Development of 220 mph High Speed Rail Service for Illinois

Mark C. Walbrun, PE
TranSystems Corporation
Study Purpose

- Worldwide Use of High Speed Rail Technology
  - Japan, France, Italy, Germany, Spain, China, UK
- Feasibility of 220 mph Alternative to 110 mph Chicago – St. Louis
- Alternative Alignment to Serve Champaign and Decatur
- Use of Railroad Corridors for HSR Right of Way
- Develop Cost Estimate & Phasing Plan
Design Criteria

- Trains Based on UIC Standards (Non-FRA Compliant)
- Requires Separate Dedicated Alignment
- Same Criteria as California and Florida HSR Systems
Key Findings

- Feasible for HSR to Share Existing 100 ft Railroad Right of Way
- Grade Separated Alignment Can Be Created Providing Benefits to Both Communities and Railroads
- Chicago – St’ Louis Travel Time 1h52m for a non-stop train
- Infrastructure Cost $11.5B
Background

Chicago-St. Louis Corridor - 1937

- 3 main routes
- 4h55m service operated on 2

<table>
<thead>
<tr>
<th>Historical Route (1937)</th>
<th>Miles</th>
<th>Through trips</th>
<th>Fastest Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago &amp; Alton</td>
<td>283.9</td>
<td>6</td>
<td>4:55</td>
</tr>
<tr>
<td>Wabash</td>
<td>285.7</td>
<td>3</td>
<td>5:15</td>
</tr>
<tr>
<td>Illinois Central</td>
<td>294.2</td>
<td>3</td>
<td>4:55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Miles</th>
<th>Through trips</th>
<th>Fastest Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amtrak in 2009</td>
<td>283.9</td>
<td>6</td>
<td>5:20</td>
</tr>
<tr>
<td>Final EIS Chicago-St. Louis HSR Project (Jan. 2003)</td>
<td>283.9</td>
<td>3</td>
<td>4:00</td>
</tr>
<tr>
<td>Current Study, 220 mph Express Service via Champaign/Decatur/Springfield</td>
<td>306.9</td>
<td>Hourly</td>
<td>1:52</td>
</tr>
</tbody>
</table>

Source: Chicago St. Louis HSR Association
Chicago – St. Louis Routing via Champaign

- Champaign and the Research Activities at UIUC Have Increased Prominence and Need for Connectivity to Business Centers
- At 220 mph the Extra Distance to Serve Champaign Takes and Additional 6 minutes
- Use of the Former Illinois Central Railroad Right-of-Way Allows for Very Fast Operations
The Alignment

- Urban Segments
- Rural Segments
O’Hare Western Terminal

- Significant Ridership Base
- NW Suburbs Have 2.5M Population, Same as St. Louis
- Allows Full Air-Rail Integration
- Space Available for Adding Tracks Next to Metra
- 3 Key Flyovers Required
- Enables Lower Cost Site for Fleet Storage & Maintenance
O'Hare Western Terminal

- Significant Ridership Base
- NW Suburbs Have 2.5M Population, Same as St. Louis
- Allows Full Air-Rail Integration
- Space Available for Adding Tracks Next to Metra
- 3 Key Flyovers Required
- Enables Lower Cost Site for Fleet Storage & Maintenance
O'Hare Western Terminal

- Significant Ridership Base
- NW Suburbs Have 2.5M Population, Same as St. Louis
- Allows Full Air-Rail Integration
- Space Available for Adding Tracks Next to Metra
- 3 Key Flyovers Required
- Enables Lower Cost Site for Fleet Storage & Maintenance

Chicago-St. Louis 220 mph HSR
Urban Segments - Chicago

Serves

- Union Station
  - Amtrak, Metra, CTA, Loop
- McCormick Place
  - Largest Convention Center in US

Chicago-St. Louis 220 mph HSR
Urban Segments - Chicago

Serves

- Union Station
  - Amtrak, Metra, CTA, Loop
- McCormick Place
  - Largest Convention Center in US
Urban Segments - Champaign

- UIUC Access
- Serves New “Illinois Terminal” Station

Chicago-St. Louis 220 mph HSR
Urban Segments - Decatur

- ADM Headquarters
- Proposed Routing Avoids Complexity of RR Yards East of Downtown
- Operation via I-72 Alignment is Also an Option
Urban Segments - Springfield

- Planned to Use 10th Street Corridor
- Potential Interchange Station with Existing Amtrak Service
- Serves State Capital
Urban Segments – St. Louis

• A “Greenfield” Metro East station is proposed, as well use of new Gateway station
Rural Segments

- Plan is based on purchase of portion of ROW from Railroads
- Existing railroads would generally be separated as well
- Grade separation achieved through construction of separation for about half of the crossings and closing the others; essentially same strategy as utilized in construction of Interstates
- Possible alternative would be construction of a new alignment which would probably have lower cost but, more complex environmental clearance
Garnering Stakeholder Support

- Cities Served
- Rural Communities
- Railroads
- Contractors
- Airlines
- Tourism

### Midwest High Speed Rail Study
Chicago (O’Hare) to St. Louis (Downtown) (220 mph)
Rail/Roadway Construction Cost Breakout

<table>
<thead>
<tr>
<th>ITEM DESCRIPTION</th>
<th>UNIT COST</th>
<th>TOTAL COST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Railroad Construction</td>
<td>$7,990,769,499</td>
<td>63.4%</td>
</tr>
<tr>
<td>Trackwork</td>
<td>$1,902,185,017</td>
<td></td>
</tr>
<tr>
<td>Electrification</td>
<td>$1,265,620,140</td>
<td></td>
</tr>
<tr>
<td>Signaling</td>
<td>$353,750,800</td>
<td></td>
</tr>
<tr>
<td>Bridges</td>
<td>$690,787,900</td>
<td></td>
</tr>
<tr>
<td>Flyovers</td>
<td>$799,876,213</td>
<td></td>
</tr>
<tr>
<td>Property &amp; ROW</td>
<td>$305,402,040</td>
<td></td>
</tr>
<tr>
<td>Allocated Engineering, Final Design, PM, CM (12%)</td>
<td>$601,466,408</td>
<td></td>
</tr>
<tr>
<td>Allocated Contingency (35%)</td>
<td>$2,071,680,981</td>
<td></td>
</tr>
<tr>
<td>Roadway Construction</td>
<td>$4,618,009,882</td>
<td>36.6%</td>
</tr>
<tr>
<td>Rural Grade Separations (Type I &amp; II)</td>
<td>$231,046,920</td>
<td></td>
</tr>
<tr>
<td>Urban Grade Separations (Trench &amp; Embankment)</td>
<td>$2,641,558,485</td>
<td></td>
</tr>
<tr>
<td>Bridge, Roadway (Includes Sub Structure)</td>
<td>$6,888,000</td>
<td></td>
</tr>
<tr>
<td>Al-Grade Crossing Protection</td>
<td>$ -</td>
<td></td>
</tr>
<tr>
<td>Utilities &amp; Environmental</td>
<td>$174,745,935</td>
<td></td>
</tr>
<tr>
<td>Allocated Engineering, Final Design, PM, CM (12%)</td>
<td>$368,558,721</td>
<td></td>
</tr>
<tr>
<td>Allocated Contingency (35%)</td>
<td>$1,197,261,821</td>
<td></td>
</tr>
<tr>
<td>TOTAL PRELIMINARY COSTS</td>
<td>$12,609,000,000</td>
<td>100%</td>
</tr>
<tr>
<td>SEGMENT</td>
<td>APPROXIMATE SEGMENT COST (in Millions)</td>
<td>APPROXIMATE CUMULATIVE COST (in Millions)</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>---------------------------------------</td>
<td>-------------------------------------------</td>
</tr>
<tr>
<td>O'Hare Airport to Chicago Union Station</td>
<td>$1,012</td>
<td>$1,012</td>
</tr>
<tr>
<td>Chicago Union Station to McCormick Place</td>
<td>$119</td>
<td>$1,131</td>
</tr>
<tr>
<td>McCormick Place to Kankakee</td>
<td>$2,719</td>
<td>$3,850</td>
</tr>
<tr>
<td>Kankakee to Champaign</td>
<td>$2,818</td>
<td>$6,668</td>
</tr>
<tr>
<td>Champaign to Decatur</td>
<td>$1,741</td>
<td>$8,409</td>
</tr>
<tr>
<td>Decatur to Springfield</td>
<td>$1,358</td>
<td>$9,767</td>
</tr>
<tr>
<td>Springfield to Metro East</td>
<td>$1,861</td>
<td>$11,629</td>
</tr>
<tr>
<td>Metro East to Downtown St. Louis</td>
<td>$904</td>
<td>$12,533</td>
</tr>
</tbody>
</table>

Costs include ROW acquisition, but not trains, stations, maintenance facilities.
Ridership Estimates

- Fare Systems Studied - $46 Standard Class Chicago – St. Louis
- Estimated Passenger Miles per Year – 581,578,000
- Estimated Passenger Trips per Year – 3,000,000
- PM/TM – 399, Train Capacity 500, 80% Load Factor
- Revenue - $125 million per Year
Benefits Estimates

- Construction Jobs over 7 years – 26,224
- O&M Permanent Jobs – 904
- New Job Creation – 16,390
- Value of Time Savings - $35.6 million per year
- Vehicle Accident Reduction - $56.3 million per year
- Consumer Travel Savings - $42.8 million per year
Riding 220 mph Trains

Chicago-St. Louis 220 mph HSR