Agenda

• Phase I Process
  • Study Purpose, Goals, and Principles

• CONNECT
  • Tool Description

• Phase I Draft Network Overview

• Phase II Purpose
  • CONNECT Updates
    • Database Updates
    • Model Updates

• Baseline Conditions Re-Assessment
  • Database Comparison

• Next Steps
Project Team

Stakeholder Engagement
Chrissy Breit (Metro Strategies)
Mark Berndt (Quetica)

Baseline Conditions, Market Assessment, Network Design, Service Planning
Task Lead
Alexis Howland (WSP)
Brandon Williams (WSP)

Senior Strategic Advisors
Foster Nichols (WSP)
Yoav Hagler (DB Eng & Consulting)

Draft/Final Regional Rail Plan and Lessons Learned
Task Lead
Anna Lynn Smith, AICP (HDR)

Federal Railroad Administration
Lead Planner
Peter Schwartz (FRA)

Project Manager
Anna Lynn Smith, AICP (HDR)
Today’s Presenters

• Peter Schwartz, FRA Project Manager
• Anna Lynn Smith, Consultant Team Project Manager
• Yoav Hagler, Consultant Team Technical Lead
• Alexis Howland, Consultant Team Technical Lead
Phase I Process

Study Purpose, Goal, and Principles
FRA Regional Rail Planning Efforts

- Midwest Regional Rail Plan
- Southeast Regional Rail Plan
- Southwest Regional Rail Plan
Study Purpose

Advance Regional Rail Planning for the Midwest

• Engage in long-term visioning process
• Perform conceptual planning of high-performance passenger rail at the regional level
• Support National Rail Planning objectives
• Final Regional Rail Plan supports existing statewide and regional processes
  • State Rail Plans
  • Long-Range Transportation Planning
• Facilitate future planning and streamline implementation
What the Study is NOT

• DOES NOT identify specific routes or alignments for corridors that make up the network
• DOES NOT identify specific station locations
• DOES NOT come to conclusions regarding capacity or operating feasibility
• DOES NOT represent a commitment to implementing specific projects
Study Goal

Produce a 40-year framework for the Midwest intercity passenger rail network, including a prioritization of corridors and investment projects, a governance structure, and funding strategy.
Study Principles

Share Regional Network Planning Goals

1. Improve regional and intercity rail connections between small/mid-sized cities and Chicago; and among mid-sized cities within the Midwest;
2. Maximize the utility of capital investment across the full range of potential markets and passenger types;
3. Minimize the friction of passenger transfers;
4. Avoid capital investment in the short term that is inconsistent with the long-term network vision.
5. Regional and Intercity rail connections to major airports within the region are important.
6. Build toward the maximum viable service tier for corridors in network.
Study Participants
Stakeholder Planning Group

• Primary Midwest Rail Plan States (IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI)

• Other stakeholders: host and operating railroads, MIPRC, MPOs and municipalities, advocacy groups

• Complementary Jurisdictions: KY, NY (Buffalo), TN, PA (Pittsburgh), WV, Ontario
Regional Plan in Context

Midwest Regional Rail Planning Study

**Strategic Plan** – Provides Framework for Investments

- Sets service goals
- Identifies Opportunities for Network Integration

State Rail Plans

Corridor Implementation Plans
CONNECT

• Sketch planning tool originally developed in 2012 – recently updated
• Estimates the overall performance of user-defined corridors and networks
• Intended for use at the outset of the planning process
• Relies on a national trip table for markets between 50 to 850 miles apart
• Enables the user to:
  • Describe potential high-performance rail (HPR) network
  • Develop high-level service plans
  • Generate operational data
  • Estimate the financial and operational performance of the network
CONNECT Limitations

- Intentionally applies approximate and simplified methods
- Only appropriate for early-stage planning
- Not substitute for detailed corridor and network planning
- High-level service plan assumptions used
- Coarse representation of a particular rail corridor or network
- Coarse geographic representation
- Capital cost calculations consist of a very simplified costing model
- All outputs in CONNECT are presented as ranges (with low, medium, and high values)
Study Process
High-level View of Plan Process
Technical Analysis Flow Chart

Workshop #1 – March 2017, Chicago
- Assess Existing Market Data
- CONNECT Demand Calibration / Validation

Workshop #2 – June 2017, Saint Paul
- Major Market Analysis
- Define Building Blocks
- CONNECT Cost Calibration / Validation
- Run Building Block Analysis
- Clear Answers – Draft Network Elements
- Ambiguous Answers - Need Stakeholder Input

Workshop #3 – September 2017, Detroit
- Draft Network Vision
- Workshop #4 – December 2017, Chicago
- Final Network Vision
Technical Analysis Flow Chart

1. **Workshop #1** – March 2017, Chicago
   - Assess Existing Market Data
   - CONNECT Demand Calibration / Validation
   - Major Market Analysis
   - Define Building Blocks
   - CONNECT Cost Calibration / Validation

2. **Workshop #2** – June 2017, Saint Paul
   - Run Building Block Analysis
   - Ambiguous Answers - Need Stakeholder Input
   - Clear Answers – Draft Network Elements

3. **Workshop #3** – September 2017, Detroit
   - Workshop #4 – December 2017, Chicago
   - Draft Network Vision
   - Final Network Vision
Technical Analysis Flow Chart

Assess Existing Market Data → Major Market Analysis

Workshop #1 – March 2017, Chicago

Define Building Blocks → CONNECT Cost Calibration / Validation

Workshop #2 – June 2017, Saint Paul

CONNECT Demand Calibration / Validation

Run Building Block Analysis

Clear Answers – Draft Network Elements
Ambiguous Answers - Need Stakeholder Input

Workshop #3 – September 2017, Detroit

Draft Network Vision → Workshop #4 – December 2017, Chicago

Final Network Vision
Phase I Draft Network Overview
## Phase I Draft Network Overview

### Service Tiers

<table>
<thead>
<tr>
<th>Service Tier</th>
<th>Top Speeds (mph)</th>
<th>Other Common Characteristics</th>
<th>Primary Markets Served</th>
<th>Minimum Reliability Target (On-time Performance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Express Corridors</td>
<td>Over 125</td>
<td>Frequent service; dedicated tracks, except in terminal areas; electric-powered</td>
<td>Serving major metropolitan centers</td>
<td>99%</td>
</tr>
<tr>
<td>Regional Corridors</td>
<td>90-125</td>
<td>Frequent service; dedicated and shared tracks, electric- and diesel-powered</td>
<td>Connecting mid-sized urban areas with each other or with larger metropolitan areas</td>
<td>95%</td>
</tr>
<tr>
<td>Emerging/ Feeder Corridors</td>
<td>Up to 90</td>
<td>Shared tracks</td>
<td>Connecting mid-sized and smaller urban areas with each other or with larger metropolitan areas</td>
<td>85%*</td>
</tr>
<tr>
<td>Network Independent Corridors</td>
<td></td>
<td>Corridors that have minimal effect on network performance and/or where minimal ridership connects through to the rest of the network</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: FRA, High-Speed Rail in America, High-Speed Rail Strategic Plan, April 2009

*On-time performance target might increase in the future
Phase I Draft Network Overview

Corridor Categorization

• Integral to Network
  • Significantly influences ridership on other corridors.
  • Service tier and service frequency should be made in coordination with other network decisions.

• Network Independent
  • Does not significantly add ridership to connecting corridors (nor receives connecting ridership).
  • Decisions about service tier and frequency can be made independent of other network corridors.
  • May include some existing passenger service.

• Future Corridor
  • Could potentially be included in the network in future years.
  • Could provide additional internal connectivity within the network.

• Small Market
  • Relatively low ridership compared to the overall network but may still have importance to local and regional transportation needs.
Phase I Draft Network
Phase I CONNECT Base Network
Pillar Corridors
# Benefits of Connectivity (2055)

<table>
<thead>
<tr>
<th></th>
<th>Markets Served&lt;sup&gt;1&lt;/sup&gt;</th>
<th>Intercity Ridership&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Revenue</th>
<th>O&amp;M Cost</th>
<th>Capital Cost&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Standalone</td>
<td>280</td>
<td>32 M</td>
<td>$1.5 B</td>
<td>$2.5 B</td>
<td>$137 B</td>
</tr>
<tr>
<td>Network</td>
<td>1340</td>
<td>43 M</td>
<td>$2.2 B</td>
<td>$2.5 B</td>
<td>$131 B</td>
</tr>
<tr>
<td>Difference</td>
<td>379%</td>
<td>34%</td>
<td>47%</td>
<td>-3%</td>
<td>-4%</td>
</tr>
</tbody>
</table>

1. Total number of market pairs on network with maximum of one transfer.
2. Year 2055 intercity demand.
3. Nets out the capital cost associated with the existing network.
Phase I General Findings

- Network connectivity significantly enhances ridership.
- The four pillar corridors account for nearly half of all unlinked trips.
- The four pillar corridors all operate with a positive operating recovery ratio at the Regional and Core Express service levels in the Network context.
- The overall network nearly covers its operating costs.
- The non-pillar corridors help improve the viability of the pillar corridors.
- Both the Regional and Core Express networks deliver potentially viable financial performance - the Core Express network delivers more riders at a higher capital cost.
Questions?

Please type in questions in the Q&A box accessible in your Zoom panel
Phase II Purpose
Database and Model Updates

• Phase I work identified necessary updates to the CONNECT model and the underlying trip table database

• Database modifications:
  • CBSA growth rate cap modifications for horizon year estimates
  • Auto trip calculations

• CONNECT model modifications

![Database Auto Trip Volumes](image)
Phase II Purpose

Based on the CONNECT updates, phase II will:

• Analyze how the baseline conditions and major market assessment changes with the updated auto trip tables
  • The auto trip tables are the basis for estimating rail ridership within CONNECT. Changes to the auto trips will impact rail ridership.

• Examine how the previously proposed regional network performs in the new model with the new database.

• Determine what, if any, changes should be made to the proposed network based on the updated database.
Baseline Conditions
Phase I and Phase II
CBSA Populations Ranked – 2015

Source: US Census Bureau 2015
CBSA Locations
Top Air Markets – 2015

Phase I & Phase II

### Annual Trips
- **150,000-199,999**
- **200,000-499,999**
- **500,000-749,999**
- **750,000-999,999**
- **>1,000,000**

**Source:** CONNECT Analysis
Top Rail Markets – 2015

- Chicago - Milwaukee
- Chicago - St. Louis
- Chicago - Detroit
- Kansas City - St. Louis
- Chicago - Grand Rapids
- Chicago - Kansas City
- Chicago - Pittsburgh
- Chicago - Minneapolis/St. Paul
- Chicago - Indianapolis
- Chicago - Cleveland
- Chicago - Memphis
- Buffalo - Chicago
- Chicago - Toledo
- Chicago - Madison
- Chicago - Omaha

Phase I & Phase II

Chicago to Major City
Chicago to Regional City
Major City to Major City
Major City to Regional City
Top Rail Markets – 2015

Phase I & Phase II

Source: CONNECT Analysis
1. For CBSAs over 50 miles apart
### Top Auto Markets¹ – 2015

1. For CBSAs over 50 miles apart

<table>
<thead>
<tr>
<th>Route</th>
<th>Phase II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago - Milwaukee</td>
<td>8 mil</td>
</tr>
<tr>
<td>Chicago - Detroit</td>
<td>5 mil</td>
</tr>
<tr>
<td>Chicago - Indianapolis</td>
<td>4 mil</td>
</tr>
<tr>
<td>Chicago - St. Louis</td>
<td>3 mil</td>
</tr>
<tr>
<td>Chicago - Minneapolis/St. Paul</td>
<td>2 mil</td>
</tr>
<tr>
<td>Chicago - Cincinnati</td>
<td>2 mil</td>
</tr>
<tr>
<td>Chicago - Cleveland</td>
<td>2 mil</td>
</tr>
<tr>
<td>Chicago - Grand Rapids</td>
<td>2 mil</td>
</tr>
<tr>
<td>Cleveland - Detroit</td>
<td>1 mil</td>
</tr>
<tr>
<td>Chicago - Columbus</td>
<td>1 mil</td>
</tr>
<tr>
<td>Chicago - Pittsburgh</td>
<td>1 mil</td>
</tr>
<tr>
<td>Columbus - Detroit</td>
<td>1 mil</td>
</tr>
<tr>
<td>Cincinnati - Columbus</td>
<td>1 mil</td>
</tr>
</tbody>
</table>

¹ Phase II includes Chicago to Major City, Chicago to Regional City, Major City to Major City, and Major City to Regional City.
Top Auto Markets – 2015

Phase I

Annual Trips
- 150,000-1,999,999
- 2,000,000-3,999,999
- 4,000,000-5,999,999
- 6,000,000-7,999,999
- >8,000,000

Source: CONNECT Analysis
Top Auto Markets – 2015

Phase II

Source: CONNECT Analysis
## Top Travel Markets: All Modes – 2015

### Phase I  Top 5 Travel Pairs by Mode

<table>
<thead>
<tr>
<th>Rank</th>
<th>Auto</th>
<th>Air</th>
<th>Rail*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chicago - Milwaukee</td>
<td>Chicago - Minneapolis/St. Paul</td>
<td>Chicago - Milwaukee</td>
</tr>
<tr>
<td>2</td>
<td>Chicago - St. Louis</td>
<td>Chicago - Kansas City</td>
<td>Chicago - St. Louis</td>
</tr>
<tr>
<td>3</td>
<td>Chicago - Detroit</td>
<td>Chicago - Detroit</td>
<td>Chicago - Detroit</td>
</tr>
<tr>
<td>4</td>
<td>Chicago - Indianapolis</td>
<td>Chicago - St. Louis</td>
<td>Kansas City - St. Louis</td>
</tr>
<tr>
<td>5</td>
<td>Cincinnati - Dayton</td>
<td>Chicago - Nashville</td>
<td>Chicago - Grand Rapids</td>
</tr>
</tbody>
</table>

### Phase II  Top 5 Travel Pairs by Mode

<table>
<thead>
<tr>
<th>Rank</th>
<th>Auto</th>
<th>Air</th>
<th>Rail*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chicago - Milwaukee</td>
<td>Chicago – Minneapolis/St. Paul</td>
<td>Chicago - Milwaukee</td>
</tr>
<tr>
<td>2</td>
<td>Chicago - Detroit</td>
<td>Chicago – Kansas City</td>
<td>Chicago - St. Louis</td>
</tr>
<tr>
<td>3</td>
<td>Chicago - Indianapolis</td>
<td>Chicago – Detroit</td>
<td>Chicago - Detroit</td>
</tr>
<tr>
<td>4</td>
<td>Chicago – St. Louis</td>
<td>Chicago – St. Louis</td>
<td>Kansas City - St. Louis</td>
</tr>
<tr>
<td>5</td>
<td>Chicago – Minneapolis/St. Paul</td>
<td>Chicago – Nashville</td>
<td>Chicago - Grand Rapids</td>
</tr>
</tbody>
</table>
Top Auto Markets – 2055

Phase I Auto Trip Growth for Same Top Market Pairs

- Chicago - Milwaukee
- Chicago - St. Louis
- Chicago - Detroit
- Chicago - Indianapolis
- Detroit - Toledo
- Cincinnati - Columbus
- Chicago - Madison
- Cincinnati - Indianapolis
- Chicago - Cincinnati
- Cleveland - Detroit
- Chicago - Grand Rapids
- Cleveland - Pittsburgh
- Columbus - Detroit

Chicago to Major City
Chicago to Regional City
Major City to Major City
Major City to Regional City

% Growth from 2015 to 2055

- Chicago to Major City
- Chicago to Regional City
- Major City to Major City
- Major City to Regional City

- 28.7 million
- 12.5 million
- 12.1 million

Columbus - Detroit
Cleveland - Pittsburgh
Chicago - Grand Rapids
Chicago - Cincinnati
Cincinnati - Indianapolis
Chicago - Madison
Cincinnati - Columbus
Detroit - Toledo
Chicago - Indianapolis
Chicago - St. Louis
Chicago - Milwaukee

47
Top Auto Markets – 2055

Phase II  Auto Trip Growth for Same Top Market Pairs

<table>
<thead>
<tr>
<th>Market Pairs</th>
<th>1 mil</th>
<th>2 mil</th>
<th>3 mil</th>
<th>4 mil</th>
<th>5 mil</th>
<th>6 mil</th>
<th>7 mil</th>
<th>8 mil</th>
<th>9 mil</th>
<th>10 mil</th>
<th>% Growth from 2015 to 2055</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago - Milwaukee</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>56%</td>
<td></td>
</tr>
<tr>
<td>Chicago - Detroit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Indianapolis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - St. Louis</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>226%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Minneapolis/St. Paul</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Cincinnati</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Cleveland</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>226%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Grand Rapids</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>51%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cleveland - Detroit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Columbus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicago - Pittsburgh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Columbus - Detroit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cincinnati - Columbus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>66%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
CONNECT Base Network
# Auto Trips – 2055

Representative CBSA Pair Auto Trip Volumes in Phase I & Phase II

<table>
<thead>
<tr>
<th>Corridor</th>
<th>CBSA Pair</th>
<th>Phase I Auto Trips</th>
<th>Phase II Auto Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHI-MSP</td>
<td>Chicago - Milwaukee</td>
<td>-76%</td>
<td></td>
</tr>
<tr>
<td>MKE-GBY</td>
<td>Green Bay - Milwaukee</td>
<td>-74%</td>
<td></td>
</tr>
<tr>
<td>IND-COL</td>
<td>Columbus - Indianapolis</td>
<td>-39%</td>
<td>-76%</td>
</tr>
<tr>
<td>CDL-OMA</td>
<td>Champaign/Urbana - Chicago</td>
<td>-91%</td>
<td></td>
</tr>
<tr>
<td>CHI-STL</td>
<td>Bloomington - Chicago</td>
<td>-87%</td>
<td></td>
</tr>
<tr>
<td>STL-KSC</td>
<td>Kansas City - St. Louis</td>
<td>-44%</td>
<td>-87%</td>
</tr>
<tr>
<td>DVP-CHM</td>
<td>Champaign/Urbana - Peoria</td>
<td>-59%</td>
<td></td>
</tr>
<tr>
<td>CHI-IND</td>
<td>Chicago - Indianapolis</td>
<td>-55%</td>
<td></td>
</tr>
<tr>
<td>IND-NVL</td>
<td>Indianapolis - Louisville</td>
<td></td>
<td>-57%</td>
</tr>
<tr>
<td>CIN-CLE</td>
<td>Cincinnati - Columbus</td>
<td>-57%</td>
<td></td>
</tr>
<tr>
<td>CHI-COL</td>
<td>Chicago - Fort Wayne</td>
<td>-63%</td>
<td></td>
</tr>
<tr>
<td>TOR-PGH</td>
<td>Detroit - Toledo</td>
<td>-73%</td>
<td></td>
</tr>
<tr>
<td>CHI-CLE</td>
<td>Chicago - Toledo</td>
<td>-69%</td>
<td></td>
</tr>
<tr>
<td>CHI-DET</td>
<td>Chicago - Detroit</td>
<td>-57%</td>
<td></td>
</tr>
<tr>
<td>KAL-ARB</td>
<td>Grand Rapids - Lansing</td>
<td>-80%</td>
<td></td>
</tr>
</tbody>
</table>
Next Steps

• Test how the previously proposed network performs with the new database
• Determine if any changes need to be made to the network
  • Initial findings indicate changes will need to be made
• New network options will be examined
  • Optimized Recovery Ratio Network with cost recovery greater than 1.0
  • Network that mimics capital cost from Phase I
  • Network that mimics current state support
  • Network that matches operating recovery ratio from Phase I
  • Optimized network based on Net Present Value, Transportation Efficiency, and other analyses
• Additional Stakeholder Meeting(s) to incorporate feedback on network options
  • In-person stakeholder meeting is planned, date TBD
Questions?

Please type in questions in the Q&A box or raise hand to ask question over audio
Contact

Peter Schwartz
Federal Railroad Administration Project Manager
(202) 493-6360
Peter.Schwartz@dot.gov

Anna Lynn Smith
Consultant Team Project Manager
(215) 845-6710
annalynn.smith@hdrinc.com