

Potential Economic Benefits of High Speed Rail Lines

Emmanuel S. "Bruce" Horowitz
Principal

ESH Consult
Creative Passenger Rail
Transportation Economics

Presentation Outline

- Review of recent economic benefits study for proposed 220 MPH ORD-CHI-STL HSR Line
- Broad observations comparing economic benefits potential of 220 MPH HSR with incremental (Higher) Speed Rail

220 MPH HSR Case Study

- In 2009, the Mid-West High Speed Rail Association contracted with TranSystems Corp and ESH Consult to conduct an Engineering Feasibility and Economic Benefits Study of a 220 MPH ORD-CHI-STL High Speed Rail system
- The following economic forecasts are abstracted from the “Sketch Level Economic Benefits” portion of the study

May 4, 2010

ESH Consult

PROPOSED ORD-CHI-STL 220 MPH HSR ROUTE

Chicago - St. Louis
Intermediate Cities in Corridors Reviewed
Current Populations



ROUTE: NEW HYBRID “EASTERN” ROUTE
KEY CITIES: ORD-CHI-CHM-DEC-SPI-STL
MAX SPEED: 220 MPH
ROW: FULLY GRADE-SEPARATED (RY & HWY)
PROPOSED SERVICE: 17+ DAILY RT'S
FACILITY COST: \$14 B (SOME EXCLUSIONS)
SCHEDULE TIME CHI-STL: 1 HR 52 MIN
COACH FARES: CHI-STL \$46; CHI-CHM \$20
ANNUAL RIDERSHIP: 3.3 MILLION

Source: U.S. Census 2000 Estimates

ESH Consult

BROAD BENEFIT CATEGORIES Quantified for ORD-CHI-STL

- Economic benefits for key cities along the new 220 HSR route
- Economic/Safety benefits for 220 HSR users
- Economic/Safety benefits for non-users

May 4, 2010

ESH Consult

Economic Benefits for Key Cities Along the New 220 HSR Route

- Direct and secondary job creation during construction
- Ongoing direct and secondary job creation after revenue service begins
- Long-term ongoing job creation from increased local economic activity

May 4, 2010

ESH Consult

220 HSR Construction Job Creation Results

	Construction Capital Cost (000,000)	Estim. Total Construction Job-Years	Annual Jobs (during 7-year constr. period)	Avg. Annual Jobs w/ Multiplier
CHI Metro	\$2,650	18,310	2,616	5,493
KKE area	\$3,772	26,062	3,723	7,819
CHM area	\$1,543	10,663	1,523	3,199
DEC area	\$1,529	10,565	1,509	3,170
SPI area	\$2,253	15,566	2,224	4,670
STL Metro	\$904	6,246	892	1,874
Total	\$12,652	87,412	12,487	26,224

May 4, 2010

ESH Consult

220 HSR O&M Revenue Service Job Creation Results

	Direct O&M Jobs Created	Total Jobs with "Multiplier-Effect"
CHI Metro	208	436.8
KKE area	10.4	21.84
CHM area	15.6	32.76
DEC area	36.4	76.44
SPI area	15.6	32.76
STL Metro	144.3	303.3
Total	430.3	903.6

May 4, 2010

ESH Consult

220 HSR Economic Activity-Induced Job Creation Results

	Estimated Base Regional Jobs (000)	Avg. % Econ Activity Growth from HSR	Estimated New Annual Regional Jobs
CHI Metro	2,837	0.3%	9,225
KKE area	35	3%	771
CHM area	99	1.5%	1,590
DEC area	54	1.5%	953
SPI area	81	1%	1,010
STL Metro	568	0.5%	2,841
Total	3,675	N/A	16,390

May 4, 2010

ESH Consult

Job Benefits Along the HSR Route -- Summary Results

- 87,000 job-years during construction period, averaging 12,500 annual jobs created
- 26,000 annual total jobs with multiplier-effect
- 430 annual jobs created for HSR O&M
- 900 annual total O&M jobs including multiplier-effect
- 16,000 additional jobs from increased regional economic activity

May 4, 2010

ESH Consult

Economic/Safety Benefits to 220 HSR Users

- User Value-of-Time (VOT) Benefit (Quantified)
- User Safety Benefit (Quantified)
- Net Consumer Surplus

May 4, 2010

ESH Consult

220 User Value of Time Results

Sample O/D's (Original Mode)	Annual Passengers	HSR trip time incl. feeder	Original mode time (auto/ATK)	Net Trip time savings	Monetized Trip Savings	Total savings (000)
ORD/CHI (auto)	158,601	0.3	1	0.7	\$15.40	\$2,442
CHI/STL (auto)	278,250	3.5	5.5	2.0	\$44.60	\$12,410
CHI/SPI (auto)	322,449	2.75	3.9	1.2	\$26.30	\$8,480
CHI/STL (Amtrak)	71,490	2	5.5	3.5	\$77.00	\$5,505
CHI/SPI (Amtrak)	58,701	1.25	2.8	1.5	\$33.00	\$1,937
TOTAL (all O/Ds Auto/ATK)	1,629,420					\$35,656

May 4, 2010

ESH Consult

220 User Safety Benefit Results

O/D (sample city pairs)	Annual Passengers	Total P-M (000)	Total VMT (000)	Non-fatal accident Reduction	Fatal Accident Reduction	Monetized Savings (000)
CHI/STL	278,250	84,588	65,068	53.4	.88	\$18,471
CHI/SPI	335,542	72,813	56,010	45.9	.76	\$15,900
TOTAL (all O/D's)	1,382,072	248,431	191,101	156.7	2.6	\$53,626

May 4, 2010

ESH Consult

220 User Consumer Surplus Results

Sample O/Ds	Annual Passengers	HSR avg fare	Feeder/ Distrib \$ (transit/taxi)	Auto Trip cost	Trip savings	Total savings (000)
CHI/STL	278,250	\$62.80	\$20	\$146	\$63	\$17,563
CHI/SPI	322,449	\$45	\$25	\$104	\$34	\$11,015
TOTAL (all O/Ds)	1,426,882	--	--	--	--	\$40,309

May 4, 2010

ESH Consult

220 User Economic/Safety Benefits Summary Results

- 1.6 million diverted auto and Amtrak users will save \$35.6 M annually in Value-of-Time
- 1.4 million diverted auto users will experience 157 fewer non-fatal and 2.6 fewer fatal accidents annually, monetized at \$53.6 M.
- 1.4 million annual diverted auto users will enjoy a consumer surplus of \$40.3 M

May 4, 2010

ESH Consult

220 Economic/Safety Benefits for Non-Users

- Time savings at newly separated freight grade-crossings (quantified)
- Accident reduction at newly separated freight grade-crossings (monetized)
- Fatality reduction at newly separated freight grade-crossings (monetized)

May 4, 2010

ESH Consult

220 Grade Crossing Elimination Time Savings -- Results

Route Segment	Crossings Separated	Annual Hours Saved	Monetized Time Savings (000)
CHI Metro	16	71,248	\$1,567
KKE area	50	17,155	\$377
CHM area	20	5,877	\$129
DEC Area	23	8,943	\$197
SPI area	49	12,739	\$280
STL Metro	6	876	\$19
TOTAL	164	116,837	\$2,570

May 4, 2010

ESH Consult

220 Grade Crossing Elimination Accident / Fatality Reduction -- Results

Route Segment	Crossings Separated	Crossings Closed	Annual Non-fatal Accidents Reduced	Annual Fatality Accidents Reduced	Monetized Value Safety Improvement (000)
CHI Metro	16	0	0.579	0.174	\$1,152
KKE area	50	20	0.365	0.110	\$727
CHM area	20	20	0.090	0.027	\$179
DEC Area	23	20	0.133	0.040	\$266
SPI area	49	20	0.197	0.059	\$392
STL Metro	6	6	0.014	0.004	\$28
TOTAL	164	98	1.379	0.414	\$2,745

May 4, 2010

ESH Consult

220 Non-User Economic/Safety Benefits -- Summary Results

- 117,000 hours will be saved annually at 164 newly separated crossings
- The monetized value-of-time for this savings is \$2.6 M annually
- An estimated 1.4 non-fatal accidents and 0.4 fatalities will be avoided through 164 new separations and 98 closures
- The monetized value of accident reduction is \$2.7 M annually

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits

- The following observations are based on research and findings during development of the ORD-CHI-STL Economic Benefits Study
- All of the broad observations are the opinion of this author and do not represent official positions of the Midwest High Speed Rail Association or TranSystems Corp

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits – Profitability

- 220 HSR will generate sufficient operating profit to offset at least a portion of initial investment cost, providing impetus for PPP
- Incremental HSR will reduce operating subsidy requirement and in some cases result in operating self-sufficiency

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits – Job Creation

- Construction-related, O&M and secondary job creation has much greater % impact on intermediate cities than end-points
- Construction-related, O&M and secondary job creation is largely proportional to initial investment and ongoing O&M cost for both incremental and 220 HSR

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits – Job Creation

- Economic development-related job creation has greatest % impact on intermediate cities
- Economic development-related job creation is disproportionately greater for 220 HSR than incremental (step function)

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits – User V-O-T

- User V-O-T savings, quantified safety benefits and travel-cost-related consumer surplus are most significant for new HSR users (both 220 and incremental) diverted from auto mode
- User V-O-T savings, quantified safety benefits and travel-cost-related consumer surplus are proportionally greater for 220 because of higher % diversion from auto mode

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits -- Safety

- Significant safety and time savings benefits for non-HSR users resulting from grade crossing separations are likely to occur only in 220 HSR which requires total grade separation resulting in positive “collateral” separation of parallel freight lines

May 4, 2010

ESH Consult

Broad Observations on HSR Economic Benefits – Land Use

- Positive land-use changes and property value increases will be significantly greater for 220 HSR than incremental because of “new travel mode” effect and induced demand
- Potential for Transit-Oriented-Development (TOD) surrounding stations of 220 HSR is more significant than for incremental systems

May 4, 2010

ESH Consult

Thank You

- Thank you for your attention
- Questions and comments are welcome

Contact Information:

Emmanuel S. "Bruce" Horowitz

Principal, ESH Consult

BruceHorowitz1@Hotmail.com

www.ESHconsult.com

May 4, 2010

ESH Consult
Creative Passenger Rail
Transportation Economics