Houston Region
Freight Study

July 23, 2007
Regional Setting
Purpose of the Study

• Analyze freight movement (truck and rail) within the Houston region
• Identify a slate of improvements for consideration
  – Develop estimated costs and implementation timeframes (short, medium, and long-range)
  – Estimate associated private and public benefits
    • Reduced vehicular delay at roadway-railroad crossings
    • Reduced emissions at roadway-railroad crossings
    • Improved safety at roadway-railroad crossings
    • Improved operating efficiency of railroads
Historical Perspective

• Houston Rail Network
  – 11 Railroads
  – Built in the late 1800’s

• Primary Operating Railroads
  – Union Pacific Railroad (UPRR)
  – BNSF Railway (BNSF)
  – Port Terminal Railroad Association (PTRA)
    ▪ Partnership between UPRR, BNSF, and Kansas City Southern (KCS)
Existing Rail Network

- 2,200 trains per week
- 800 miles of mainline track
- 21 miles of railroad bridges
- Approx. 1,200 at-grade roadway-railroad crossings
Freight Rail Operations

- Almost half of all trains in the Houston network are local trains and yard engines.

- Less than 5 percent of trains operate completely through the region without stopping in Houston.

- The railroads provide service to more than 900 customers in the Houston region.
Identified Potential Improvements

• Grade Separations ($808 million)
  – Bridges to separate the railroad from streets

• Grade Crossing Closures ($5.2 million)
  – Closing and rerouting the street at the intersection with the railroad

• Improvements to Existing Railroad Infrastructure ($1.4 billion)
  – Improving capacity and connectivity on existing rail lines

• New Railroad Corridors ($1.1 billion)

• Total estimated cost of improvements: $3.4 billion
Grade Separations

• 55 identified grade separations
  – Estimated cost: $808 million
  – Estimated public benefit: $730 million
    ▪ Reduced safety hazards, delays, and emissions
Grade Separations
Inside 610 Loop
## Public Benefits – Grade Separations

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Railroad Subdivision</th>
<th>AADT</th>
<th>Estimated Cost</th>
<th>Estimated 20-year Public Benefit</th>
<th>Ratio: Benefit/Cost</th>
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<tbody>
<tr>
<td>Quitman</td>
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<td>7,800</td>
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Crossing Closures and Pedestrian Bridges

• 63 identified crossing closures
  – Estimated cost: $5.2 million
  – Estimated public benefit: $98 million
    ▪ Reduced safety hazards and delays
    ▪ Encourage motorists to use grade separated crossings

• 5 pedestrian bridges
Crossing Closures
Inside 610 Loop
## Public Benefits – Crossing Closures

<table>
<thead>
<tr>
<th>Street Name</th>
<th>Railroad Subdivision</th>
<th>AADT</th>
<th>Estimated Cost</th>
<th>Estimated 20-year Public Benefit</th>
<th>Ratio: Benefit/Cost</th>
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</table>
Public Benefits Calculations

- Net Present Value for 10 and 20 years worth of “savings” derived from:
  - NOx reductions from locomotives
  - Vehicle delays at grade crossings
  - Automotive emissions
  - Time of day vehicle/rail interface
  - Safety statistics

- Included growth forecasts for vehicular and train traffic

INPUTS:
- Roadway Traffic
- Time of Day, Traffic Volume, Vehicle Mix
- Railroad Traffic
- Time of Day, Train Speed, Train Length

Houston Area Grade Crossing Records

Output ($)

Costs for:
- Delay
- Emissions
- Fuel
- Collisions

OUTPUTS:
Rail Constraints

- Limited capacity growth
- Restricted right-of-way
- Lack of connectivity
- Constricted yards and terminals
Railroad Improvements

- Increase rail line segment train speeds
- Overall movement of trains
- Fluidity of movements into and out of yards
- Reduction of bottlenecks
Rail Improvements

- 33 rail capacity improvements
  - Estimated cost: $1.4 billion
    - Adding a mainline track
    - Adding track adjacent to mainlines at strategic locations to allow trains to pass one another
    - Constructing connections from one rail line to another
    - Expanding rail yard capacity
    - Crossing gate/signal improvements

- 2 rail relocation alternatives (new rail corridors)
  - Estimated cost: $1.1 billion
AVERAGE WEEKLY TRAIN COUNTS
SEPARATE SWITCHING LEADS AT SETTEGAST

SEPARATE SWITCHING LEAD BETWEEN NORTH YARD AND HUNTING BAYOU

NEW BRIDGE AT BUFFALO BAYOU FOR SECOND MAIN TRACK

SECOND MAIN TRACK BETWEEN SINCO JUNCTION AND MANCHESTER JUNCTION

SECOND MAIN TRACK BETWEEN SINCO JUNCTION AND DEER PARK JUNCTION

PLANNING CASE 1
SECOND MAIN TRACK BETWEEN ROSENBERG AND WEST JUNCTION

EXTENSION OF WEST BELT MAIN TRACK 2 NORTH FROM FREIGHT JUNCTION THROUGH BELT JUNCTION INTERLOCKING PLANT

REMOVE TRAIN STOPPING REQUIREMENTS ON WEST BELT SUBDIVISION FROM CULLEN BLVD TO NORTH TO TOWER 26

EXPAND ENGLEWOOD YARD TRACK EAST TO FAUNA

EXTENSION OF EXISTING SECOND MAIN TRACK EAST FROM DAWES TO FAUNA AND UPGRADE THE TRACK CONNECTING THE EAST BELT SUB TO THE LAFAYETTE SUB

PLANNING CASE 2
PLANNING CASE 3
CHANGE IN WEEKLY TRAIN COUNT

FORT BEND BYPASS

-150
+125
-125
+150
PLANNING CASE 3
WEEKLY TRAIN COUNT
EASTBOUND BYPASS TRAINS

LEGEND
- RAILROAD TOWER
- RAIL YARD
- RAILROAD JUNCTION
- UNION PACIFIC RAILROAD
- INSP RAILROAD
- HMT RAILROAD
- PORT TERMINAL RAILROAD
- ABANDONED RAIL LINES

FORT BEND BYPASS

53
59
6
32
21
6
PLANNING CASE 3
WEEKLY TRAIN COUNT
WESTBOUND BYPASS TRAINS
PLANNING CASE 4
CHANGE IN WEEKLY TRAIN COUNT
Potential Yard Relocations

- Consolidate Intermodal Facilities
  - Englewood, Settegast
    - Possible relocation of Englewood Intermodal operations

- BNSF Car Loading operations
  - Pearland
    - New South Yard
## Private and Public Benefits - Planning Cases (Railroad Improvements)

<table>
<thead>
<tr>
<th></th>
<th>Planning Case 1</th>
<th>Planning Case 2</th>
<th>Planning Case 3</th>
<th>Planning Case 4</th>
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<tbody>
<tr>
<td><strong>Total Estimated Cost</strong>*</td>
<td>$92,000,000</td>
<td>$331,000,000</td>
<td>$1,080,000,000</td>
<td>$542,000,000</td>
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<tr>
<td><strong>Total Estimated NPV Private Benefit (over Base Case)</strong></td>
<td>$48,000,000</td>
<td>$73,000,000</td>
<td>$(63,000,000)</td>
<td>$76,000,000</td>
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<tr>
<td><strong>Total Estimated NPV Public Benefit (over Base Case)</strong></td>
<td>$73,000,000</td>
<td>$98,000,000</td>
<td>$634,000,000</td>
<td>$131,000,000</td>
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<tr>
<td><strong>Benefit (Private + Public)/Cost Ratio</strong></td>
<td>1.3</td>
<td>0.5</td>
<td>0.5</td>
<td>0.4</td>
</tr>
</tbody>
</table>

*Planning case costs are cumulative and rounded up to three significant figures. For example, Planning Case 3 costs include the costs of Planning Case 1 and 2 improvements.*

**Estimated private and public benefits shown are based on a 20-year study period.*
Public Involvement

- More detailed information can be found at:  
  - www.houstonrailplan.com

- Updated information is posted regularly

- Website will be maintained through 2007

- Comments welcome
Next Steps

• Evaluation of public comments

• Report submitted to TxDOT

• Big Picture report that is a needs assessment
  – Texas Legislature

• Improvements identified are NOT recommended projects
  – Project milestones
  – Funding