Northern Indiana – Northwest Ohio Passenger Rail Routing Study

Final Steering Committee Meeting

Ft. Wayne, Indiana
November 21, 2002

Indiana Department of Transportation
Ohio Rail Development Commission
The National Passenger Rail Corporation (Amtrak)

Prepared by
Transportation Economics & Management Systems, Inc.

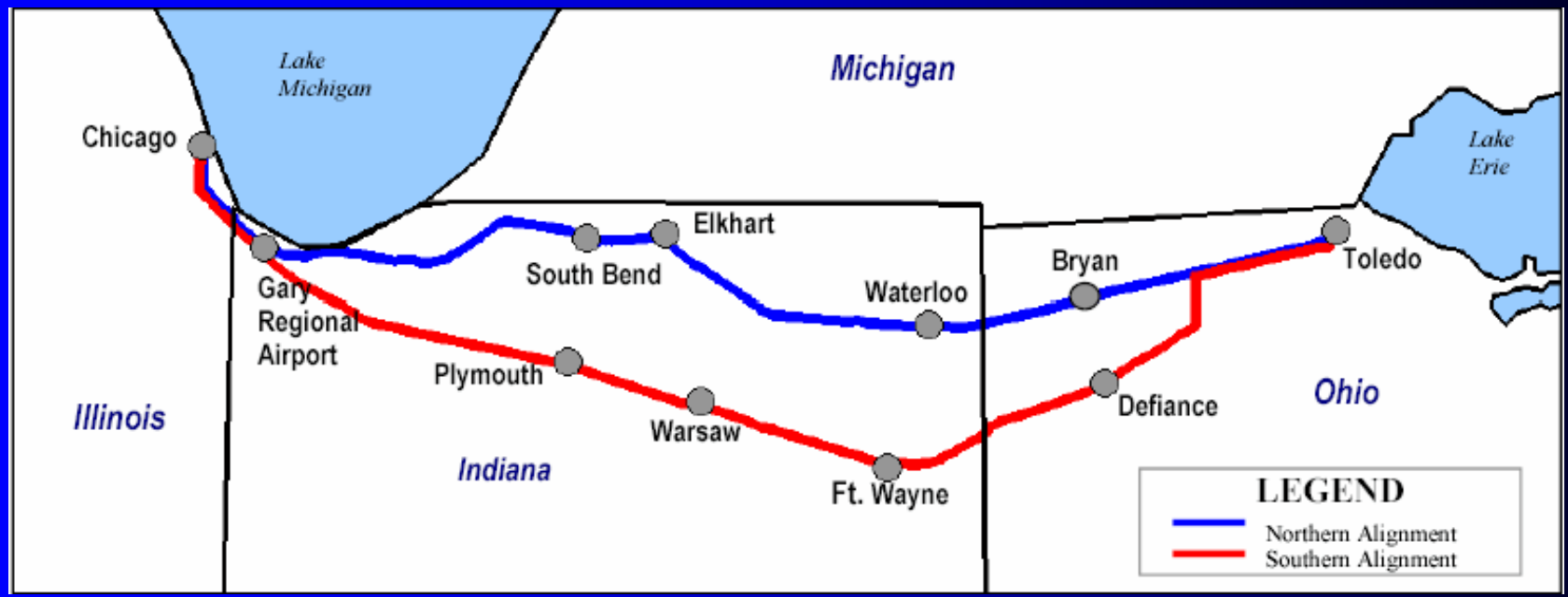
Outline of Presentation

- Definition of Alternative Scenarios
  - Northern Route
  - Southern Route
  - Southern Route with Express NICTD
- Proposed Operating Plans
- Ridership and Revenue Analysis
- Financial and Economic Analysis
- Conclusions and Recommendations

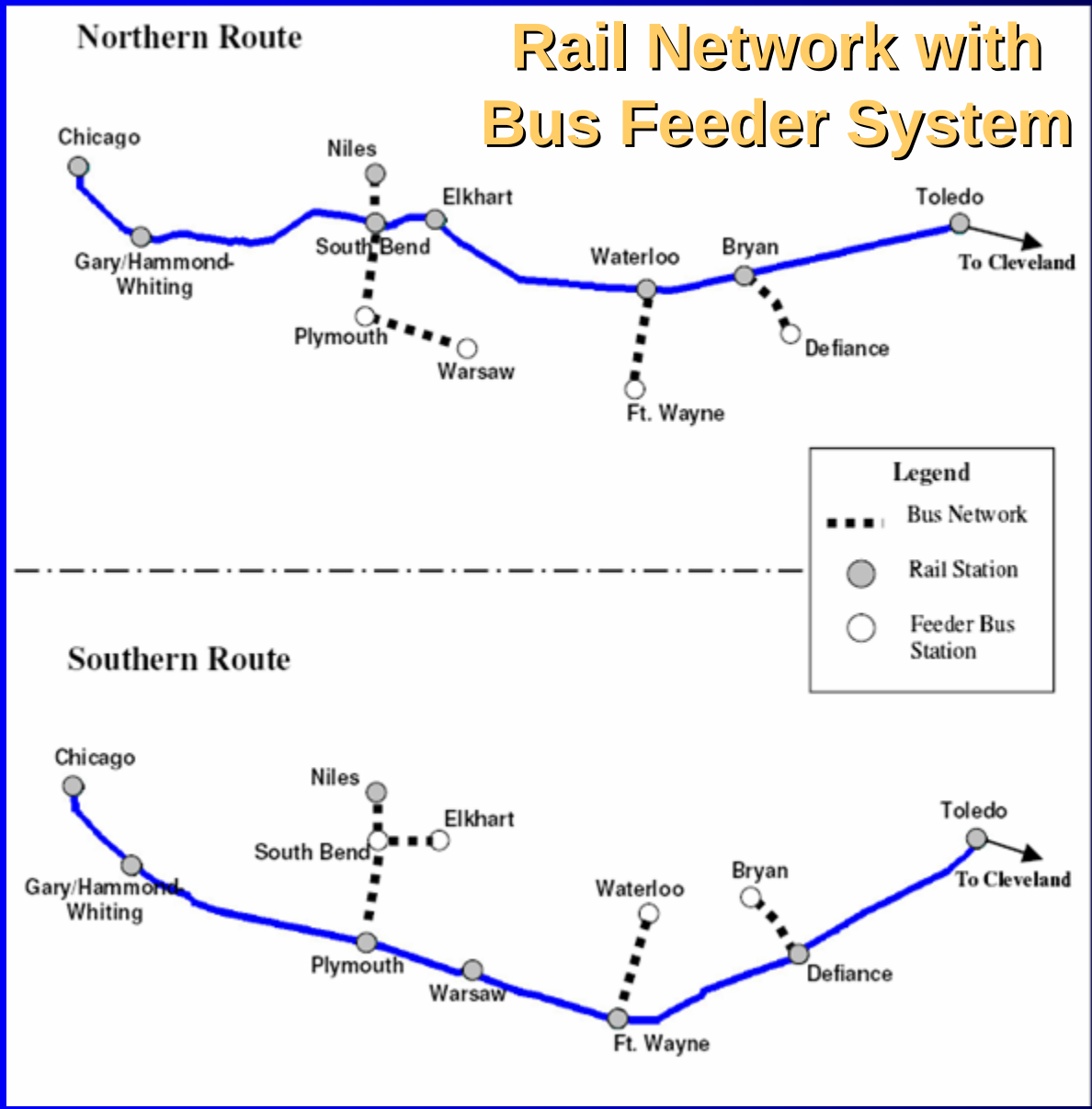
Definition of Alternative Scenarios

Alternative Scenarios

- Northern Alignment
- Southern Alignment
- Southern Alignment with Express NICTD Service



Rail Network with Bus Feeder System



Southern Route with Express NICTD Service

- Currently, NICTD provides seven round trips between South Bend and Chicago.
- A scenario was formulated that adds NICTD express service to South Bend during the morning and afternoon peak hour (in both directions).
- The express NICTD service also stops at Gary Airport (MWRR connection).
- The express NICTD train reduces travel time from South Bend to Chicago from approx. 2:30 (current) to 2:00 (express scenario).

Proposed Operating Plan

Train Technology

Travel Time and Distance Summary for Chicago to Cleveland Corridor

Alternative Route	MWRRS Norfolk Southern-Northern Route	Alternative Southern Route	Difference
Travel Time – Local Stops	5:00	4:52	8 minutes
Travel Time- Express Stops	4:32	4:23	9 minutes
Average Speed – Local Stops	68 mph	73 mph	5 mph
Average Speed – Express Stops	75 mph	80 mph	5 mph
Total Mileage	341 miles	354 miles	13 miles

Chicago – Cleveland via Northern Route

	Train Number		250	200	202	204	206	208	210	212	214
Station	Milepost	Schedule Time	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
CHICAGO, IL - UNION STATION	0.0	0:00		6:00	8:55	9:45	11:10	13:30	15:30	18:00	20:20
Gary/Hammond Whiting, IN	16.0	0:19			9:14		11:29		15:49		20:39
South Bend, IN	84.5	1:14		7:09	10:09	10:54	12:24	14:39	16:44	19:09	21:34
Elkhart, IN	101.0	1:32			10:27		12:42		17:02		21:52
Waterloo, IN	156.0	2:15			11:10		13:25		17:45		22:35
Bryan, OH	181.0	2:35			11:30		13:45		18:05		22:55
Toledo, OH	234.5	3:17	6:30	8:59	12:12	12:44	14:27	16:29	18:47	20:59	23:37
Sandusky, OH	281.5	4:00			12:55		15:10		19:30		0:20
Elyria, OH	316.5	4:35			13:30		15:45		20:05		0:55
CLEVELAND, OH	341.0	5:00	8:02	10:32	13:55	14:17	16:10	18:02	20:30	22:32	1:20

	Train Number		201	203	205	207	209	211	213	215	251
Station	Milepost	Schedule Time	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
CLEVELAND, OH	0.0	0:00	5:06	6:59	8:27	10:29	13:52	14:39	16:08	18:29	20:52
Elyria, OH	24.5	0:24		7:24		10:54		15:04		18:54	21:17
Sandusky, OH	59.5	0:59		7:59		11:29		15:39		19:29	21:51
Toledo, OH	106.5	1:42	6:39	8:42	10:00	12:12	15:25	16:22	17:41	20:12	22:35
Bryan, OH	160.0	2:24		9:24		12:54		17:04		20:54	
Waterloo, IN	185.0	2:45		9:45		13:15		17:25		21:15	
Elkhart, IN	240.0	3:27		10:27		13:57		18:07		21:57	
South Bend, IN	256.5	3:45	8:29	10:45	11:50	14:15	17:15	18:25	19:31	22:15	
Gary/Hammond Whiting, IN	325.0	4:40		11:40		15:10		19:20		23:10	
CHICAGO, IL - UNION STATION	341.0	5:00	9:39	12:00	13:00	15:30	18:25	19:40	20:41	23:30	

* Schedules are in Central Standard Time

Chicago – Cleveland via Southern Route

Train Number		Schedule Time	250	200	202	204	206	208	210	212	214
Station	Milepost		Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
CHICAGO UNION	0.0	0:00		6:00	8:55	9:45	11:10	13:30	15:30	18:00	20:20
Gary/Hammond-Whiting	23.0	0:24			9:19		11:34		15:54		20:44
Plymouth	84.7	1:08			10:03		12:18		16:38		21:28
Warsaw	109.8	1:27			10:22		12:37		16:57		21:47
Ft. Wayne	148.8	1:57		7:43	10:52	11:28	13:07	15:13	17:27	19:43	22:17
Defiance	192.4	2:35			11:30		13:45		18:05		22:55
Toledo	247.1	3:22	6:30	9:03	12:17	12:48	14:32	16:33	18:52	21:03	23:42
Sandusky	294.1	4:03			12:58		15:13		19:33		0:23
Elyria	329.1	4:30			13:25		15:40		20:00		0:50
CLEVELAND	353.6	4:52	7:50	10:23	13:47	14:08	16:02	17:53	20:22	22:23	1:12

Train Number		Schedule Time	201	203	205	207	209	211	213	215	251
Station	Milepost		Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily	Daily
CLEVELAND	0.0	0:00	5:17	7:09	8:38	10:39	14:03	14:49	16:19	18:39	21:08
Elyria	24.5	0:20		7:29		10:59		15:09		18:59	21:28
Sandusky	59.5	0:46		7:55		11:25		15:35		19:25	21:54
Toledo	106.5	1:27	6:35	8:36	9:56	12:06	15:21	16:16	17:37	20:06	22:35
Defiance	161.2	2:11		9:20		12:50		17:00		20:50	
Ft. Wayne	204.8	2:49	7:52	9:59	11:13	13:29	16:38	17:39	18:54	21:29	
Warsaw	243.8	3:19		10:29		13:59		18:09		21:59	
Plymouth	268.9	3:39		10:48		14:18		18:28		22:18	
Gary/Hammond-Whiting	330.6	4:23		11:32		15:02		19:12		23:02	
CHICAGO UNION	353.6	4:50	9:39	12:00	13:00	15:30	18:25	19:40	20:41	23:30	

* Schedules are in Central Standard Time

Operating Costs

Operating Costs

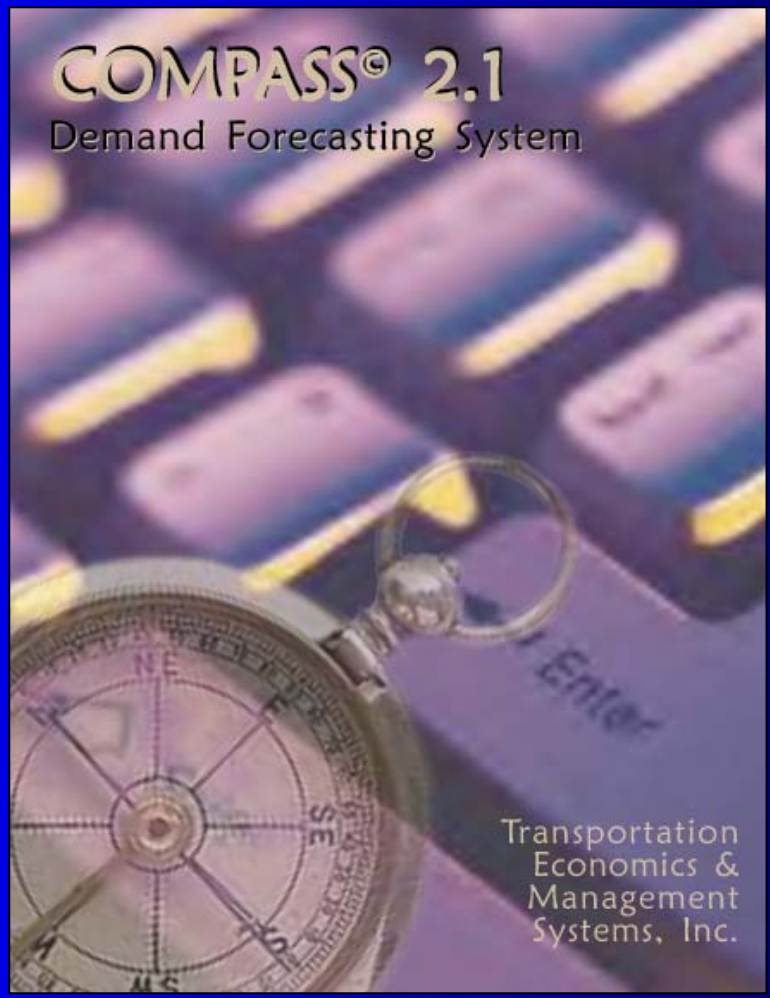
- MWRRS Phase 3B unit operating costs have been adopted for this study.
- The annual operating costs for both the Northern and Southern Routing alternatives are found to be similar, differing by a factor of only 2%.
- Study assumes that operating costs will be equal for both alternatives.

Ridership and Revenue Analysis

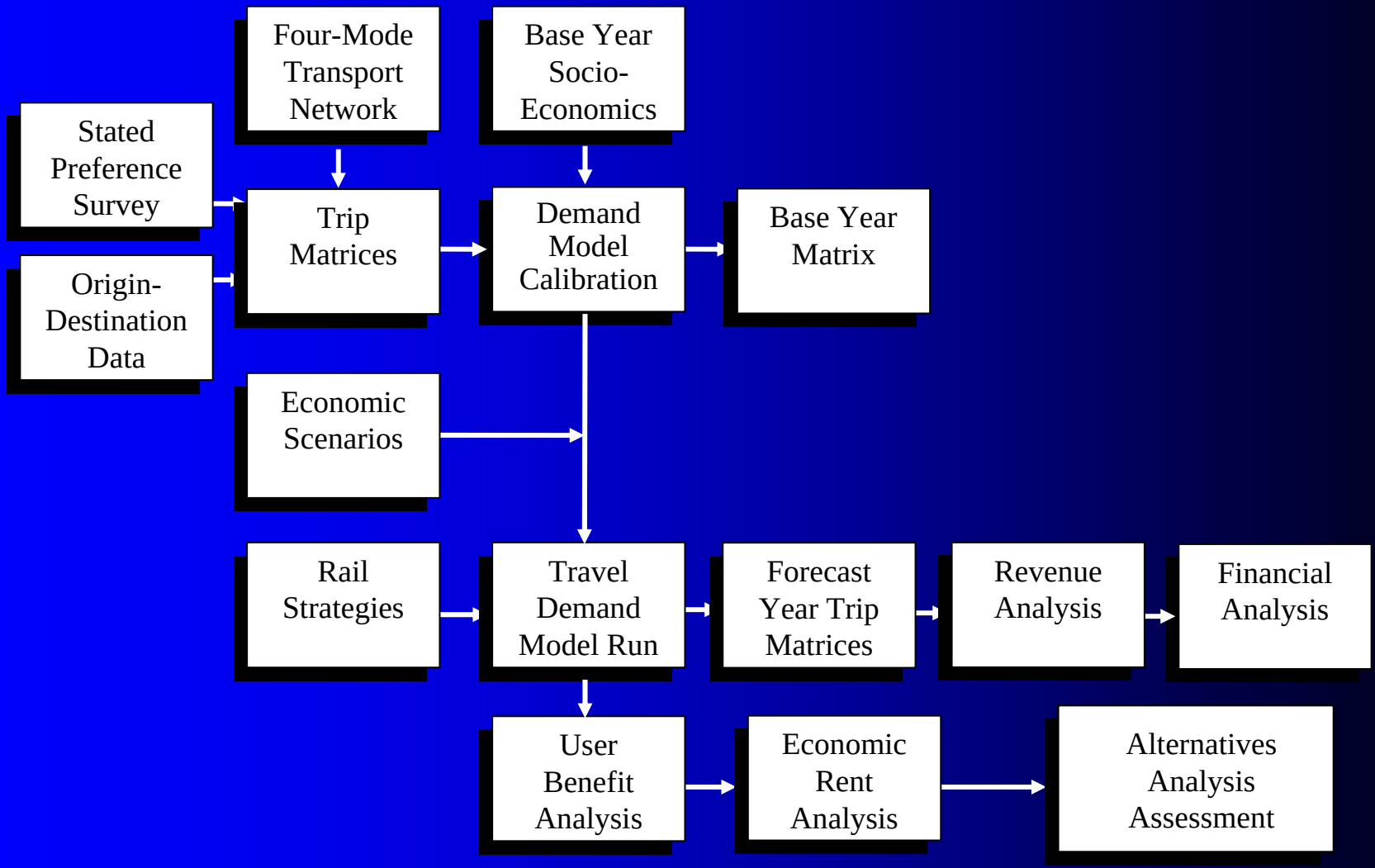
Ridership and Revenue Outline

- *COMPASS*© Demand Forecasting Software
- Rail & Associated Bus Feeder Network
- Ridership and Revenue Forecasts

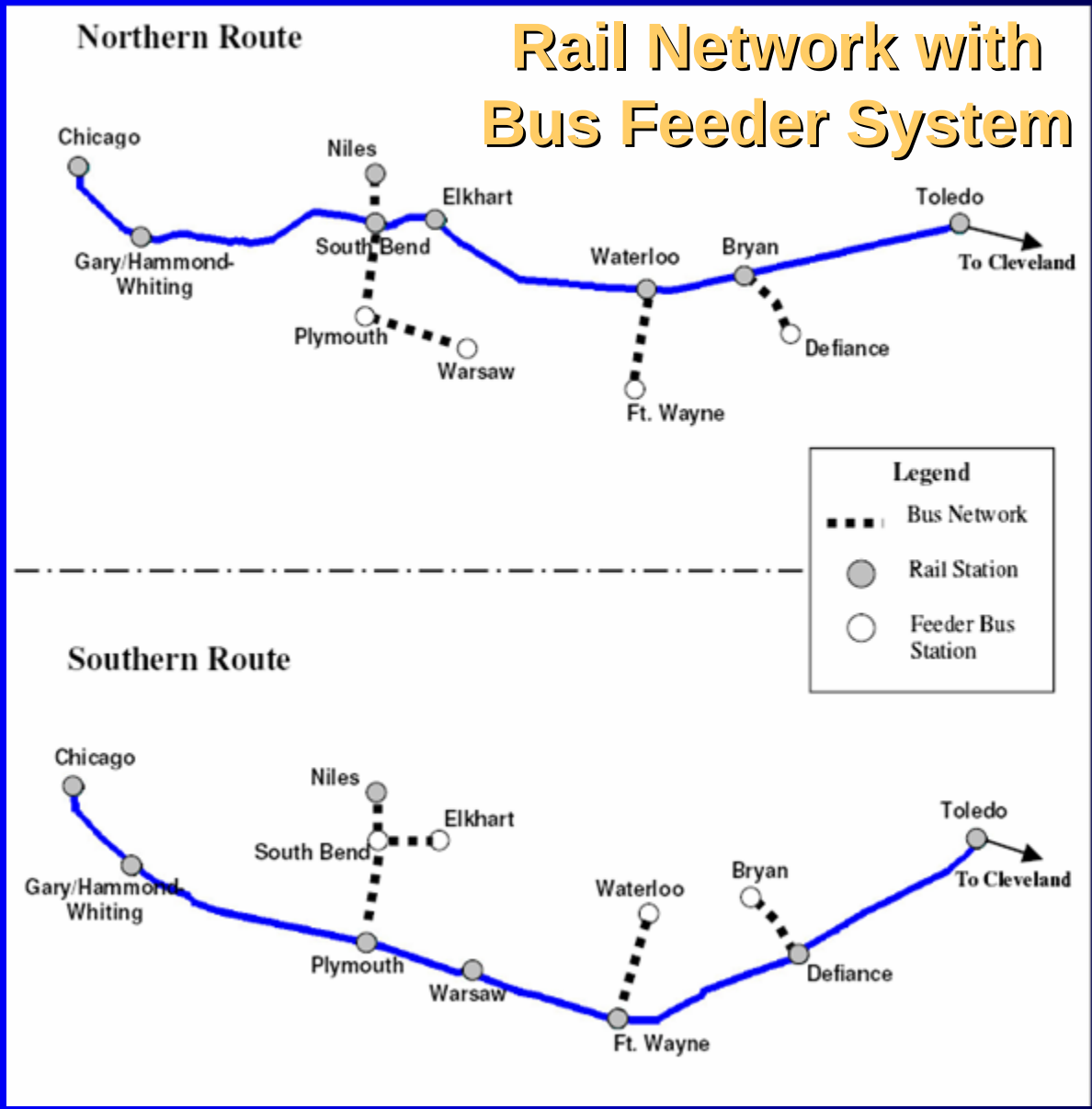
COMPASS© Demand Forecasting Software



COMPASS© Model Structure



Rail Network with Bus Feeder System



Corridor Ridership Comparison

Year	Annual Ridership (Annual Trips)		
	Northern Route	Southern Route	Difference
2010 (Phase 4)	741,266	866,859	125,593
2011 (Phase 5)	795,877	931,156	135,279
2012 (Phase 6)	821,621	961,687	140,066
2015*	854,354	1,001,252	146,898
2020*	908,907	1,067,194	158,287
2023*	949,256	1,114,517	165,261
2033*	1,083,756	1,272,259	188,503
2040*	1,177,905	1,382,679	204,774
2042*	1,205,262	1,414,585	209,323
* MWRRS System Fully Implemented			

Corridor Farebox Revenue Comparison

Year	Annual Farebox Revenue (Millions of $2002)		
	Northern Route	Southern Route	Difference
2010 (Phase 4)	$44.540	$49.770	5.230
2011 (Phase 5)	$46.780	$52.303	5.523
2012 (Phase 6)	$47.950	$53.627	5.677
2015*	$49.830	$55.748	5.918
2020*	$52.950	$59.284	6.334
2023*	$55.284	$61.885	6.601
2033*	$63.842	$70.553	6.711
2040*	$68.520	$76.621	8.101
2042*	$70.102	$78.396	8.294
* MWRRS System Fully Implemented			

Corridor Passenger Miles Comparison

Year	Annual Passenger Miles (Millions)		
	Northern Route	Southern Route	Difference
2010 (Phase 4)	164.304	218.373	54.069
2011 (Phase 5)	176.281	231.302	55.021
2012 (Phase 6)	182.103	237.785	55.682
2015*	189.340	247.326	57.986
2020*	201.400	263.230	61.830
2023*	210.364	274.876	64.512
2033*	240.245	313.696	73.451
2040*	261.161	340.870	79.709
2042*	267.236	348.812	81.576
* MWRRS System Fully Implemented			

Annual Station Volumes by Trip Purpose (Southern Route, 2020)

Stations	Business	Non-Business	Total
Gary/HMW *	22,593	66,680	89,273
Plymouth	7,454	42,258	49,712
Warsaw	4,223	24,023	28,246
Ft. Wayne	48,491	95,884	144,375
Defiance	8,039	39,212	47,251
Toledo	53,320	201,520	254,840
Sandusky	6,230	33,666	39,896
Elyria	6,838	51,638	58,476
Cleveland	80,071	313,368	393,439
* Station used for multiple corridors			

Southern Route Ridership and Revenue Forecast with Improved NICTD Service

Year	MWRR Ridership (Annual Trips)	Express NICTD Ridership (Annual Trips)	Farebox Revenue (Millions of $2002)
2010 (Phase 4)	859,059	186,150	$52.052
2011 (Phase 5)	930,924	186,150	$54.560
2012 (Phase 6)	954,047	186,150	$55.871
2015*	999,208	186,150	$57.971
2020*	1,060,808	186,150	$61.471
2023*	1,107,795	186,150	$64.046
2033*	1,264,420	186,150	$72.628
2040*	1,374,057	186,150	$78.635
2042*	1,405,660	186,150	$80.392

* MWRR system fully implemented

Note: Fare box revenues include additional NICTD revenue, but exclude on-board services and express parcels.

Annual Station Volumes by Trip Purpose (Northern Route, 2020)

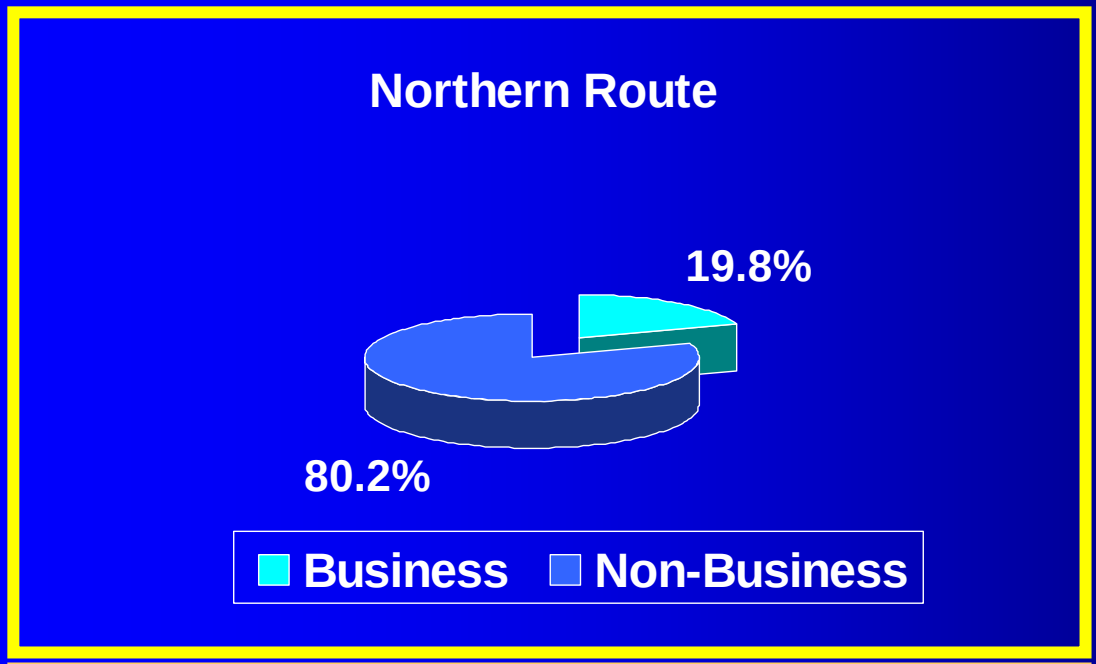
Stations	Business	Non-Business	Total
Gary/HMW *	21,104	62,584	83,688
South Bend	12,350	60,170	72,520
Elkhart	5,864	40,054	45,918
Waterloo	10,212	41,009	51,221
Bryan	3,600	20,990	24,590
Toledo	51,933	190,780	242,713
Sandusky	6,599	31,642	38,241
Elyria	6,692	50,155	56,847
Cleveland	79,722	301,274	380,996
* Station used for multiple corridors			

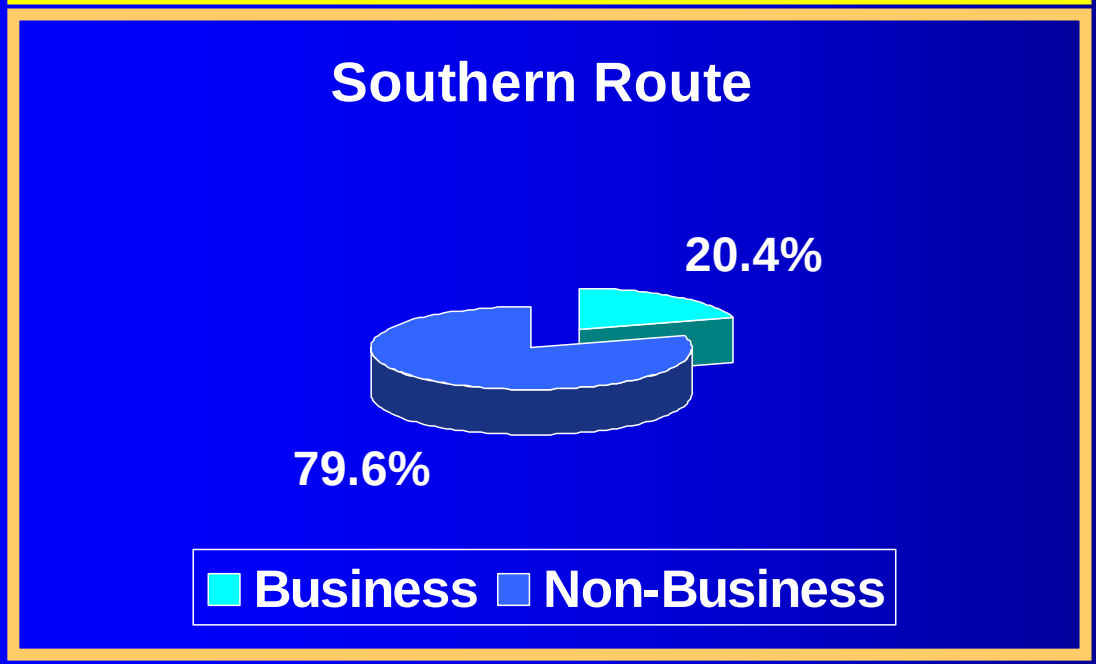
Station Volume Comparison

	Total Station Volumes		
Rail Station	**Northern Route**	**Southern Route**	**Difference**
Toledo	242,713	254,840	12,127
Sandusky	38,241	39,896	1,655
Elyria	56,847	58,476	1,629
Cleveland	380,996	393,439	12,443
Sub Total	718,797	746,651	27,854

Ridership & Revenue Comparison with NICTD Express Service

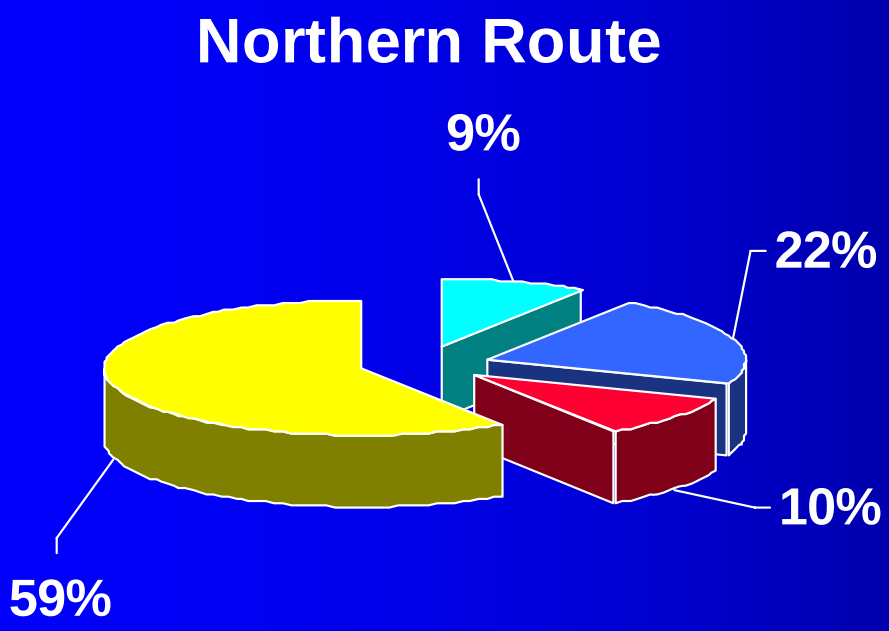
	Southern Route Ridership & Revenue			
	Ridership (Annual Trips)		MWRR Farebox Revenue (Millions of 2002$)	
Year	Without Express NICTD	With Express NICTD	Without Express NICTD	With Express NICTD
2010 (Phase 4)	866,859	859,059	$49.770	$52.052
2011 (Phase 5)	931,156	930,924	$52.303	$54.560
2012 (Phase 6)	961,687	954,047	$53.627	$55.871
2015*	1,001,252	999,208	$55.748	$57.971
2020*	1,067,194	1,060,808	$59.284	$61.471
2023*	1,114,517	1,107,795	$61.885	$64.046
2033*	1,272,259	1,264,420	$70.553	$72.628
2040*	1,382,679	1,374,057	$76.621	$78.635
2042*	1,414,585	1,405,660	$78.396	$80.392
Note: Farebox revenues include additional NICTD revenue, but exclude on-board services and express parcels.				
* MWRRS System Fully Implemented				

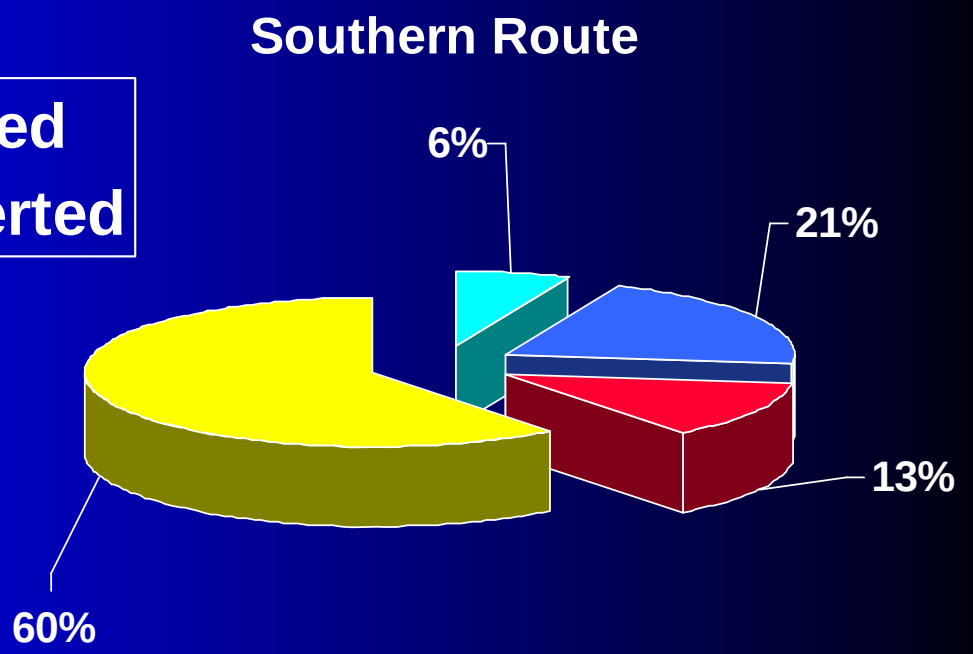




Corridor Trip Purpose Breakdown (2020)

Corridor Demand Breakdown by Type (2020)





Summation of Ridership and Revenue Results

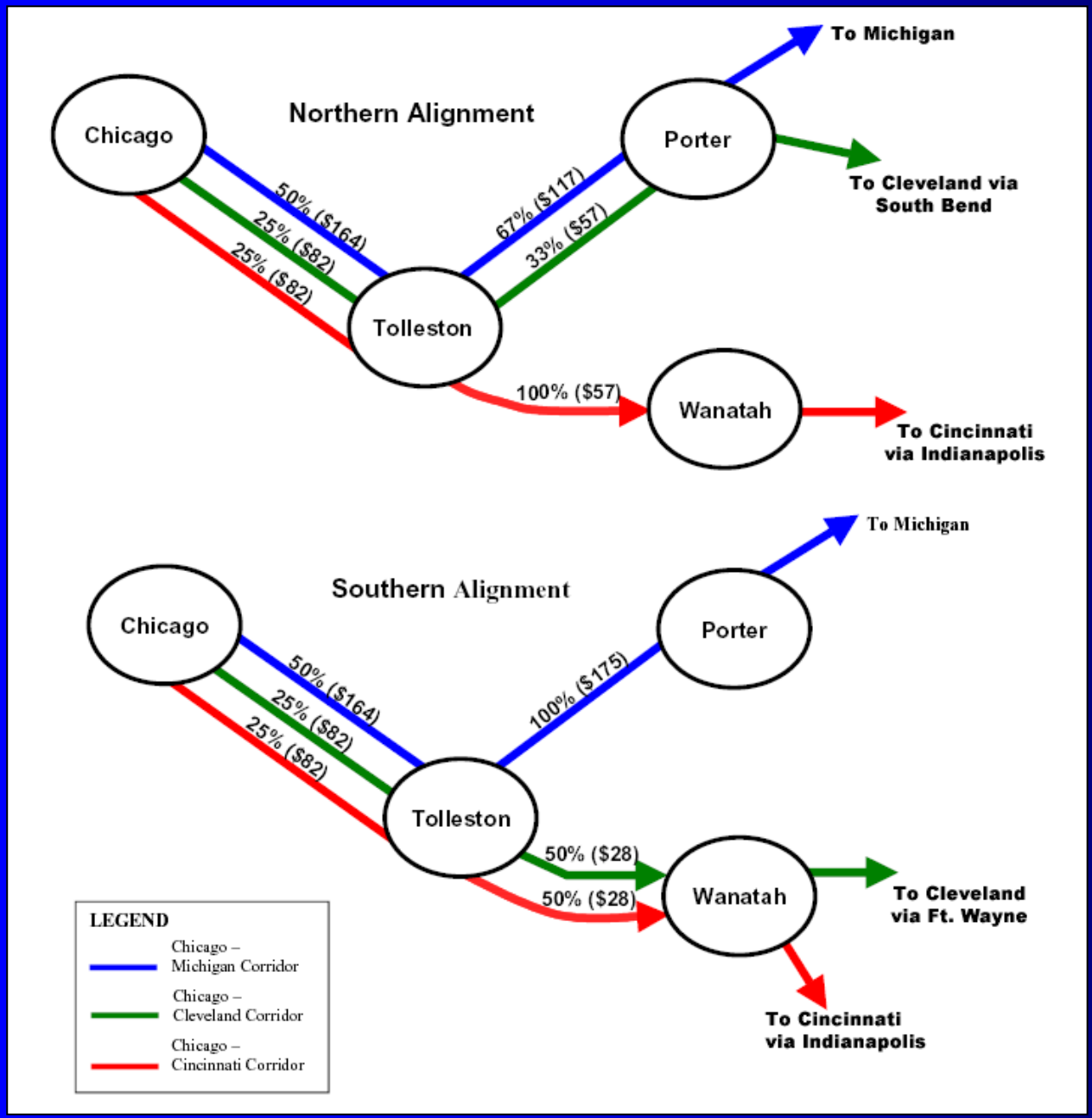
- With respect to ridership and revenue, the Southern route has produced greater values for both.
- A fundamental reason for the additional ridership and revenue for the Southern route is the contribution from a rail station in Fort Wayne.
- The Southern route also benefits from the decreased travel time (e.g., higher station volumes in Toledo and Cleveland).

Capital Costs

Breakdown of Infrastructure Costs

Alignment and Segment	Total Cost ($2002)
Northern Alignment:	
Segment 1: Chicago to Porter	$139,621,060
Segment 2: Porter to IN/OH Line	$601,623,000
Segment 3: IN/OH Line to Toledo	$298,190,000
Segment 4: Toledo to Berea	$345,302,000
Segment 5: Berea to Cleveland	$142,749,000
Total	**$1,527,486,060**
Southern Alignment:	
Segment 1: Chicago to Tolleston	$82,017,250
Segment 2: Tolleston to Wanatah	$28,327,000
Segment 3: Wanatah to Mike Junction	$174,521,340
Segment 4: Mike Junction to New Haven	$45,643,007
Segment 5: New Haven to Liberty Center	$211,121,798
Segment 6: Liberty Center to Delta	$17,650,930
Segment 7: Delta to Toledo	$116,137,158
Segment 8: Toledo to Berea	$345,302,00
Segment 9: Berea to Cleveland	$142,749,000
Total	**$1,163,469,483**

South of the Lake Infrastructure Cost Allocation



Total Capital Investment by Alternative Route

Service	Total Cost	
	Northern Route	**Southern Route**
Infrastructure	$1,527,486,060	$1,163,469,483
Track and R.O.W.		$20,000,000
Rolling Stock for Intercity Service	$75,600,000	$75,600,000
Total	**$1,603,086,060**	**$1,259,069,483**
Note: Costs are in $2002		

Total Capital Costs (NICTD Scenario)

Service	Total Cost	
	Southern Route	Southern Route with Express NICTD
Infrastructure	$1,163,469,483	$1,163,796,483
Track and R.O.W.	$20,000,000	$20,000,000
Rolling Stock for Intercity Service	$75,600,000	$75,600,000
Rolling Stock for NICTD Commuter Service		$9,809,620
Additional NICTD Infrastructure		$30,000,000
Total	$1,259,069,483	$1,298,879,103
Note: Costs are in 2002 Dollars		

Financial Analysis

Financial Results

- Financial benefit is measured by Operating Ratios

$$\text{Operating\_Ratio} = \frac{\text{Operating\_Revenue}}{\text{Operating\_Cost}}$$

- Both Routes have similar operating costs.
- The Southern Route produces greater operating revenue.
- Therefore, the Southern Route produces better financial results.

Economic Evaluation

Cost Benefit Analysis with NICTD Express

Parameter	30-Year Net Present Value (in Millions of 2002$)		
	Northern Route	Southern Route	
		Without Express NICTD	With Express NICTD
Benefits			
Revenue	$1,045.57	$1,169.96	$1,198.88
Consumer Surplus	$1,003.85	$1,235.59	$1,240.14
Other Mode User Benefits			
Airport Congestion	$2.06	$2.23	$2.06
Highway Congestion	$4.44	$4.35	$4.44
Resources Benefits			
Airlines	$1.109	$1.199	$1.110
Emissions	$0.070	$0.075	$0.070
Total Benefits	**$2,057.10**	**$2,413.40**	**$2,446.71**
Total Costs*	**$2,335.90**	**$2,017.92**	**$2,112.18**
Ratio of Benefits to Costs	**0.88**	**1.20**	**1.16**

*** Un-negotiated costs that show relative magnitude, but may not show final dollar figures.**

Conclusions and Recommendations

Conclusions and Recommendations

- In financial and economic terms, the Southern Route, both with and without express NICTD service, will be more beneficial than the Northern Route.
- Much of the benefit of the Northern Route is captured by providing express NICTD service to South Bend.

Conclusions and Recommendations (cont.)

- The Southern Route with Express NICTD service maximizes the benefits to travelers to Northern Indiana and across the entire MWRRI system; therefore, the Southern Route with Express NICTD service is the strategy recommended.

Thank You