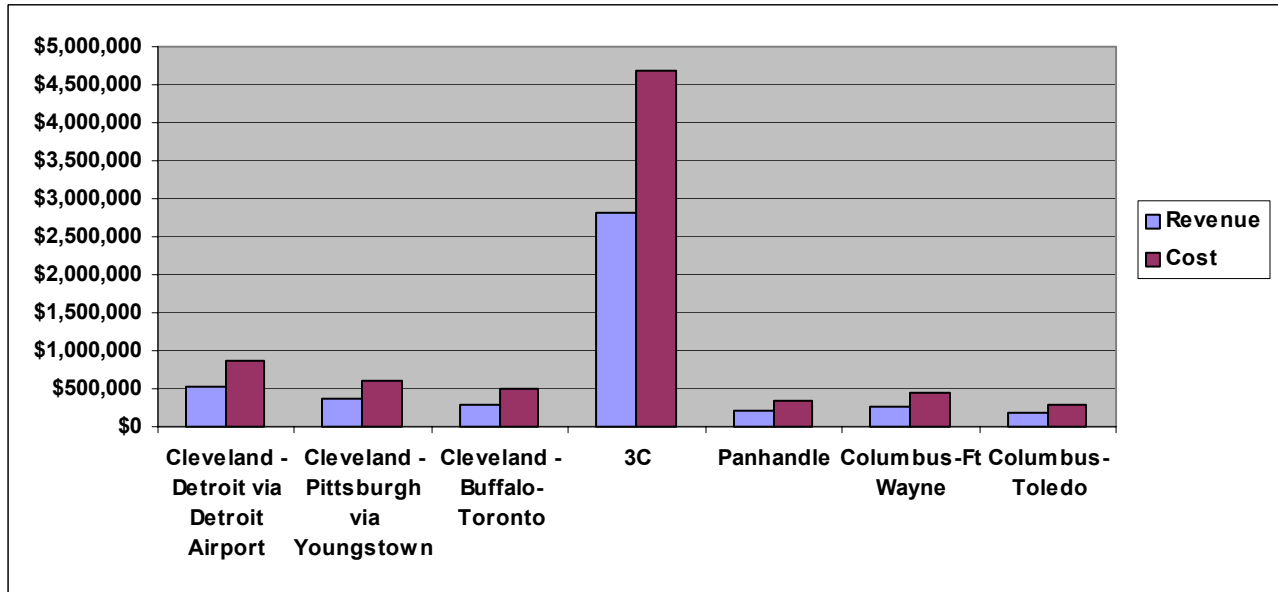
### 6.1.2 Feeder Bus Cost

A detailed feeder bus operating plan was not developed for the Ohio Hub; therefore, based on the MWRRRI Study, an average cost of \$10 per bus rider was assumed. Since the average bus revenue was only \$6 per rider, operation of the buses shows a direct operating loss. However, if connecting rail revenue is included, then operation of the feeder buses becomes profitable to the Ohio Hub System. The 3-C Corridor makes the greatest use of feeder buses due to the wide distribution of nearby medium-sized cities, especially on the north end of the corridor, that are

<sup>40</sup> Station costs are modeled as fixed and in constant 2002 dollars. Accordingly, these costs remain constant for all forecast years after the system has been fully implemented.

not located directly on the proposed rail route through central Ohio. Exhibit 6-10 gives the 2025 feeder bus costs and revenues by corridor as used in development of the 2007 Ohio Hub Business Plan.

Exhibit 6-10: 2025 Feeder Bus Revenues and Costs (2002\$)



### 6.1.3 Service Administration

For developing costs, a potential management organization for the Ohio Hub System was developed as a stand-alone structure, with no other responsibility than the operation of the Ohio Hub.<sup>41,42</sup> A detailed organization chart is included in the Appendix. The Ohio Hub System itself would retain only a small management staff for delivery audit, quality assurance and contract administration. TEMS added a 20 percent contingency, at Amtrak's request. Administrative costs are ramped up over a two-year implementation period, reflecting 70 percent of costs in Year 1, 80 percent of costs in Year 2, and 100 percent in Year 3. Exhibit 6-11 summarizes the overall costs of the management organization that was developed in the 2004 plan.

<sup>41</sup> Responsibilities would include liaison work with other rail and commuter lines, marketing, accounting, finance and interface activities with the States of Ohio, Michigan, Pennsylvania, New York and the Canadian Province of Ontario. Also included would be all operating department supervision as well as senior management, human resources, and police and security.

<sup>42</sup> Providers of equipment maintenance, on-board food service and express parcel service would have their own management structures; their administrative costs are included within those areas. As well, call center expenses are treated separately and described as Sales and Marketing costs.

**Exhibit 6-11: 2004 Study - Ohio Hub Administrative Costs**

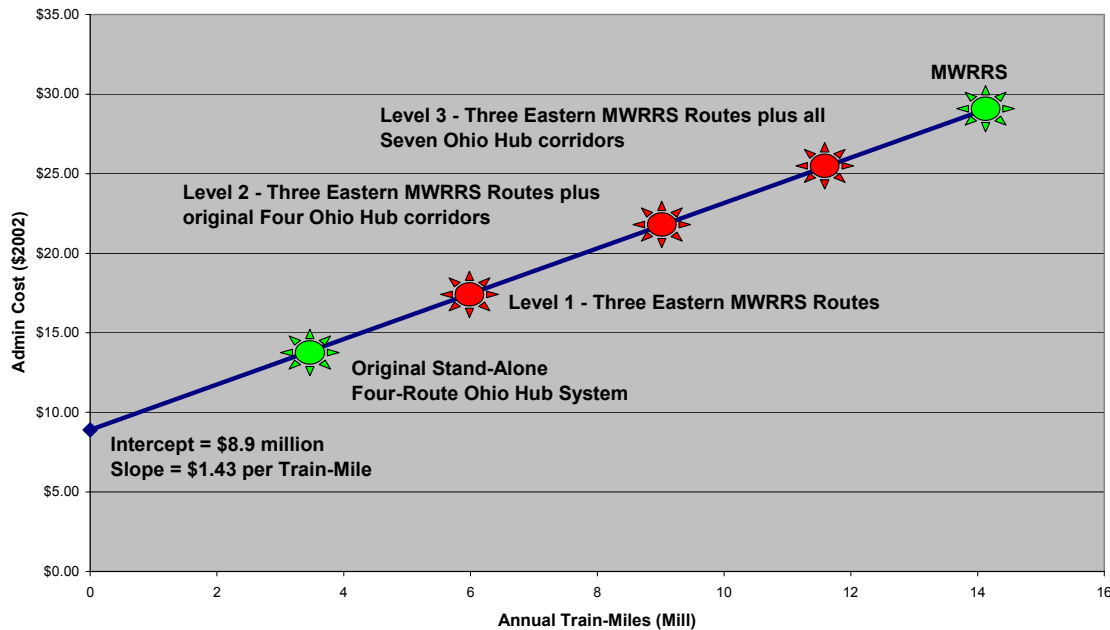
	Cleveland Hub Independent Operator			Merged w/MWRRS Organization		
	Top Mgmt	Staff	Total	Top Mgmt	Staff	Total
General Admin	\$2,065,224	\$2,244,888	\$4,310,112	\$516,306	\$2,244,888	\$2,761,194
Operations	\$1,025,448	\$2,648,206	\$3,673,654	\$256,362	\$2,648,206	\$2,904,568
Engineering/Mtce	\$699,215	\$1,568,341	\$2,267,556	\$174,804	\$1,568,341	\$1,743,145
<b>Staff Expense</b>	<b>\$3,789,887</b>	<b>\$6,461,435</b>	<b>\$10,251,322</b>	<b>\$947,472</b>	<b>\$6,461,435</b>	<b>\$7,408,907</b>
Office Lease	50% of MWRRS-->		\$4,035,875	25% of MWRRS-->		\$2,017,938
<b>TOTAL</b>			<b>\$14,287,197</b>			<b>\$9,426,844</b>

Administration costs were modeled differently in the 2004 study versus the 2007 update. The 2004 study developed two scenarios: shared with MWRRS, versus Ohio Hub stand-alone:

- For a shared operation, Ohio Hub would have to pay only for additional functional staff positions added to the MWRRS organization to support the added Ohio Hub train miles. In addition, the costing assumed that MWRRS top management (shown in light pink in the organization chart in the Appendix) would receive an additional 25 percent in pay, but that the top management organization would not have to be duplicated.
- In the standalone scenario, Ohio Hub would have to pay the full salaries of both the top management as well as the functional management staff (shown in dark blue.)
- The Start-up Scenario was costed at 50 percent of the level needed to support the fully built-out High-Speed or Modern Scenarios.

The challenge for the 2007 update was the fact that the networks to be compared were of different sizes and had different intensity of train operations. Therefore, an understanding of how administrative costs vary as a function of train miles was needed. A cost model was built by comparing the size of administrative organizations that had been previously developed by both the MWRRS and Ohio Hub. A larger network would require a greater number of management staff positions, but top management costs would be only slightly higher. *Based on this comparison, a fixed cost of \$8.9 million plus \$1.43 per train-mile was estimated for modeling administrative costs.* Use of this variable cost function allows administrative cost to be accurately estimated for different network configurations, without having to develop a detailed organization chart for each one.

Exhibit 6-12: 2007 Update - Ohio Hub Administrative Costs



### 6.1.4 Sales and Marketing

The primary expenses represented in this category consist of a \$2,293,538 per year fixed advertising cost<sup>43</sup>, plus fixed and variable call center expenses. Call center costs were built up directly from ridership, assuming 40 percent of all riders call for information, and that the average information call will take 5 minutes for each round trip. Assuming some flexibility for assigning personnel to accommodate peaks in volume and a 20 percent staffing contingency, variable costs come to 57¢ per rider plus a fixed supervisory cost of \$458,716 per year.

A simplified ticketing methodology for unreserved service should result in a substantial cost savings. While there are advantages to variable pricing based upon yield management principles, the Ohio Hub does not call for that level of sophistication in its early stages. Simplicity in fares and services will limit talk time and heighten the use of voice recognition, menu-driven or Internet-based systems.

The MWRRS Shared Scenario assumes a shared call center between the MWRRS and the Ohio Hub; therefore, the supervisory cost of \$458,716 per year can be eliminated. The Ohio Hub advertising budget remains the same under both the Shared and Stand-alone Scenarios – but it should be pointed out that any advertising expenditure will be much more *effective* for the larger combined system. The Start-up Scenario cuts the advertising budget in half to just \$1,146,769, but needs to support the \$458,716 call center supervision cost for a total of \$1,605,485.

Credit card commissions were modeled as 1.8 percent of revenue and travel agency commissions as 1 percent of revenue.

<sup>43</sup> In 1996 dollars, these costs were originally \$2 million per year advertising, \$400,000 in call center supervision. They have been inflated to \$2,293,538 and \$458,716 respectively, in 2002 dollars.

## **6.2 Ohio Hub Business Plan – Variable Costs**

### **6.2.1 Insurance Costs**

Liability costs were estimated at 1.1¢ per passenger-mile, the same rate per passenger mile as national Amtrak operations. Federal Employees Liability Act (FELA) costs are not included here but are applied as an overhead to labor costs. Forecast passenger miles by route are shown in Exhibit 5-6.

The Amtrak Reform and Accountability Act of 1997 (§161) provides for a limit of \$200 million on passenger liability claims. Amtrak carries that level of excess liability insurance, which allows Amtrak to fully indemnify the freight railroads in the event of a rail accident. This insurance protection has been a key element in Amtrak's ability to secure freight railroad cooperation. In addition, freight railroads perceive that the full faith and credit of the United States Government is behind Amtrak, while this may not be true of other potential passenger operators. A recent General Accounting Office (GAO) review<sup>44</sup> has concluded that this \$200 million liability cap applies to commuter railroads as well as to Amtrak. If the GAO's interpretation is correct, the liability cap may also apply to potential Ohio Hub franchisees. If this liability limitation were in fact available to potential Ohio Hub franchisees, it would be much easier for any operator to obtain insurance that could fully indemnify a freight railroad at a reasonable price. It is recommended that the ORDC seek qualified legal advice on this matter.

### **6.2.2 Operator Profit**

Institutional arrangements would identify the responsibilities of the states in deciding Ohio Hub policy and broad service delivery issues. These arrangements would also outline the responsibilities for management oversight of the rail operator, including periodic review of operating performance and contractor performance.

- A policy board would follow all the normal procedures of a governmental entity by allocating funds for the greatest public benefit, allowing public participation in all decision-making and by making complete and detailed financial disclosures.
- A rail service provider would operate in a commercial environment as a strictly private sector, for-profit, business enterprise. The service provider would make its decisions on a commercial basis and would be allowed to protect the confidentiality of its proprietary business data.

It is essential to the future of the Ohio Hub System to separate the policy board's requirement for service and funding oversight from the operator's business requirements to be profitable. As pointed out by the Amtrak Reform Council in 1997, the current Amtrak structure, by combining governmental and non-governmental functions in a single entity, does not do this. Amtrak might serve as an operator of the system, but authority and control over the allocation of capital dollars should be vested in the states and the FRA, rather than the operator.

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<sup>44</sup> See: <http://www.gao.gov/highlights/d04240high.pdf>

The Ohio Hub Business Plan assumes that the operator takes a 10 percent mark-up on directly-controlled costs, including insurance, stations, sales and marketing, administration, train crew, and energy and fuel. All other costs related to track maintenance, on-board service, equipment maintenance and express parcel service are out-sourced and are assumed to include their own profit margins. Alternatively, an equivalent amount could be allocated as a percentage of revenue. Gross operator profit is allocated to the operator as a performance incentive.

### **6.2.3 Train Equipment Maintenance**

Equipment maintenance costs include all costs for spare parts, labor and materials needed to keep equipment safe and reliable. The costs include periodical overhauls in addition to running maintenance. It also assumes that facilities for servicing and maintaining equipment are designed specifically to accommodate the selected train technology. This arrangement supports more efficient and cost-effective maintenance practices. Acquiring a large fleet of trains with identical features and components, allows for substantial savings in parts inventory and other economies of scale. In particular, commonality of rolling stock and other equipment will standardize maintenance training, enhance efficiencies and foster broad expertise in train and system repair.

For consistency with the MWRRS business planning process, the Ohio Hub has chosen to adopt the MWRRS' higher cost assumption of \$9.87 per train mile (for a 300-seat train) that was recently agreed to by the MWRRRI Steering Committee. Before this figure can be used for the Ohio Hub, however, it must be adjusted to reflect the smaller 200-seat train that will be used by the Ohio Hub System. Data provided by equipment manufacturers at the original MWRRRI 1999 equipment symposium was used to calculate these adjustments, using the higher \$9.87 cost as the base. The smaller 200-seat train was estimated to cost \$8.95 per train mile, a savings of 92¢ per train mile over the MWRRS rate. Using manufacturers' data from the 1999 equipment symposium, equipment costs was adjusted upwards in the Start-up Scenario to \$12.38 per train mile, to reflect the lack of economies of scale.

In High-Speed Scenarios with MWRRS Connectivity, a larger 300-seat train with its higher equipment maintenance and fuel cost is needed on the 3-C Corridor line. The 2004 study assumed a 200-seat train on all the other corridors and in all Modern and Stand-alone Scenarios.

Train costs in the 2007 update are the same as in the 2004 plan, but because of the higher forecasted ridership in the 2007 update, now reflect the use of larger 300-seat trains. These trains cost \$9.87 per train-mile, the same as before, in the 110-mph scenarios. The 79-mph scenarios continue to use smaller 200-seat trains costing \$8.95 per train-mile except for Columbus-Fort Wayne, which still uses the larger 300-seat train for compatibility with the MWRRS.

### **6.2.4 Train and Engine Crew Costs**

Crew costs are those costs incurred by the onboard train operating crew. The operating crew consists of an engineer, a conductor and an assistant conductor and is subject to federal Hours of Service regulations. Costs for the crew include salary, fringe benefits, training, overtime and additional pay for split shifts and high mileage runs. An overtime allowance is included as well as scheduled time-off, unscheduled absences and time required for operating, safety and passenger handling training. Fringe benefits include health and welfare, FICA and pensions. The

cost of employee injury claims under FELA is also treated as a fringe benefit for this analysis. The overall fringe benefit rate was calculated as 55 percent. In addition, an allowance was built in for spare/reserve crews on the extra board. The costing of train crews was based on Amtrak's 1999 labor agreement, adjusted for inflation to 2002.

Crew costs depend upon the level of train crew utilization, which is largely influenced by the structure of crew bases and any prior agreements on staffing locations. Train frequency strongly influences the amount of held-away-from-home-terminal time.

Since train schedules have continued to evolve throughout the lifetime of the Ohio Hub Study, a parametric approach is needed to develop a system average per train mile rate for crew costs. Such an average rate necessarily involves some approximation across routes, but to avoid having to reconfigure a detailed crew-staffing plan whenever the train schedules change, an average rate is necessary and appropriate for a planning-level study.

Without developing a detailed base crew plan, the total number of equipment operating hours was estimated based on a prior equipment cycling analysis. For each train set, this determined a sequence of schedule pairings<sup>45</sup> whereby the total duration of equipment use could be measured. The total number of hours was calculated from the start of the first daily equipment assignment, until the end of the last equipment assignment. Crews would be paid for layover times, unless the layovers were long enough to allow splitting the shift. This total number of operating hours for each train set was divided by an eight-hour shift, and then rounded up to the next highest whole number.

For the High-Speed Scenario, train scheduling allows all crews to run round trips with no need for overnight accommodations except for the Cleveland-Buffalo/Toronto corridor. This highly efficient crew utilization reduces costs to \$3.42 per train mile, which is lower than the system average cost assumed for MWRRS service. In the Modern Scenario, longer layovers and more overnight stays are necessary, raising the average cost to \$3.94 per train mile, about the same as the MWRRS crew cost. Much poorer crew utilization in the Start-up Scenario raises the average cost to \$6.60 per train mile.

Once operational, the Ohio Hub System will employ a far greater number of workers than existing passenger rail service in the Ohio region. Since operating personnel are compensated at an hourly rate, if the number of miles gained in one hour increases, the cost per mile decreases. Consequently, the operating cost per train mile drops as train speed increases. In addition, further productivity improvements can be achieved because of the higher train frequencies that reduce crew layover times at away-from-home-terminals.

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<sup>45</sup> As defined in Section 7.5 of the MWRRS report.

### **6.2.5 Fuel and Energy**

A consumption rate of 2.42 gallons/mile was estimated for a 110-mph 300-seat train, based upon nominal usage rates of all three technologies considered in Phase 3 of the MWRRS Study. Savings in fuel costs were assumed because of large bulk purchases at central locations and the use of modern transfer equipment at new servicing facilities. With new trains and train-related technologies, substantial fuel savings are expected to accrue to the Ohio Hub System.

In the 2004 plan, a diesel fuel cost of \$0.96 per gallon led to a train mile rate of \$2.32 per train mile for a 110-mph 300-seat train. However, these fuel costs were reduced for the Ohio Hub because of use of a smaller train, and for lower speed operations in the Modern and Start-up Scenarios. This cost was reduced to \$1.97 in the Ohio Hub High-Speed Scenarios for a smaller 200-seat train; and to \$1.58 in the Modern Scenario, assuming an additional 20 percent fuel savings due to lower speed operations.

For the 2007 update, fuel costs were been raised from \$2.32 per train-mile (for a 300-seat train) up to \$3.62 per train-mile, reflecting a slightly more than 50% increase in the cost of diesel fuel. Fuel costs for smaller 200-seat or slower 79-mph trains were reduced by the same proportion that they had been in the earlier 2004 plan.

### **6.2.6 Onboard Services (OBS)**

Onboard service (OBS) costs are those expenses for providing food service onboard the trains. OBS adds costs in three different areas: equipment, labor and cost of goods sold. Equipment capital and operating cost is built into the cost of the trains and is not attributed to food catering specifically. However, the Ohio Hub Study assumes none of the small 200-seat trains will have a dedicated dining or bistro car. Instead, an OBS employee or food service vendor would move through the train with a trolley cart, offering food and beverages for sale to the passengers. Larger 300-seat trains may be able to provide a small walk-up café area where the attendant works when not passing through the train with the trolley cart.

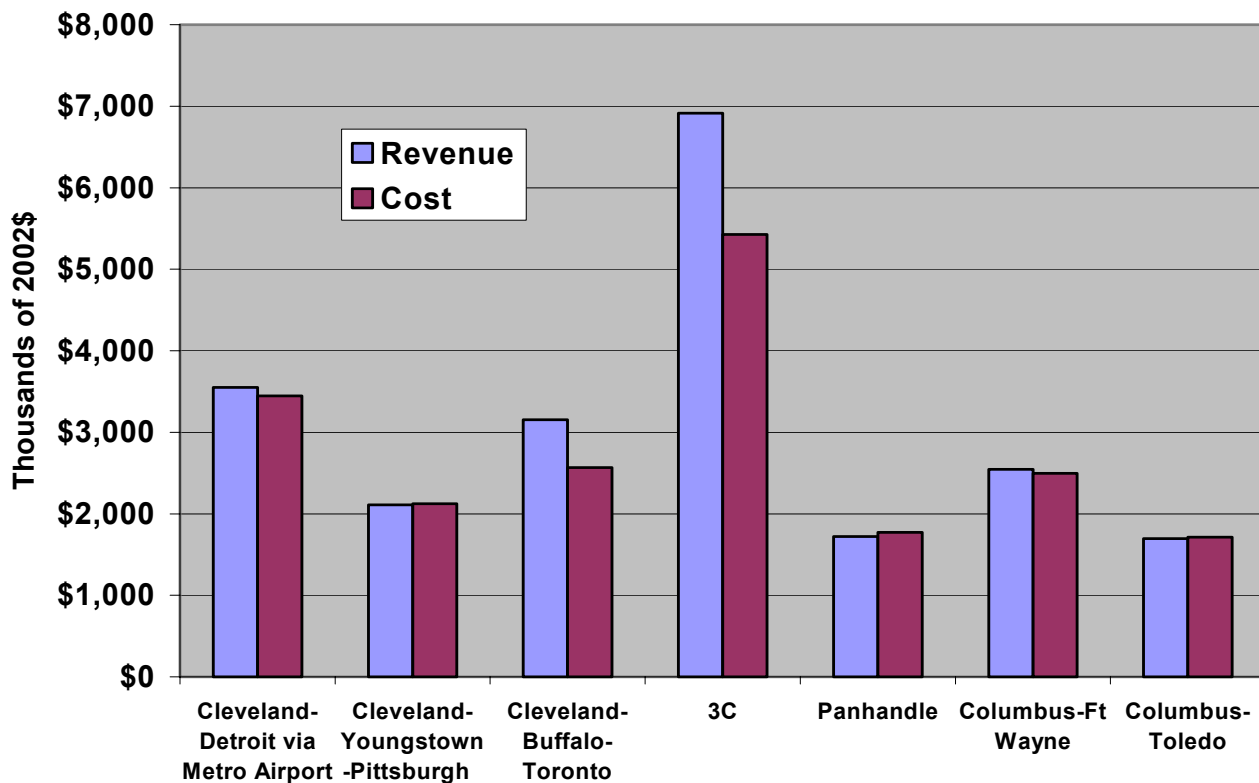
The goal of the OBS franchising should be to ensure a reasonable profit for the provider of onboard services, while maintaining a reasonable and affordable price structure for passengers. The key to attaining OBS profitability is selling enough products to recover the train mile related labor costs. If smaller 200-seat Ohio Hub trains were used for ramp-up, given the assumed cost structure, even with a trolley cart service the OBS operator will be challenged to attain profitability. However, the expanded customer base on larger 300-seat trains provides a slight positive operating margin for OBS service in the fully built-out 2025 network.

In practice, it is difficult for a bistro-only service to sell enough food to recover its costs. Bistro-only service may cover its costs in Amtrak's northeast corridor that operates very large trains, but it will be difficult to scale down to a MWRRS or Ohio network that operates smaller 200 to 300-seat trains. While only a limited menu can be offered from a cart, the ready availability of food and beverages at the customer's seat is a proven strategy for increasing sales. Many customers appreciate the convenience of a trolley cart service and are willing to purchase food items that are brought directly to them. While some customers prefer stretching their legs and walking to a bistro car, other customers will not bother to make the trip.

The cost of goods sold is estimated as 50 percent of OBS revenue, based on Amtrak’s route profitability reports. Amtrak estimated labor costs, including the cost of commissary support and OBS supervision, at \$1.53 per train mile. This cost is consistent with Amtrak’s level of wages and staffing approach for conventional bistro car services. However, the Ohio Hub Business Plan recommends that an experienced vendor provide food services and uses a trolley cart approach.

A key requirement for providing trolley service is to ensure the doors and vestibules between cars are designed to allow a cart to easily pass through. Since trolley service is a standard feature on most European railways, most European rolling stock is designed to accommodate the carts. Although convenient passageways often have not been provided on U.S. equipment, the ability to support trolley carts is an important design requirement for the planned Ohio Hub service. The costs for this service relate to the provision of trolleys and storage space on the train, a commissary facility used to refurbish the carts and the onboard-service staff.

Exhibit 6-13: 2025 Forecast OBS Revenues and Costs

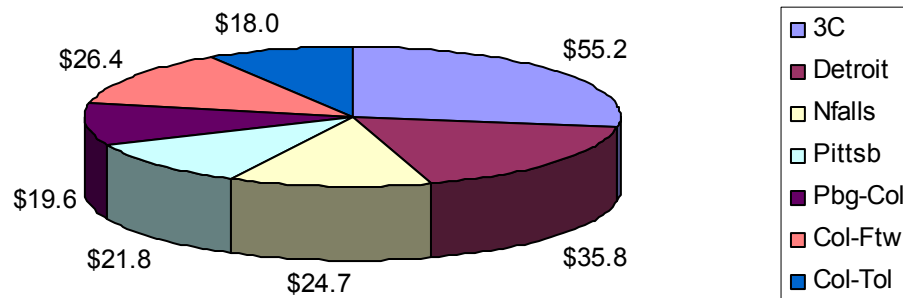


**Exhibit 6-14: Summary of Unit Costs**

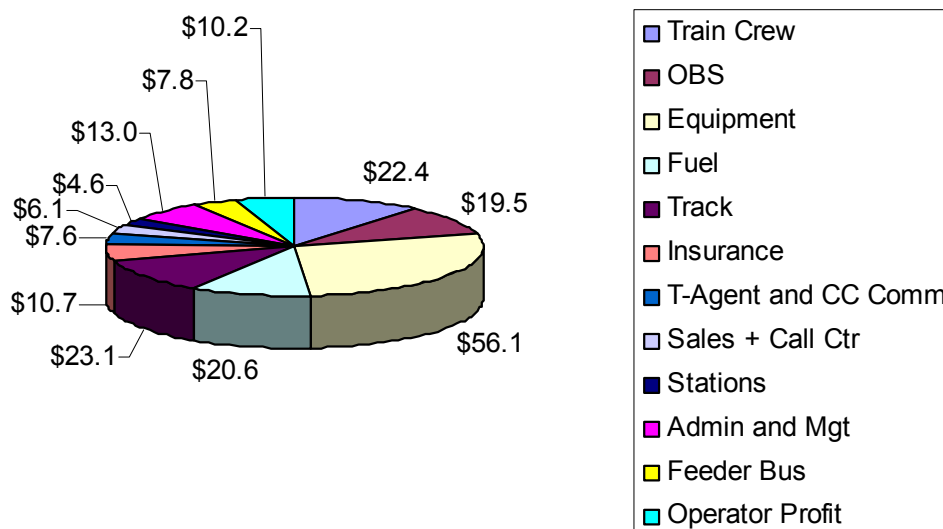
<b>Category</b>	<b>Basis</b>	<b>Type</b>	<b>MWRRS Benchmark</b>	<b>Ohio Hub High-Speed Scenarios</b>
Train Crew	Train Miles	Variable	\$3.95	Same as MWRRS
OBS	Train Miles + OBS Revenue	Variable	\$1.53 (crew and supervision) + 50% OBS Revenue	Same as MWRRS
Equipment Maintenance	Train Miles	Variable	\$9.87	Same as MWRRS
Energy/Fuel	Train miles	Variable	\$2.32	\$3.62
Track/ROW	Train Miles	Fixed	Lump sum (corridor wise - year wise) plus 39.5¢ /TM for out-of-pocket expense such as dispatching.	Same as MWRRS
Station Costs	Passenger	Fixed	\$26,093,119 per year (full operation)	\$4,613,892 per year (full operation)
Insurance	Passenger miles	Variable	\$0.011	Same as MWRRS
Sales/Mktg	Passenger + Ticket Revenue	Both Fixed and Variable	\$7,339,450 fixed (media and phone support) plus 57¢/Rdr variable	\$2,293,538 fixed (media and phone support) plus 57¢/Rdr variable
Admin	Train miles	Fixed	\$28,993,655 Fixed	\$8.9 Mill Fixed plus \$1.43 per TM
Bus Feeder	Bus-miles	Fixed	Lump sum (corridor wise – year wise)	Lump sum (corridor wise – year wise)
Operator's Profit	% of selected costs	Variable	10%	Same as MWRRS

Exhibit 6-14 gives a summary of the Unit Cost assumptions used for the 2007 Ohio Hub business plan update. Exhibits 6-15 and 6-16 give further detail on the forecasted financial performance of the routes for a fully built-out 110-mph system. It can be seen that the 3-C corridor incurs the heaviest operating expense, accounting for 27% of the Ohio system total.<sup>46</sup> The original four corridors generate 68% of the total cost with the three incremental corridors account for the remaining 32%. The largest single category of expense is for train equipment maintenance with 29%, followed by train crew (11%), fuel (10%), and on board services expense (10%). Operator profit is still set at 10% of variable costs under the operator's direct control<sup>47</sup>, which works out to a 5% margin overall.

**Exhibit 6-15: 2025 Operating Cost Detail by Corridor (\$2002 Mill, 2007 Update)**



**Exhibit 6-16: 2025 Operating Cost Detail by Expense Type (\$2002 Mill, 2007 Update)**



<sup>46</sup> The 3-C has 27% of total cost compared to 22% of the train-miles. However, 3-C would also generate more ridership related costs such as call center and credit card commissions, which would give it a higher share of the overall costs, because the 3-C would be the most heavily-traveled corridor on the system.

<sup>47</sup> Operator's costs exclude track and train equipment maintenance, which have their own profit margins already built-in.