

OHIO HUB PASSENGER RAIL SYSTEM



TEMS

Transportation Economics & Management Systems, Inc.

Agenda

- Why Ohio Hub
- Initial System Corridors
- FRA Viability Criteria
- Results for Initial System
- Incremental Corridors
- Results for Incremental Corridors
- Implementation
- Economic Impact
- Conclusions

Why the Ohio Hub System

- Limitations in Current Intercity Transportation System
 - Congested highway systems in major metropolitan areas make serving intercity markets difficult
 - Regional and short-haul air service is in jeopardy
 - Decline in intercity bus services since early 1980s
 - Minimal and unreliable existing passenger rail service.

Why the Ohio Hub System – (continued)

- Changing Demand Structure
 - Increased demand for regional and intercity transportation between regional centers, urban and rural areas due to growth of “New Economy”
 - New High Tech and Service Industries seek quality of life locations (i.e., small towns).

Why the Ohio Hub System – (continued)

- Regional Rail Potential
 - Rail rights of way exist and lead into downtown centers
 - New technology is highly cost effective
 - Regional system synergies produce economies of scale
 - Rail provides connectivity to small, urban, and regional centers
 - Regional rail hub and spoke system increases market potential and commuter connectivity through Cleveland, Columbus and Toledo.

Project Objective

- Evaluate the potential for a regional rail system that:
 - Preserves, improves, and expands the Ohio and Lake Erie regional transportation service
 - Meets policy and financial goals of all sponsors
 - Creates appealing “transportation products” that the public will pay for and use
 - Is financially and economically sound, without operating subsidies
 - Follows an incremental approach that is affordable to states.

Current Proposals to Improve Passenger Rail Services



Proposed Ohio Hub System



FRA Financial Requirements

- The 1997 Commercial Feasibility Study describes two conditions that are essential for receiving Federal funding support for proposed intercity passenger rail projects:
 - A cost-benefit ratio greater than 1.0, and
 - An operating cost ratio of at least 1.0, defined as a precondition for an effective public/private partnership.

The Ohio Hub System



Scenario Definition

- Option 1
 - Detroit via Detroit Airport / Cleveland-Youngstown-Pittsburgh
- Option 2
 - Detroit via Wyandotte / Cleveland-Alliance-Pittsburgh
- Option 3
 - Detroit via Wyandotte / Cleveland-Youngstown-Pittsburgh
- Option 4
 - Detroit via Detroit Airport / Cleveland-Alliance-Pittsburgh

Representative Equipment

Loco-Hauled
Bi-level Coaches



Modern
79-mph

DMU



Talgo T-21



High-Speed
110-mph

Pendolino



2025 Ridership & Revenue (\$2002 Millions)

Corridors	79-mph				110-mph			
	Option 1	Option 2	Option 3	Option 4	Option 1	Option 2	Option 3	Option 4
Ridership	2.49	2.00	2.11	2.40	3.24	2.74	2.76	3.13
Revenue	113.12	106.06	107.27	108.22	152.28	145.2	143.98	145.97



Operating Cost Detail by Corridor

	Option 1	Option 2	Option 3	Option 4
Train Miles	3.76	3.72	3.73	3.76
Total Cost*	\$126.63	\$122.22	\$123.33	\$123.46
Average Cost Per Train Mile	\$33.67	\$32.85	\$33.06	\$32.84

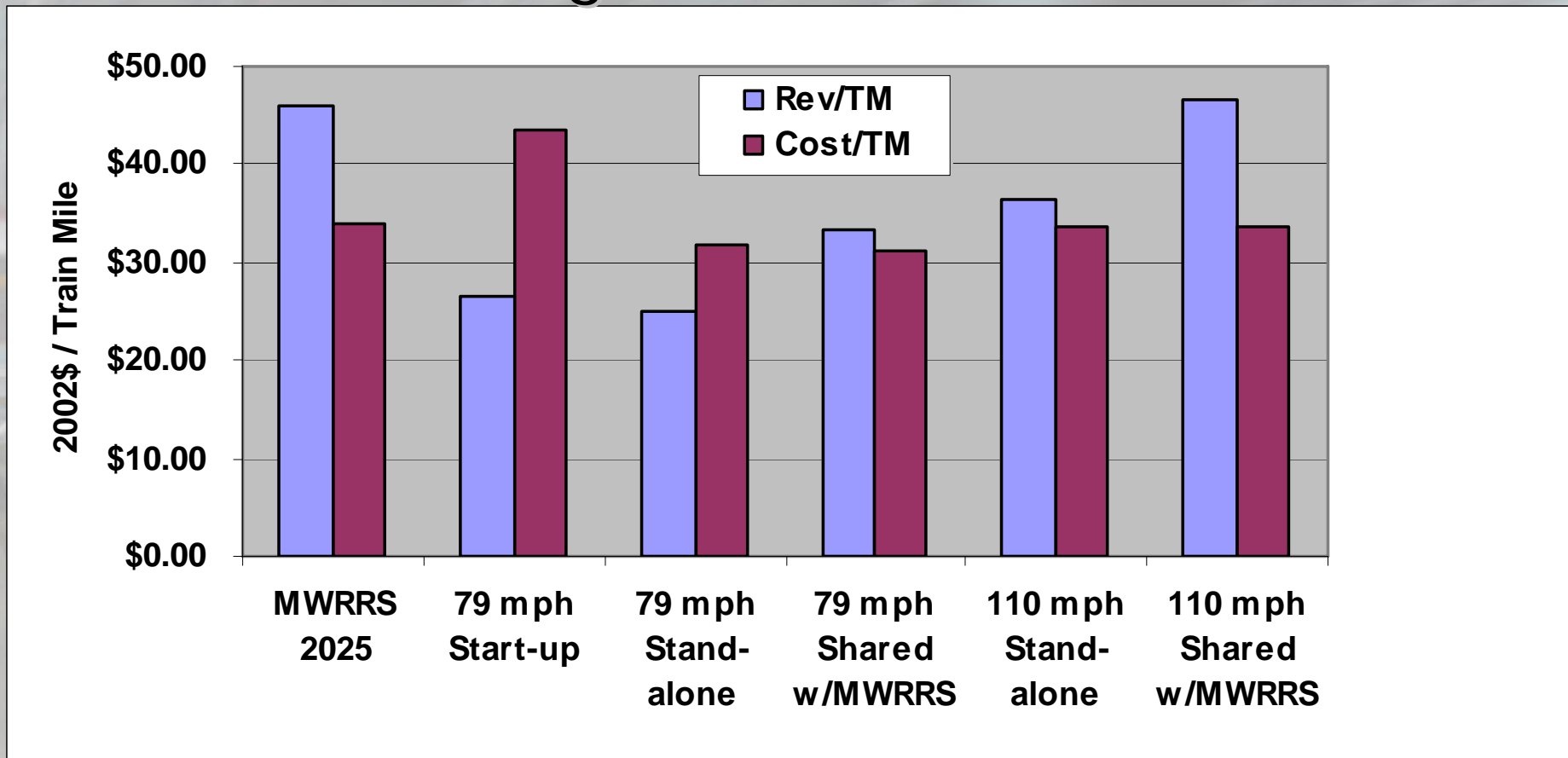
*\$2002 Millions

2025 Operating Ratio

Modern Scenario 79-mph		High Speed Scenario 110-mph	
Stand Alone Option 1	With MWRRI Option 1	Stand Alone Option 1	With MWRRI Option 1
0.79	1.01	1.10	1.39

2025 Cost and Revenue per Train Mile

For Option 1 – Detroit Airport –
Youngstown Alternative



Capital Investment Requirement by Corridor (\$2002 Millions)

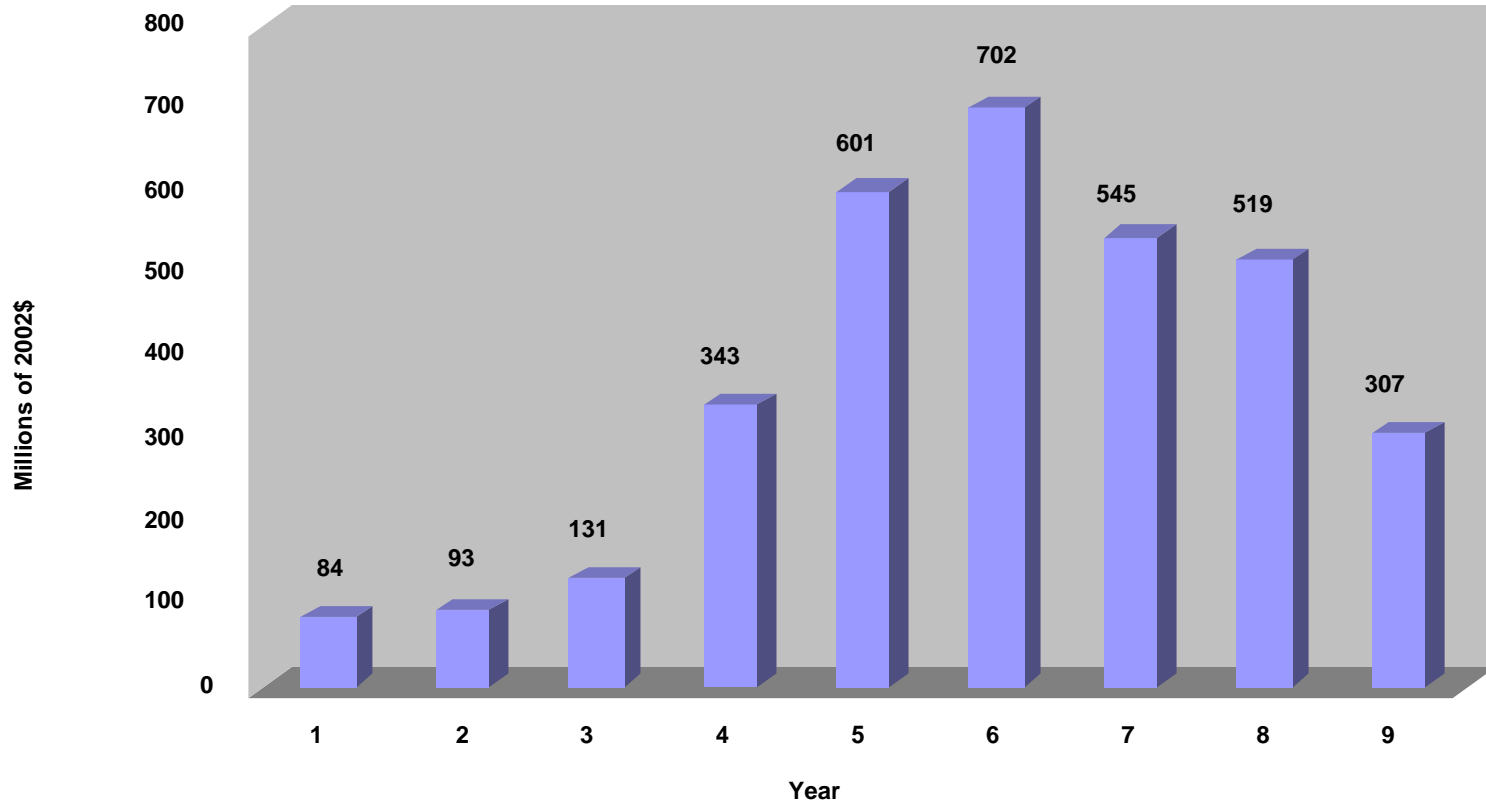
Option 1

	Cleveland-Columbus-Cincinnati Corridor	Cleveland-Detroit via Detroit Airport Corridor	Cleveland-Pittsburgh via Youngstown Corridor	Cleveland-Buffalo-Toronto Corridor
Start-up Year	2010	2011	2012	2013
Infrastructure	\$1,161.6	\$445.0	\$535.0	\$841.2
Rolling Stock	\$80.5	\$80.5	\$80.5	\$80.5
Total Capital Cost	\$1,242.1	\$525.5	\$615.5	\$941.7

Note: Total infrastructure cost includes Planning, Engineering & Design, Construction and Land costs

Capital Requirements

Option 1



Year 1 estimated to be 2004 based on implementation plan

Total: \$3.32 billion

Proposed Implementation Plan and Costs

Ohio-Cleveland Hub	\$ 1000's of 2002\$)	Year1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
3-C Corridor	\$1,090,801		PE	Final Design		Construction		Operation			
Cleveland-Detroit	\$387,101	PI	PE	Final Design		Construction		Operation			
Cleveland-Pittsburgh	\$487,624		PI	PE		Final Design		Construction		Operation	
Cleveland-Toronto	\$803,996			PI	PE	Final Design		Construction		Operation	
Total Investment Costs by Year		Year1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Planning and Implementation (PI)	\$173,095	\$68,175	\$24,194	\$30,477	\$50,250						
Preliminary Engineering (PE)	\$242,333	\$15,908	\$69,275	\$45,600	\$45,815	\$54,011	\$11,725				
Final Design	\$276,952			\$54,540	\$73,895	\$43,736	\$64,581	\$40,200			
Construction	\$2,077,142				\$102,263	\$445,341	\$497,665	\$367,106	\$438,643	\$226,124	
Total Infrastructure	\$2,769,522	\$84,083	\$93,469	\$130,616	\$272,222	\$543,088	\$573,971	\$407,306	\$438,643	\$226,124	
Total Land	\$233,209				\$70,756	\$57,930	\$47,351	\$57,172			
Total Rolling Stock	\$322,000						\$80,500	\$80,500	\$80,500	\$80,500	
Total Investment	\$3,324,731	\$84,083	\$93,469	\$130,616	\$342,978	\$601,018	\$701,822	\$544,977	\$519,143	\$306,624	
Key to Implementation Stages											
Project Development											
Preliminary Engineering											
Final Design											
Construction											
Key to Operation Phases:											
Phase 1											
Phase 2											
Phase 3											
Phase 4											

Use these numbers for Fin Plan

Benefits and Costs of All Options – High-Speed Scenario with MWRRS Connectivity -

Lifecycle Present Values (\$2002 Millions)

	Option 1	Option 2	Option 3	Option 4
Net Present Value (NPV)	\$1,040	\$805	\$326	\$722
Benefit/Cost Ratio	1.24	1.18	1.08	1.17

Note:

Option 1: Detroit Airport—Youngstown Alternative

Option 2: Wyandotte—Alliance Alternative

Option 3: Wyandotte—Youngstown Alternative

Option 4: Detroit Airport—Alliance Alternative

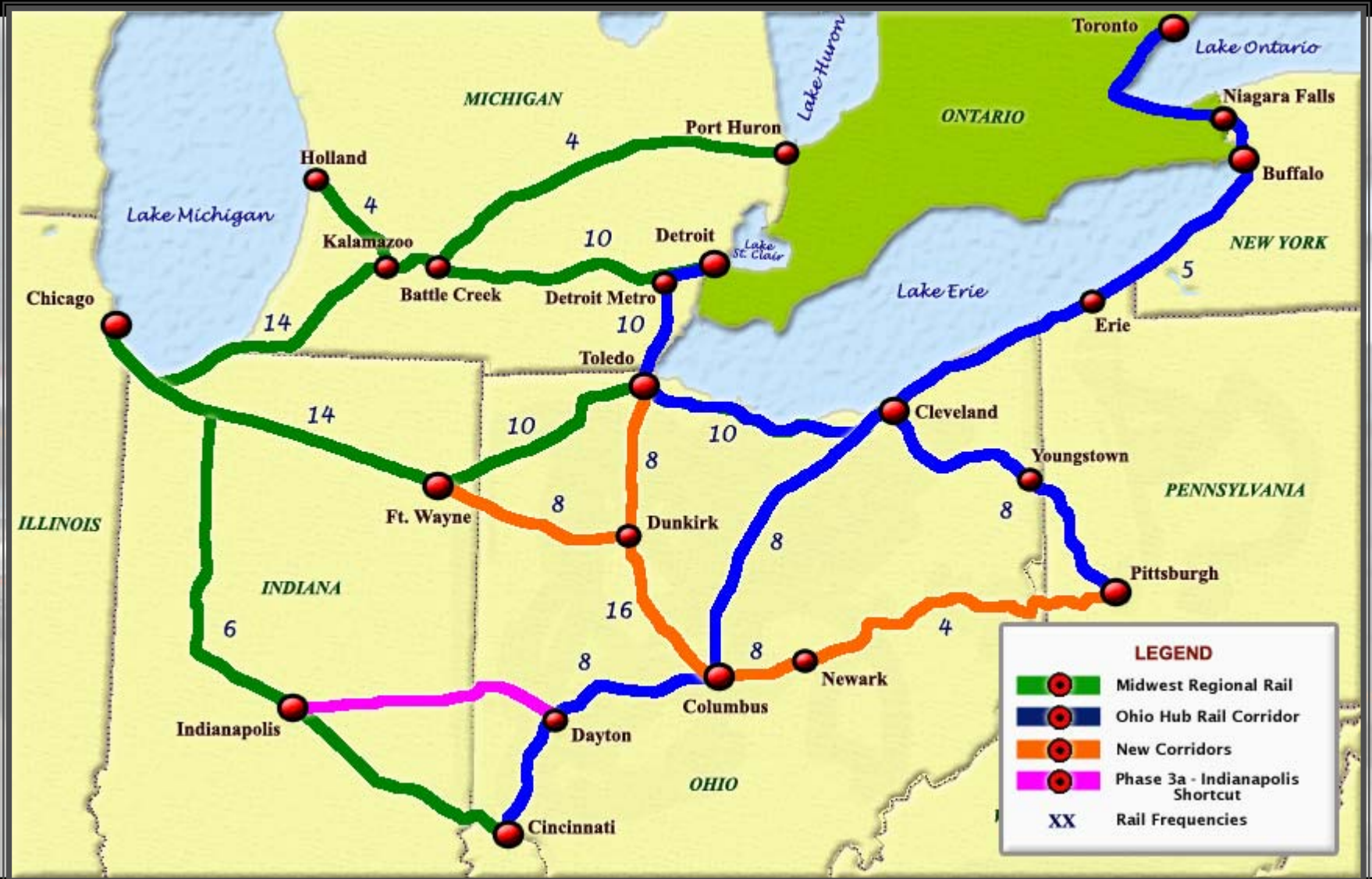
Community Economic Benefits Summary for the Cleveland Hub System

Potential Employment Increase (# of New Jobs)	Average Annual Household Income Increase	Aggregate Property Value Increase (millions of 2002\$)
14,000-30,000	\$120 - \$610	\$3,000 - \$23,000

MWRRI and Ohio Hub – Original Routes



Ohio Hub Incremental Routes



Incremental Corridors Financial Performance

Ohio Incremental Corridors - 2025

Corridor	Revenue	Cost	Surplus	Op Ratio
Cleveland-Cincinnati	\$109	\$52	\$57	2.09
Cleveland-Detroit	\$54	\$38	\$17	1.45
Cleveland-Niagara Falls	\$48	\$25	\$23	1.94
Cleveland-Pittsburgh	\$32	\$21	\$11	1.51
Subtotal OHIO Base	\$244	\$136	\$108	1.80
Pittsburgh-Columbus	\$25	\$19	\$6	1.30
Columbus-Ft Wayne	\$38	\$26	\$12	1.46
Columbus-Toledo	\$25	\$18	\$8	1.44
Subtotal OHIO Incremental	\$88	\$63	\$26	1.41
TOTAL	\$342	\$199	\$134	1.60

Capital Cost

Ohio Hub-Basic System	
Cleveland-Pittsburgh	\$535.0
Toledo-Detroit	\$152.0
Cleveland-Niagara Falls	\$724.0
3C-Corridor	\$1,166.0
14 Trains @ 17.9 mill	\$251.0
Total	\$2,828.0
Ohio Hub-Incremental Corridors	
Pittsburgh-Columbus	\$384.0
Columbus-Ft. Wayne	\$445.0
Dunkirk-Toledo	\$164.0
11 Trains @ 17.9 mill	\$197.0
Total	\$1,190.0

**Full System
Total Capital Costs
\$4,018.0 Million**

Implementation Plan

Route Segment Scoring

Corridor	Op Ratio	Cost Benefit	Construc- tability	Freight Capacity	Partnership	Total Score
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.

Cost Benefit Analysis

Cost-Benefit Analysis for Ohio Hub Implementation

in \$2002 dollars, discounted over 30-years at 3.9% with 3-year implementation period

Incremental Cost Benefits		
	OHIO Base	OHIO Incom
Revenue	\$3,141	\$1,214
Consumer Surplus	\$2,048	\$1,523
Other Mode + Resource	\$2,663	\$1,405
Total Benefit	\$7,852	\$4,142
Capital Cost	\$2,202	\$943
Operating Cost	\$1,653	\$977
Track Capital Maintenance	\$83	\$49
Total Cost	\$3,937	\$1,969
Cost/Benefit Ratio	1.99	2.10

Overall Economic Rent Results*

Ohio Hub Basic System

	MWRRI	Ohio Hub	Total
Employment	58,260	16,720	74,980
Household Income (ml)	1,208	1,077	2,285
Property Value (ml)	5,400	3,103	8,503

*Results on income and property value are given in 2005 USD

Columbus, Ohio



**Joint Development
\$245-335 Million**

Ashtabula, Ohio

Joint Development
\$50 Million



Hamilton, Ohio

Joint Development
\$60 Million



Toledo, Ohio



**Joint Development
\$100 Million**



Conclusions

- All corridors can meet FRA criteria:
 - Positive Operating Ratio
 - Positive Cost Benefit Ratio
- Because of administrative overhead a minimum network size is need to reduce per-train-mile operating costs enough to attain positive operating ratios
 - Adding Incremental routes improves Ohio Hub performance
- Because of the strength of Ohio corridors, alternative implementation strategies may also be viable
 - 3-C is an obvious candidate for early implementation; it may stand on its own, but to obtain Positive Operating Ratio it might need to be combined with at least one additional corridor for better economies of scale.

Recommendations

- Move forward with system PEIS
- Identify the community benefits of the project to the cities and towns of the region to support public outreach
- Evaluate route options as part of alternatives analysis
- Develop a funding program with federal, state and local participation
- Work with the freight railroads to identify potential partnership opportunities.

A high-speed train, likely a Shinkansen, is shown in motion, blurred background, with the text "Thank You." overlaid in the center. The train is white with an orange stripe and is moving towards the right. The background is a blurred tunnel or station.

Thank You.