

## 8. Implementation Plan

Given the scale of the Ohio and Lake Erie Regional Rail-Ohio Hub system, it is assumed that the implementation of the system will be accomplished in phases. One of the primary purposes of the Implementation Plan is to provide a framework for organizing and analyzing the cash flow in the financial analysis. It is expected that the Implementation Plan will evolve as the project advances into the detailed planning and engineering phase.

The timeframe takes the project through design and manufacture of rolling stock, project development, preliminary engineering, design and final construction of the rail system's infrastructure. Project development includes all environmental reviews and/or the steps necessary under the National Environmental Policy Act (NEPA), including public involvement and necessary engineering to obtain a *record of decision* under NEPA requirements. Such an approach allows the states to secure funding and to develop the infrastructure as needed.

The Implementation Plan has been refined so that a positive operating cash flow can be assured as early in the implementation schedule as possible. The corridors have been segmented and re-ordered in such a way as to optimize financial results. Thus, those corridors with the highest operating returns are implemented in earlier phases of the plan. The implementation plan has evolved as the study has progressed.

- Phasing proposed in the original 2004 study was very simple: starting with the 3-C Corridor in 2010, one completed route was to be added each year until the entire four-route system was operational by 2013.
- Therefore, an implementation plan has been developed for the 110-mph Ohio Hub system and the pro-forma financials presented here, as well as the cost benefit ratios presented at the end of the previous chapter all reflect the 110-mph assumption.
- The phasing plan proposed in the 2007 update recognizes the timing of planned MWRRS implementation. It interweaves implementation of three MWRRS corridors, with the original four Ohio Hub corridors and three new "Incremental" corridors that have been evaluated in this study. The phasing plan assumes each MWRRS route is implemented in the year that it is called for in the MWRRS plan. Accordingly, in some early years of the new Ohio Hub implementation plan, MWRRS connectivity is not yet fully in place.

A synergistic effect occurs as implementation of the Ohio Hub System moves from one phase to the next. Each phase provides a strong base upon which to support the next phase by strengthening and increasing the value of the passenger rail service in the region. To quickly reduce operating deficits associated with start-up, it is important to progress rapidly from phase to phase.

## 8.1 Ranking of Corridors – 2007 Update

An implementation plan was developed for integrating the new incremental corridors into the proposed MWRRS and Ohio Hub systems. To establish the rankings, a qualitative scoring system based on multiple criteria was used as shown in Exhibit 8-1 below. MWRRS corridors were not included in the qualitative ranking process, since it is assumed that MWRRS corridors will be implemented according to the plan that had been previously approved by the MWRRS Steering Committee. However, the suggested implementation sequencing for Ohio Hub could change if the MWRRS plan falls behind schedule.

Exhibit 8-1 – Route Segment Scoring

Corridor	Op Ratio	Cost	Constructability	Freight	Partnership	TOTAL
		Benefit		Capacity		
3-C	9	9	4	9	10	41
Cleveland-Detroit	8	5	2	10	7	32
Columbus-Chicago*	9	9	5	2	7	32
Cleveland-Pittsburgh	8	6	7	3	7	31
Toledo-Columbus-Pittsburgh	7	7	8	4	4	30
Cleveland-Buffalo-Toronto	5	2	5	7	1	20

\* This partnership scoring assumes that the MWRRS South-of-the-Lake is implemented as planned, in 2012.

### Scoring Criteria

Operating Ratio	0 - Less than 1.0 10 - Better than 1.5
Cost Benefit:	0 - Less than 1.0 10 - Better than 2.0
Constructability:	0 - All dedicated track on new ROW with new structures and bridges 10 - Upgrade existing track in place with very little new construction
Freight Copy:	0 - Adds no capacity or adds in a place where there is little/no demand 10 - Add another track to a freight line of heavy demand
Partnership:	1 - 3 Partners 4 - 2 Partners 7 - 1 Partner 10 - 0 Partners

The 3-C is financially the strongest Ohio Hub corridor because of its high ridership and revenue yield, so in the overall scoring, the 3-C line clearly emerged as the highest priority corridor for Ohio. After this, the qualitative scorings of all the remaining lines are very close, so they could be implemented in practically any order desired.

What emerged from this analysis is that complementary sets of lines focusing on either a “Cleveland Hub” or a “Columbus Hub” could be developed into a viable stand alone Ohio network, and Ohio could reasonably choose to build either network first. A “Columbus Hub” would probably be easier to build and have a lower capital cost, but a “Cleveland Hub” would serve more population and produce slightly better operating results.

Early development of the “Cleveland Hub” is more compatible with the MWRRS because of the shared line segment from Cleveland to Toledo. This suggests that if the MWRRS stays on schedule, then priority should be placed on developing the Cleveland Hub first. But if MWRRS falls behind schedule<sup>55</sup>, then a Columbus Hub may be easier to develop first. Since the 2007 update assumes that MWRRS will be developed as planned, development of the Cleveland hub is progressed ahead of the Columbus hub in this plan. This results in a sequencing of the Ohio Hub corridors, as shown in Exhibit 8-2:

**Exhibit 8-2: Proposed Implementation Sequencing**

1) 3-C	-	2010
2) Detroit via Metro Airport	-	2011
3) Columbus-Fort Wayne*	-	2012
4) Pittsburgh via Youngstown	-	2013
5) Toledo-Columbus-Pittsburgh	-	2014
6) Toronto via Buffalo	-	2015

\* Assuming implementation of MWRRS in 2012, would provide through service from Columbus-Chicago.

This proposed sequence and implementation years are consistent with both previous Ohio Hub and MWRRS efforts. As compared to the earlier Ohio Hub plan, the sequence of implementation of the original Ohio lines would remain the same, and the MWRRS lines still follow the schedule that was developed in the MWRRS plan. Assuming on-time implementation of the MWRRS plan, Columbus to Chicago connectivity via Fort Wayne would be added in 2012 ahead of construction of the Cleveland-Pittsburgh line; and Toledo-Columbus and Columbus-Pittsburgh services would both be added in 2014 ahead of the Buffalo line.

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<sup>55</sup> If MWRRS falls behind schedule, this would delay Ohio's ability to gain access to Chicago from both Cleveland and Columbus. This suggests that Ohio should continue to promote the development of the MWRRS and support the development of the South-of-the-Lake improvement; but unfortunately the ability to progress MWRRS depends also on the cooperation of other states, along with the freight railroads and the Federal government. Therefore, the ability to gain Chicago access is not entirely under Ohio's control but also requires the active participation and support of both Indiana, Illinois and Michigan.

If the MWRRS is not implemented on time, the Columbus-Fort Wayne segment would score lower because of added Partnership requirements for developing Chicago access. The priority for Toledo-Columbus-Pittsburgh may then move higher. If MWRRS fails to progress the South-of-the-Lake initiative, the added complexity of incorporating Chicago connectivity into the Ohio Hub rather than implementing it under the MWRRS program may result in its construction being delayed for a few years. However, Chicago connectivity is clearly very important to Ohio residents and needs to be built as part of one system or the other. The following describes the current proposed build-out plan for the Ohio Hub in more detail.

### 8.1.1 3-C Corridor -2010

The 3-C corridor scores very high on Cost Benefit and Operating Ratio criteria since it is a very well-performing route. While some segments of it follow heavily used rights-of-way, other segments use more lightly used freight lines. Because of the assumed mixture of dedicated and co-mingled segments along the 3-C, the corridor gets an intermediate score for constructability, but a very high score for adding capacity to freight lines in places where added capacity is needed. Finally, the 3-C gets a “10” the highest rating possible for partnership, since it is entirely an intrastate corridor and no partnerships with other states are required to develop the line. As shown in Exhibit 8-3, the 3-C would be implemented concurrently with planned MWRRS improvements to the Chicago-Detroit line.

Exhibit 8-3 – Year 2010



### 8.1.2 Cleveland-Detroit Corridor -2011

There are two ways to connect Detroit to Pittsburgh, via either Columbus or Cleveland. The scoring of these alternative is very close; however, since the Cleveland-Toledo segment is also needed as part of the MWRRS Cleveland-Chicago line, it is suggested that the Cleveland-Detroit via Detroit Metro Airport corridor be built next, in 2011.

As shown in Exhibit 8-4, Ohio's Cleveland to Detroit line would connect the 3-C corridor to the MWRRS Chicago-Detroit line, thereby permitting some Cleveland to Chicago through travel via Detroit. Because of the added network connectivity it provides at Detroit, a Cleveland-Detroit extension is slightly favored over Cleveland-Pittsburgh. If however Michigan fails to develop its MWRRS corridor on time, then the Cleveland-Pittsburgh line or even the Panhandle route could emerge as Ohio's next priority. A Cleveland-Detroit extension will be relatively expensive to construct because of its extensive use of dedicated track and the fact that it operates over at least three different railroads. On the other hand, Cleveland-Detroit does add a lot of track capacity in places that could be useful to the freight railroads. The partnership score is high since only one state partner is needed, but the urgency for building this corridor is heavily dependent on continued progress of the MWRRS initiative and Michigan DOT's support.

Exhibit 8-4: Year 2011



### 8.1.3 Columbus - Fort Wayne - Chicago Extension - 2012

The proposed Columbus- Fort Wayne- Chicago extension anticipates implementation of MWRRS South-of-the-Lake improvements by 2012. If the MWRRS is built on-time, only one state partner is needed to reach Fort Wayne and the constructability is relatively easy. A Columbus-Chicago extension scores very high on both Operating Ratio and Cost Benefit criteria, because of the strength of the Chicago market. As shown in Exhibit 8-5, adding a Columbus to Fort Wayne link in 2012 would implement direct Chicago service to Cincinnati, Cleveland, and Columbus all at the same time. In the MWRRS, Michigan branch lines would also come on-line in 2012 to utilize the added capacity provided when the South-of-the-Lake improvement opens. Rather than terminating Chicago-Columbus trains in downtown Columbus where there is no place to store them, these trains may be operated a little farther east to actually originate at the Port Columbus airport rather than at the downtown station.

If the South-of-the-Lake improvement is not implemented on time, a Chicago extension would become more difficult – comparatively, much more difficult than proceeding with the in-state Ohio corridors, because of the need to coordinate with three other states: Indiana, Michigan, and Illinois. Without the full cooperation of these other states to maintain a high priority on South-of-the-Lake implementation, Ohio would need to shift its attention to completing the development of its own in-state rail network. Nonetheless, for the current plan it is assumed that the Chicago lines are all implemented in 2012.

Exhibit 8-5: Year 2012



### 8.1.4 Cleveland-Pittsburgh Corridor - 2013

Like the Cleveland-Detroit line, the Pittsburgh extension would only require one state partner to work with. It is hard to predict the reaction of other State DOT's, but Pennsylvania DOT is known to strongly support the development of rail on its Keystone corridor between Philadelphia and Harrisburg. The Keystone corridor however, does not currently extend as far west as Pittsburgh. For this reason, development of this corridor has been initially prioritized lower than Cleveland-Detroit, but could change depending on the level of Penn DOT's interest.

As shown in Exhibit 8-6, the Cleveland-Pittsburgh via Youngstown line scores well on constructability and cost benefit criteria due to its extensive use of abandoned or lightly used freight rights of way; although there would still be some significant sections of dedicated track alongside heavily used freight line segments. The extension does well on Operating Ratio criteria as well, and would do even better with an eastern Keystone connection.

The freight capacity score for this line is relatively low since this project would develop an essentially dedicated passenger corridor on a separate right-of-way, and it is not clear that freight railroads would share much interest in using it.

Exhibit 8-6 – Year 2013



### 8.1.5 Toledo-Columbus-Pittsburgh “Incremental” Corridors - 2014

As shown in Exhibit 8-7, two separate line segments would both be implemented in the same year. These incremental corridors score well in terms of constructability, since they are lightly used lines and much of the Panhandle line is already owned by ORDC. However, the corridors do have some implementation challenges, particularly with the need for some grade separations at crossings with other rail lines, relocating bike trails on the Panhandle line, and for the need for urban terminal rail capacity mitigation.

The incremental corridors receive a moderate freight capacity score since the Panhandle upgrade may reopen a Pittsburgh-Columbus shortcut to a limited number of freight trains. This may prove valuable for adding eastern rail connectivity, such as from New York to the Rickenbacker logistics park. The proposed Panhandle line improvements may also include an optional service extension of some passenger trains from Newark to Zanesville, the feasibility of which has been proposed but not evaluated by this study.

The partnerships issue for both corridors requires the cooperation of two states. The Toledo to Detroit segment should already have been completed by this time, but cooperation of Michigan DOT will still be required to extend the proposed Columbus-Toledo trains through to Detroit.

Exhibit 8-7: Year 2014



### 8.1.6 Buffalo - Niagara Falls - Toronto Line Extension -2015

The proposed corridor extension to Toronto shown in Exhibit 8-8 has very promising potential, but the current plan still has several high-risk elements, particularly with respect to the proposed border crossing at Niagara Falls as well as the train's treatment once it gets into Canada. A partnership with three other state or provincial entities – one of them Canadian – as well as with the U.S. Homeland Security department and VIA Rail Canada would be required to make this project a success. For this reason, this segment has been prioritized lowest in the list.

If the Buffalo line could be fed by *both* Toronto and Empire Corridor connecting traffic, the forecast could be very strong. The corridor ridership projection for this line is currently rather weak and can only support five round trips per day. In view of this, the constructability and Cost Benefit aspects for the project are marginal because of the very extensive assumed use of dedicated track on the CSX alignment. However, addition of the proposed third track to the CSX corridor would add significant freight capacity to the corridor. Alternatively, by shifting the project to the NS line instead of CSX or by quantifying and including freight benefits, it is possible that the cost benefit ratio might be improved.

Exhibit 8-8: Year 2015



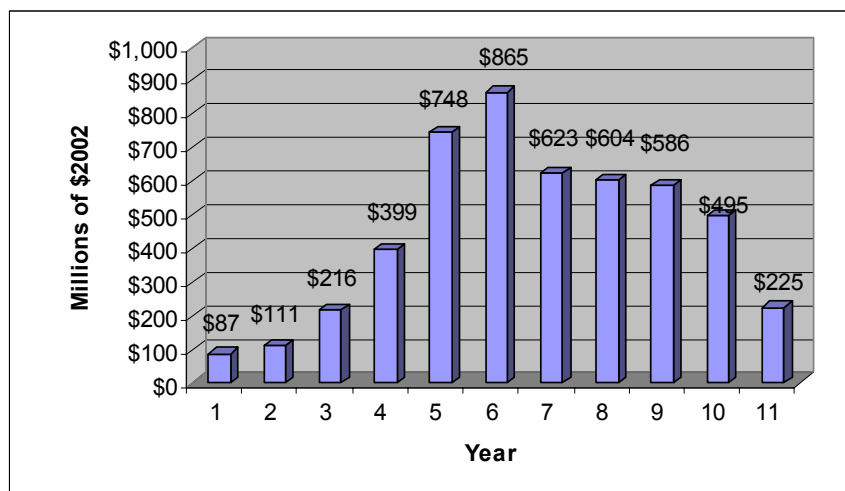
### 8.1.7 2007 Implementation Plan Summary

Exhibits 8-9 and 8-10 summarize the results of the revised implementation plan for the \$4.8 billion Ohio Hub system. Year 6 would be the year of the greatest expense since the 3-C, Cleveland-Detroit and Columbus-Fort Wayne lines would all be under construction at the same time. As shown in Exhibit 8-10, during that year a funding capability of \$850 million would have to be in place. It is anticipated that this can be obtained using a combination of direct State and Federal grants, plus financing for any amounts that exceed the Federal funding cap.

**Exhibit 8-9: Proposed 2007 Implementation Plan and Costs**

Ohio-Lake Erie Regional Rail	\$ 1000's of 2002S)	Year1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
3-C Corridor + Mtce Base	\$1,123,573		PE	Final Design		Construction		Operation					
Cleveland-Detroit	\$593,769	PI	PE	Final Design		Construction		Operation					
Columbus-Ft Wayne	\$494,712		PI	PE	Final Design		Construction		Operation				
Cleveland-Pittsburgh	\$484,968			PI	PE	Final Design		Construction		Operation			
Toledo-Columbus-Pittsburgh	\$693,396				PI	PE	Final Design		Construction		Operation		
Cleveland-Toronto	\$801,149					PI	PE	Final Design		Construction		Operation	
<b>Total Investment Costs by Year</b>		<b>Year1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Year 6</b>	<b>Year 7</b>	<b>Year 8</b>	<b>Year 9</b>	<b>Year 10</b>	<b>Year 11</b>	<b>Year 12</b>
Planning and Implementation (PI)	\$261,973	\$70,223	\$37,111	\$30,920	\$30,311	\$43,337	\$50,072						
Preliminary Engineering (PE)	\$366,762	\$16,385	\$74,201	\$58,237	\$44,590	\$45,616	\$59,204	\$56,846	\$11,683				
Final Design	\$419,157			\$56,179	\$85,867	\$54,424	\$48,984	\$58,918	\$74,727	\$40,057			
Construction	\$3,143,675				\$105,335	\$477,006	\$885,048	\$397,980	\$386,007	\$471,528	\$495,449	\$225,323	
Total Infrastructure	\$4,191,567	\$86,609	\$111,311	\$145,335	\$266,102	\$620,383	\$743,307	\$513,744	\$472,417	\$511,586	\$495,449	\$225,323	
Total Land	\$320,447			\$70,754	\$57,930	\$52,548	\$47,352	\$34,691	\$57,172				
Total Rolling Stock	\$447,500				\$74,584	\$74,584	\$74,583	\$74,583	\$74,583				
<b>Total Investment</b>	<b>\$4,959,514</b>	<b>\$86,609</b>	<b>\$111,311</b>	<b>\$216,089</b>	<b>\$398,616</b>	<b>\$747,515</b>	<b>\$865,242</b>	<b>\$623,018</b>	<b>\$604,172</b>	<b>\$586,169</b>	<b>\$495,449</b>	<b>\$225,323</b>	
Key to Implementation Stages:		Key to Operation Phases:											
Project Development		Phase 1			Phase 2			Phase 3			Phase 4		
Preliminary Engineering		Phase 5			Phase 6								
Final Design													
Construction													

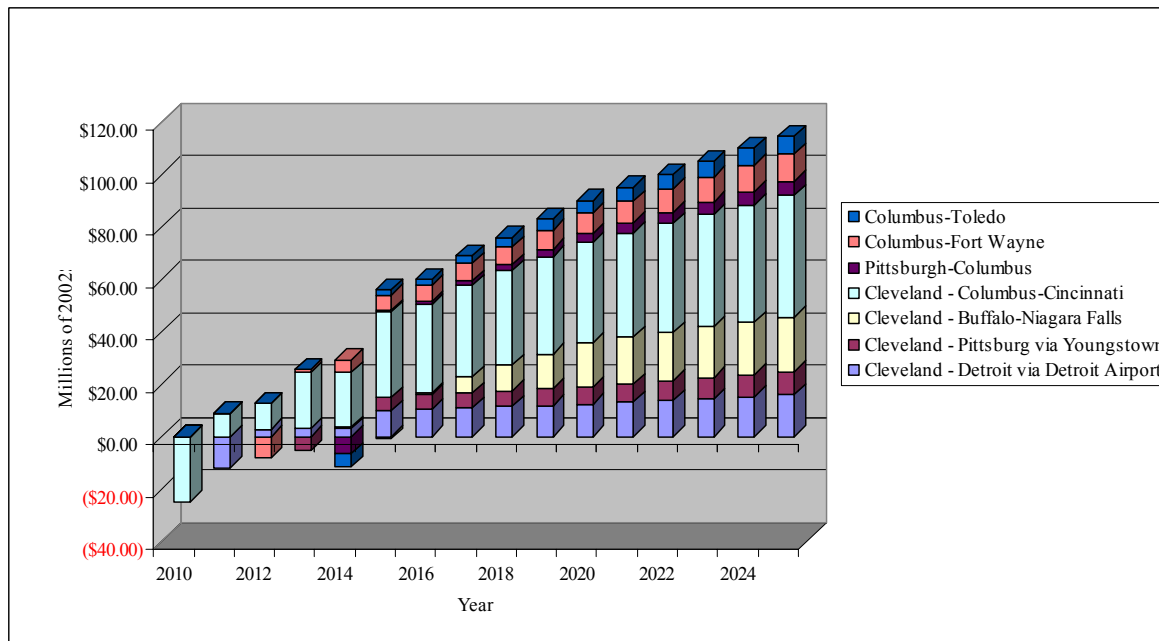
**Exhibit 8-10: Ohio Hub System Capital Requirement – Revised 2007 Plan**



## 8.2 Financial Results of the Implementation Plan

The 2007 Ohio Hub plan update resulted in an update to the model demographics, an upwards revision of the forecast for the Pittsburgh, Buffalo and Detroit corridors, the addition of three new corridors to the system, a joint reoptimization of the Ohio Hub and MWRRS Operating plans, and an updating of the operating cost assumptions as described in previous sections. These revisions resulted in a substantial improvement to the forecast financial results for the original four corridors, as well as the development of financial projections for the three added incremental corridors. Exhibit 8-11 shows the projected operating cash flow (surplus or subsidy requirement) by route.<sup>56</sup> Total revenues and operating expense projections for the seven-route Ohio Hub system for 2004 through 2040, and the resultant cash flow are presented in Exhibit 8-12.

**Exhibit 8-11: Corridor Level Operating Cash Flow (2007 Incremental Corridors Update)**



<sup>56</sup> As compared to Exhibit 8-5 from the 2004 study, it can be seen that *all* routes and not just the 3-C corridor are generating operating surpluses by 2015, although the 3-C corridor continues to be the strongest performer.

Exhibit 8-12: Ohio Hub Preliminary Operating Statement (2007 Incremental Corridors Update)

Thousands of 2002 \$	Total to 2040	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
<b>Revenues</b>											
Ticket Revenue	\$15,326,362	\$46,811	\$124,601	\$222,252	\$315,537	\$359,032	\$431,849	\$441,508	\$455,265	\$466,973	\$478,680
On Board Services	\$1,226,109	\$3,745	\$9,968	\$17,780	\$25,243	\$28,723	\$34,548	\$35,321	\$36,421	\$37,358	\$38,294
Express Parcel Service (Net Rev)	\$766,318	\$2,341	\$6,230	\$11,113	\$15,777	\$17,952	\$21,592	\$22,075	\$22,763	\$23,349	\$23,934
Bus Feeder	\$189,100	\$910	\$2,060	\$2,986	\$3,881	\$4,634	\$5,368	\$5,478	\$5,621	\$5,747	\$5,874
<i>Total Revenues</i>	<b>\$17,507,890</b>	\$53,806	\$142,859	\$254,131	\$360,437	\$410,341	\$493,357	\$504,383	\$520,070	\$533,426	\$546,783
<b>Train Operating Expenses</b>											
Energy and Fuel	\$1,215,846	\$8,792	\$15,841	\$31,112	\$35,220	\$39,413	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749
Train Equipment Maintenance	\$3,317,941	\$23,993	\$43,230	\$84,902	\$96,111	\$107,554	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929
Train Crew	\$1,324,487	\$9,578	\$17,257	\$33,892	\$38,367	\$42,935	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479
On Board Services	\$1,127,386	\$5,592	\$11,685	\$22,051	\$27,520	\$31,034	\$34,935	\$35,321	\$35,871	\$36,340	\$36,808
Service Administration	\$756,615	\$12,376	\$15,163	\$21,201	\$22,825	\$24,483	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406
Operating Profit	\$584,351	\$4,603	\$7,507	\$13,483	\$15,677	\$17,522	\$18,997	\$19,098	\$19,238	\$19,358	\$19,479
<i>Total Train Operating Expenses</i>	<b>\$8,326,626</b>	\$64,935	\$110,684	\$206,641	\$235,720	\$262,941	\$280,495	\$280,983	\$281,673	\$282,261	\$282,850
<b>Other Operating Expenses</b>											
Track & ROW Maintenance	\$1,320,893	\$10,913	\$18,300	\$34,302	\$37,551	\$41,945	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303
Station Costs	\$325,992	\$3,160	\$3,298	\$8,986	\$9,591	\$10,497	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172
Sales & Marketing	\$778,014	\$5,019	\$8,392	\$12,610	\$16,781	\$19,134	\$22,288	\$22,727	\$23,335	\$23,858	\$24,382
Insurance Liability	\$685,860	\$2,483	\$5,998	\$10,519	\$14,604	\$16,585	\$19,598	\$20,002	\$20,541	\$21,012	\$21,484
Bus Feeder	\$315,167	\$1,516	\$3,433	\$4,977	\$6,468	\$7,724	\$8,946	\$9,131	\$9,368	\$9,579	\$9,790
<i>Total Other Operating Expenses</i>	<b>\$3,425,925</b>	\$23,091	\$39,421	\$71,393	\$84,995	\$95,884	\$107,306	\$108,335	\$109,718	\$110,924	\$112,130
<b>Total Operating Expenses</b>	<b>\$11,752,552</b>	\$88,026	\$150,105	\$278,034	\$320,714	\$358,825	\$387,801	\$389,317	\$391,391	\$393,185	\$394,980
<b>Cash Flow From Operations</b>	<b>\$5,755,338</b>	(\$34,220)	(\$7,246)	(\$23,903)	\$39,723	\$51,516	\$105,555	\$115,065	\$128,679	\$140,241	\$151,803
<b>Operating Ratio</b>	<b>1.49</b>	0.61	0.95	0.91	1.12	1.14	1.27	1.30	1.33	1.36	1.38

Exhibit 8-12: Ohio Hub Preliminary Operating Statement, ctd. (2007 Incremental Corridors Update)

Thousands of 2002 \$	Total to 2040	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
<b>Revenues</b>											
Ticket Revenue	\$15,326,362	\$490,388	\$498,471	\$506,554	\$514,637	\$522,720	\$530,803	\$538,474	\$546,145	\$553,816	\$561,487
On Board Services	\$1,226,109	\$39,231	\$39,878	\$40,524	\$41,171	\$41,818	\$42,464	\$43,078	\$43,692	\$44,305	\$44,919
Express Parcel Service (Net Rev)	\$766,318	\$24,519	\$24,924	\$25,328	\$25,732	\$26,136	\$26,540	\$26,924	\$27,307	\$27,691	\$28,074
Bus Feeder	\$189,100	\$6,000	\$6,098	\$6,196	\$6,293	\$6,391	\$6,488	\$6,583	\$6,678	\$6,772	\$6,867
<i>Total Revenues</i>	<b>\$17,507,890</b>	\$560,139	\$569,370	\$578,602	\$587,833	\$597,064	\$606,295	\$615,058	\$623,822	\$632,585	\$641,348
<b>Train Operating Expenses</b>											
Energy and Fuel	\$1,215,846	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749
Train Equipment Maintenance	\$3,317,941	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929
Train Crew	\$1,324,487	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479
On Board Services	\$1,127,386	\$37,276	\$37,600	\$37,923	\$38,246	\$38,569	\$38,893	\$39,200	\$39,507	\$39,813	\$40,120
Service Administration	\$756,615	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406
Operating Profit	\$584,351	\$19,599	\$19,684	\$19,769	\$19,855	\$19,940	\$20,025	\$20,106	\$20,188	\$20,269	\$20,350
<i>Total Train Operating Expenses</i>	<b>\$8,326,626</b>	\$283,438	\$283,847	\$284,255	\$284,664	\$285,073	\$285,481	\$285,869	\$286,257	\$286,646	\$287,034
<b>Other Operating Expenses</b>											
Track & ROW Maintenance	\$1,320,893	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303
Station Costs	\$325,992	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172
Sales & Marketing	\$778,014	\$24,906	\$25,272	\$25,638	\$26,005	\$26,371	\$26,738	\$27,086	\$27,435	\$27,784	\$28,133
Insurance Liability	\$685,860	\$21,955	\$22,302	\$22,649	\$22,996	\$23,342	\$23,689	\$24,016	\$24,343	\$24,669	\$24,996
Bus Feeder	\$315,167	\$10,001	\$10,163	\$10,326	\$10,489	\$10,651	\$10,814	\$10,972	\$11,130	\$11,287	\$11,445
<i>Total Other Operating Expenses</i>	<b>\$3,425,925</b>	\$113,336	\$114,212	\$115,088	\$115,964	\$116,840	\$117,716	\$118,549	\$119,382	\$120,216	\$121,049
<b>Total Operating Expenses</b>	<b>\$11,752,552</b>	\$396,775	\$398,059	\$399,344	\$400,628	\$401,912	\$403,197	\$404,418	\$405,640	\$406,861	\$408,083
<b>Cash Flow From Operations</b>	<b>\$5,755,338</b>	\$163,364	\$171,311	\$179,258	\$187,205	\$195,152	\$203,099	\$210,640	\$218,182	\$225,723	\$233,265
<b>Operating Ratio</b>	<b>1.49</b>	1.41	1.43	1.45	1.47	1.49	1.50	1.52	1.54	1.55	1.57

Exhibit 8-12: Ohio Hub Preliminary Operating Statement, ctd. (2007 Incremental Corridors Update)

Thousands of 2002 \$	Total to 2040	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
<b>Revenues</b>												
Ticket Revenue	\$15,326,362	\$569,158	\$577,429	\$585,700	\$593,971	\$602,242	\$610,513	\$619,098	\$627,684	\$636,269	\$644,855	\$653,441
On Board Services	\$1,226,109	\$45,533	\$46,194	\$46,856	\$47,518	\$48,179	\$48,841	\$49,528	\$50,215	\$50,902	\$51,588	\$52,275
Express Parcel Service (Net Rev)	\$766,318	\$28,458	\$28,871	\$29,285	\$29,699	\$30,112	\$30,526	\$30,955	\$31,384	\$31,813	\$32,243	\$32,672
Bus Feeder	\$189,100	\$6,962	\$7,063	\$7,164	\$7,264	\$7,365	\$7,466	\$7,570	\$7,674	\$7,778	\$7,882	\$7,986
<i>Total Revenues</i>	<b>\$17,507,890</b>	\$650,111	\$659,558	\$669,005	\$678,452	\$687,898	\$697,345	\$707,151	\$716,957	\$726,763	\$736,568	\$746,374
<b>Train Operating Expenses</b>												
Energy and Fuel	\$1,215,846	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749	\$41,749
Train Equipment Maintenance	\$3,317,941	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929	\$113,929
Train Crew	\$1,324,487	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479	\$45,479
On Board Services	\$1,127,386	\$40,427	\$40,758	\$41,089	\$41,420	\$41,750	\$42,081	\$42,425	\$42,768	\$43,111	\$43,455	\$43,798
Service Administration	\$756,615	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406	\$25,406
Operating Profit	\$584,351	\$20,432	\$20,519	\$20,607	\$20,694	\$20,781	\$20,869	\$20,959	\$21,050	\$21,140	\$21,231	\$21,321
<i>Total Train Operating Expenses</i>	<b>\$8,326,626</b>	\$287,422	\$287,840	\$288,259	\$288,677	\$289,095	\$289,513	\$289,947	\$290,381	\$290,815	\$291,249	\$291,683
<b>Other Operating Expenses</b>												
Track & ROW Maintenance	\$1,320,893	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303	\$45,303
Station Costs	\$325,992	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172	\$11,172
Sales & Marketing	\$778,014	\$28,482	\$28,857	\$29,232	\$29,607	\$29,982	\$30,357	\$30,745	\$31,133	\$31,521	\$31,909	\$32,297
Insurance Liability	\$685,860	\$25,323	\$25,675	\$26,027	\$26,379	\$26,732	\$27,084	\$27,446	\$27,809	\$28,171	\$28,534	\$28,896
Bus Feeder	\$315,167	\$11,603	\$11,771	\$11,939	\$12,107	\$12,275	\$12,444	\$12,617	\$12,790	\$12,964	\$13,137	\$13,310
<i>Total Other Operating Expenses</i>	<b>\$3,425,925</b>	\$121,882	\$122,778	\$123,673	\$124,568	\$125,463	\$126,359	\$127,283	\$128,206	\$129,130	\$130,054	\$130,978
<b>Total Operating Expenses</b>	<b>\$11,752,552</b>	\$409,305	\$410,618	\$411,931	\$413,245	\$414,558	\$415,872	\$417,230	\$418,587	\$419,945	\$421,303	\$422,661
<b>Cash Flow From Operations</b>	<b>\$5,755,338</b>	\$240,806	\$248,940	\$257,073	\$265,207	\$273,340	\$281,473	\$289,921	\$298,369	\$306,817	\$315,265	\$323,713
<b>Operating Ratio</b>	<b>1.49</b>	1.59	1.61	1.62	1.64	1.66	1.68	1.69	1.71	1.73	1.75	1.77

### 8.3 Cost Benefit Ratios – Ohio Hub Formal Recalculation

Exhibit 8-13 reports the results of a formal recalculation of the Ohio Hub cost benefit ratio, based on the implementation plan described in this Chapter. However, unlike the three-layer analysis, this formal recalculation includes only Ohio Hub’s own direct capital and operating costs, revenue, consumer surplus and environmental benefits. It does not include connecting revenue, consumer surplus or environmental benefits that accrue on the MWRRS lines, and for this reason the results are more conservative. The formal recalculation differs from the Three-Layer analysis in the following additional ways:

- Ohio Hub capital costs are somewhat higher, since in the formal recalculation, the Toledo-Cleveland capital cost is now considered part of the Ohio Hub, whereas in the Three Layer analysis, Toledo-Cleveland was considered part of Layer 1, and its cost was attributed to the MWRRS network.
- Only direct Ohio Hub operating costs and revenues are reflected in the analysis; the collateral impact on MWRRS connecting revenues and costs are not included. Therefore the revenues, operating costs, consumer surplus and environmental benefits are all somewhat lower here, than they were in the Three-Layer analysis.

The result of this recalculation, as shown in Exhibit 8-13, is a still-healthy 1.56 Benefits to Cost ratio. Although not as strong as the +2.00 ratios that include connecting MWRRS benefits, the new ratios are still very robust. Even so, the Benefit to Cost ratios resulting from the formal recalculation are stronger than those obtained in the earlier 2004 study. This improvement reflects the strengthened demand forecast in the Detroit, Pittsburgh and Buffalo corridors, as well as joint MWRRS-Ohio Hub operating plan optimization over the shared line segments.

**Exhibit 8-13: Ohio Hub Benefits and Cost – Formal Recalculation based on Implementation Plan  
(Lifecycle Present Values in Millions of 2002\$, 30 years at 3.9%)**

	<b>Ohio Hub Impl Plan</b>
Revenue	\$3,773
Consumer Surplus	\$3,094
Other Mode + Resource	\$3,524
<b>Total Benefit</b>	<b>\$10,391</b>
Capital Cost	\$3,999
Operating Cost	\$2,528
Track Capital Maintenance	\$126
<b>Total Cost</b>	<b>\$6,653</b>
<b>Cost/Benefit Ratio</b>	<b>1.56</b>

## 8.4 Project Financing

The 2004 financial model for the Ohio Hub System was updated to evaluate possible sources of funds and net cash flow projections for the system, with the addition of the three incremental corridors. Following Government Accounting Office (GAO) requirements, this analysis was done in real term values without considering inflation. All operating revenues or operating costs are in constant 2002 dollars.

### Sources and Uses of Funds

As shown in Exhibit 8-14, a model was developed to examine the projected cash flows of the project based on the phasing incorporated in the implementation schedule and on the projected financing requirements.

**Exhibit 8-14: Results of Financial Analysis – Sources and Uses of Funds (2007 Ohio Hub Plan)**

Sources and Uses of Funds (2004-2015)	Total (2004-2015)
<b>Sources of Funds</b>	
Short-term loan/GANS	\$529.7
Initial Working Capital Contribution	\$30.0
TIFIA Loans for Ramp-up Operating Losses	\$65.4
TIFIA Loans for Accrued Interest/Issuance Fees on GANS	\$81.5
Total TIFIA Funds	\$176.9
Federal Government Contribution	\$3,967.6
State Contribution	\$991.9
<b>Total Sources of Funds</b>	<b>\$5,666.1</b>
<b>Uses of Funds</b>	
Infrastructure Costs (Including P&E)	\$4,191.6
Land costs	\$320.4
Rolling Stock Costs	\$447.5
Total Capital Costs	\$4,959.5
TIFIA Uses of Funds:	
Start-up Costs	\$30.0
Ramp-up Operating Costs	\$65.4
Accrued Interest on GANS	\$80.5
GAN Issuance Fees	\$1.0
Total TIFIA Funds Uses	\$176.9
Repayment of GANS	\$529.7
<b>Total Uses of Funds</b>	<b>\$5,666.1</b>

In this scenario, state bonds are combined with TIFIA assistance and financing to meet the annual capital cost for infrastructure and rolling stock during the project’s implementation period. An initial start-up cost of \$30 million was assumed for this phase of the Ohio Hub Study to cover initial working capital requirements. With a federal funding ceiling set at \$400 million a year, the project would need to borrow \$529.7 million, with a participating state contribution of \$991.9 million. Detailed sources and uses of funds are provided in the Appendices.

## Net Cash Flow

Using the results of operating cash flows and source and uses of funds, Exhibit 8-15 summarizes and projects the net cash flow for the proposed Ohio Hub System.

**Exhibit 8-15: Results of Financial Analysis – Net Cash Flow Projections (2007 Ohio Hub Plan)**

Cash Flow Analysis (Thousands of 2002\$)	Total (2004 - 2040)
<b>Sources of Cash:</b>	
Operating Cash Flow	\$5,755,338
Tifia Loan for Ramp-Up Operating Losses	\$65,369
Interest Income on Working Capital Fund (2%)	<u>\$5,509</u>
<b>Gross Cash Flow From Operations</b>	<b>\$5,826,216</b>
<b>Applications of Cash:</b>	
Capital MofW Financing by Ohio Hub	(\$362,872)
Contribution to Working Fund (5%)	<u>(\$275,442)</u>
<i>Net Cash Flow before Debt Service</i>	<b>\$5,187,901</b>
<b>Change in Cash Balance (Proforma):</b>	
Beginning Cash Balance	\$0
Increase/(Decrease) in Cash	\$5,187,901
Ending Cash Balance	<u>\$5,187,901</u>
<i>Net Cash Flow before TIFIA Debt Service</i>	<b>\$5,187,901</b>
<b>TIFIA loans Outstanding:</b>	
Beginning Balance	
Ramp-up Operating Loss	(\$65,403)
Working Capital Deposit	(\$30,000)
GANs Interest / Issuance Fees	(\$67,753)
Accrued Interest on TIFIA	(\$35,991)
<i>Net Cash Flow After TIFIA Debt Re-payment</i>	<b>\$4,988,754</b>

The 30-year net cash flow of the Ohio Hub System, after capital Maintenance-of-Way requirements and TIFIA debt repayment, is projected to be \$4.98 billion (not an NPV). This improved cash flow reflects the improvement to the demand forecast for the original Ohio Hub routes as well as addition of three more routes to the system. A detailed cash flow pro forma analysis for the Ohio Hub System is provided in the Appendices.