Today’s presentation

• History of the project
• Findings Phases 1 and 2
• Next steps
  • Decisions, directions, action plans
History of the Project

- 2005 - CEOs meeting at INDOT
  - Missouri, Illinois, Indiana, Ohio and others
  - Shared congestion problems
  - Interest in evaluating concept of DTLs

- 2007 - Indiana led 4-state coalition application for FHWA “Corridor of the Future” designation
  - One of 6 corridors designated
  - Received funds under separate application
History of the Project

- **Jan 2009:**
  - 4 states signed Development Agreement with USDOT
  - MOU under the COF program authorized
  - “..study, plan, develop, finance, construct, operate and maintain the I-70 Corridor as a unified facility.”

- **Spring 2009:** I-70 Study initiated
  - Phase 1: Evaluate big picture/business case for DLTs
  - Phase 2: Evaluate and strengthen business case findings from Phase 1, and recommendations to move DTL concept to reality
Study Hypotheses

Dedicated Truck Lanes will:

- address congestion and safety problems and needs on the corridor
- improve the regions’ economic competitiveness
- more than
  - general purpose lanes capacity additions
  - maintaining the corridor as it is today
Phase 1

- Define “business case”
- Develop a range of scenarios
- Establishing performance measures
- Collecting and analyzing all stakeholder perspectives
- Commodity flows & resultant freight traffic
- Clarifying finance options
Phase 1 = Business Case

- The need and demand for dedicated truck lanes
- Whether state and federal investments in dedicated truck lanes are justified

\[
\text{Cost to Construct, Operate and Maintain} \leq \text{Return on Investment + Cost Avoidance}
\]

\[
(CC + CO + CM) \leq (ROI + CA)
\]
Phase 1 Evaluation criteria

1. Safety
2. Freight Movement Productivity
3. Cost and Financial Feasibility
4. Economic Benefit
5. Stakeholder Acceptance
6. Technology Integration / Security
7. Pavement Life Cycle
8. Other Incentives and Amenities
9. Environmental Impact
10. Political / Legislative
11. Intermodal Connectivity
Phase 1 Findings

Daily Regional I-70 Truck Trips by Distance (2030)

<table>
<thead>
<tr>
<th>Miles</th>
<th>Daily Regional Trucks</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 100</td>
<td>5,000</td>
</tr>
<tr>
<td>&lt; 200</td>
<td>30,000</td>
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<tr>
<td>&lt; 700</td>
<td>2,500</td>
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<tr>
<td>&lt; 800</td>
<td>1,000</td>
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</table>

Trip Purpose CV’s on I-70 Study Area

<table>
<thead>
<tr>
<th>Trip Purpose</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local pickups and deliveries (less than 100 miles)</td>
<td>24%</td>
</tr>
<tr>
<td>Regional (100 to 499 miles)</td>
<td>33%</td>
</tr>
<tr>
<td>Inter-regional (500 to 999 miles)</td>
<td>28%</td>
</tr>
<tr>
<td>National (1,000 or more miles)</td>
<td>15%</td>
</tr>
</tbody>
</table>
Modal Connectivity – Air and water ports

Ex. Truck – Air Cargo
Truck to rail connectivity at corridor terminus

All corridor service on trucks
Environmental Red Flag Assessment

- Are there corridor-wide environmental benefits or concerns to constructing DTLs?
  - Air quality and carbon emissions footprint
  - Noise
  - Environmental Justice
  - Secondary and cumulative impacts
Is there a business Case for DTL?

40 Year Return on Investment

<table>
<thead>
<tr>
<th>$ Millions</th>
<th>Econ. Output</th>
<th>Safety</th>
<th>Tolls</th>
<th>No-build</th>
<th>Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50,000</td>
<td></td>
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<td>100,000</td>
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<tr>
<td>250,000</td>
<td></td>
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</tr>
</tbody>
</table>

Econ: Economic Output
Safety: Safety
Tolls: Tolls
No-build: No Build
Build: Build

Construction, Operation, & Maintenance
Phase 1 Findings

Business Case for DTLs on I-70

40 Year Cost Avoidance & Return on Investment (2015 - 2055) in 2010 Dollars

<table>
<thead>
<tr>
<th>CA &amp; ROI</th>
<th>DTL Total Costs (build, operate, maintain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$32.3</td>
<td>$50.0</td>
</tr>
<tr>
<td>$10.6</td>
<td></td>
</tr>
<tr>
<td>$32.0</td>
<td></td>
</tr>
<tr>
<td>$2.5</td>
<td></td>
</tr>
</tbody>
</table>

$32.3 + $10.6 + $32.0 + $2.5 ≤  $50.0

- Build Costs & Operations
- CA (as is costs w/o DTLs)
- Optional Toll Revenues
- Safety Cost Reduction ($2.5 - $3.3 Billion)
- Increased Economic Output (Benefits 2011-2030)

(CC + CO + CM) ≤ (ROI + CA)
Phase 2

- Refine scenarios
- Refine analysis
- Reduced evaluation criteria to 5
- Re-evaluated
  - Identify risks
  - Funding and financing
- Determine actions needed to advance
Literature review findings

- No other studies/projects like this – most shorter
- Most evaluated safety, congestion, truck volumes
- Feasibly is different in rural vs urban areas
- Tolling in nearly every study
- Cost is major issue
- Economic and financial feasibility are different and should be evaluated independently
Phase 2 Evaluation factors:

1. Congestion
2. Safety
3. Job creation
4. Costs
5. Carbon footprint
# Scenarios Evaluated in Phase 2

<table>
<thead>
<tr>
<th>Scenario</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>No-Build&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Build&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Build Four DTL’s</td>
<td>Build DTL’s (4 lanes rural, 2 lanes urban)</td>
</tr>
<tr>
<td>Add capacity to general purpose lanes</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Number of DTL Lanes in each direction</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Truck interchanges (grade separated/slip ramps)</td>
<td></td>
<td></td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Physically separate the lanes with barriers and medians</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Number of DTL Lanes in each direction</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Number of separated truck interchanges</td>
<td></td>
<td></td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Physically separate the lanes with concrete barriers and shoulders</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>HPV Staging Area</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

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**Lane Miles of I-70 Improvements**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Lane Miles</th>
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<tbody>
<tr>
<td>Scenario 1</td>
<td>38 lane miles</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>122 lane miles</td>
</tr>
<tr>
<td>Scenario 3A</td>
<td>3,106 lane miles</td>
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<tr>
<td>Scenario 3B</td>
<td>3,106 lane miles</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>2,969 lane miles</td>
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</tbody>
</table>
Rural Typical Sections for Scenarios 1 and 2

Urban Typical Sections for Scenarios 1 and 2
(In some locations Scenario 2 has more lanes due to LRTP projects)
Rural Typical Sections for Scenarios 3 and 4
(Also used for HPV configuration analysis)

Urban Typical Sections for Scenario 3
Urban Typical Sections for Scenario 4
(Also used for single HPV Lane analysis - with technology e.g. automated guidance)
Corridor Traffic, Congestion
### 2030 Eastbound

<table>
<thead>
<tr>
<th>Location</th>
<th># Vehicles</th>
<th>between STL</th>
<th>between I-57</th>
<th>between INDY</th>
<th>between I-75</th>
<th>between COL</th>
<th>between East of DTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>KC &amp; West</td>
<td>7,454</td>
<td>2,825</td>
<td>2,566</td>
<td>2</td>
<td>16</td>
<td>44</td>
<td>334</td>
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<td>between</td>
<td>4,550</td>
<td>-</td>
<td>4,194</td>
<td>13</td>
<td>15</td>
<td>19</td>
<td>61</td>
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<tr>
<td>STL</td>
<td>4,778</td>
<td>-</td>
<td>752</td>
<td>209</td>
<td>272</td>
<td>512</td>
<td>47</td>
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<tr>
<td>between</td>
<td>137</td>
<td>-</td>
<td>44</td>
<td>9</td>
<td>12</td>
<td>0</td>
<td>4</td>
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<tr>
<td>I-57</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>395</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,032</td>
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<tr>
<td>INDY</td>
<td>9,391</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1,459</td>
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<td>-</td>
<td>-</td>
<td>136</td>
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<tr>
<td>I-75</td>
<td>1,611</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>459</td>
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<td>between</td>
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<td>-</td>
<td>-</td>
<td>412</td>
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<td>COL</td>
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<td>-</td>
<td>-</td>
<td>931</td>
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<tr>
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<td>2,349</td>
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</table>

**Total:** 40,553

### 2030 Westbound

<table>
<thead>
<tr>
<th>Location</th>
<th># Vehicles</th>
<th>between COL</th>
<th>between I-75</th>
<th>between INDY</th>
<th>between I-75</th>
<th>between STL</th>
<th>between KC &amp; West</th>
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</thead>
<tbody>
<tr>
<td>East of DTL</td>
<td>6,734</td>
<td>1,129</td>
<td>2,361</td>
<td>76</td>
<td>256</td>
<td>193</td>
<td>772</td>
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<td>4,242</td>
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<td>2,342</td>
<td>141</td>
<td>441</td>
<td>158</td>
<td>933</td>
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<tr>
<td>COL</td>
<td>10,518</td>
<td>-</td>
<td>408</td>
<td>455</td>
<td>452</td>
<td>452</td>
<td>5,400</td>
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<td>between</td>
<td>1,020</td>
<td>-</td>
<td>-</td>
<td>480</td>
<td>100</td>
<td>327</td>
<td>11</td>
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<tr>
<td>I-75</td>
<td>1,113</td>
<td>-</td>
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<td>-</td>
<td>135</td>
<td>331</td>
<td>81</td>
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<td>between</td>
<td>1,664</td>
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<td>-</td>
<td>1,458</td>
<td>74</td>
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<td>INDY</td>
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<td>2,333</td>
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<td>395</td>
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<tr>
<td>I-57</td>
<td>284</td>
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<tr>
<td>STL</td>
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<td>4,193</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2,825</td>
</tr>
</tbody>
</table>

**Total:** 40,597

First Enter I-70 in # Vehicles Leave I-70 in

**First Enter I-70 in # Vehicles Leave I-70 in**
Total Regional I-70 Truck Growth - (2015 to 2030)
- Truck growth projections: 1.7% to 3.7%.
- Passenger vehicle growth projections: 1.8% to 2.5%.
- Trucks are anticipated to grow faster initially, then grow at a comparable rate to passenger vehicles.
Top 5 Regional I-70 Truck Markets by Direction (2030)
7,454 Trips First Enter I-70 in KC & West

2030 Model Results
Trips First Entering I-70 in KC & West (EB Direction)
2030 Model Results
Trips First Entering I-70 in STL (EB Direction)

4,778 Trips First Enter I-70 in STL
2,351 Trips First Enter I-70 in I-57

2030 Model Results
Trips First Entering I-70 in I-57 (EB Direction)
9,391 Trips First Enter I-70 in IND

2030 Model Results
Trips First Entering I-70 in IND (EB Direction)
2030 Model Results
Trips First Entering I-70 in COL (EB Direction)

4,786 Trips First Enter I-70 in COL
2030 Model Results
Trips First Entering I-70 East of DTL (WB Direction)

6,734 Trips First Enter I-70 East of DTL
2030 Model Results
Trips First Entering I-70 in COL (WB Direction)

10,518 Trips First Enter I-70 in COL
6,782 Trips First Enter I-70 in STL
Largest Regional I-70 Truck Trip Markets

For trucks that would use DTLs, the top three markets are between:

1. Indianapolis and Columbus
2. Kansas City and St. Louis
3. Columbus and east of the corridor
- 69% of the I-70 truck trips are 200 miles or less
- 82% of the I-70 truck trips are 300 miles or less
50% of the freight moving on the corridor are “internal movements” remaining within the 4 Coalition states.

Many of the top commodities for each type of directional movement “weigh-out” versus “cube out.”
- Gravel, the top commodity by weight for all directional movement is an example of this condition.
By 2025, congestion emerges in urban and rural areas.

DTLs reduce congestion where they are implemented; though not always to LOS D or better.
- Future No-Build - 70% of corridor is anticipated to be congested in 2045
- 1/2 of expected congestion in 2045 eliminated with DTLs
- Greater than 97% of DTLs will be uncongested in 2045
- DTLs provide corridor travel reliability
Safety
- I-70 crash rate for trucks in congested conditions is 3.5X greater than passenger vehicles
- DTLs reduce total annual crashes by 1/3
- DTLs reduce crashes in the general purpose lanes by 50%.
- DTLs reduce fatal crashes by nearly 2/3
Crashes on corridor (2045)
Compared to Scenario 1 No-Build

- Scenario 2
  - 200 annual crashes reduced = 1% reduction
- Scenario 3A
  - 8,800 annual crashes reduced = 29% reduction
- Scenario
  - 11,000 annual crashes reduced = 36% reduction
- Scenario 4
  - 10,300 annual crashes reduced = 34% reduction

DTLs reduce crashes by 1/3
Crashes on GPLs (2045) Compared to Scenario 1 No-Build

- Scenario 2
  - 200 annual crashes reduced = 1% reduction
- Scenario 3A
  - 16,000 annual crashes reduced = 52% reduction
- Scenario
  - 16,000 annual crashes reduced = 52% reduction
- Scenario 4
  - 15,000 annual crashes reduced = 49% reduction

DTLs reduce crashes by 1/2
Fatalities
Compared to Scenario 1 No-Build

- Scenario 2
  - 4 annual fatalities reduced = 2% reduction.
- Scenario 3A
  - 135 annual fatalities reduced = 65% reduction
- Scenario
  - 135 annual fatalities reduced = 65% reduction
- Scenario 4
  - 127 annual fatalities reduced = 61% reduction

DTLs reduce fatalities by 2/3
98% of fatalities involving trucks occur in the passenger vehicles

Fatal crash rates for trucks in congested conditions is > 5 times that of passenger vehicles in congested conditions
Benefits are comprised of reductions in travel time, vehicle operating cost and crash reduction.

Compared to No-Build, DTLs provide 6X more benefit than adding GP lanes per LRTPs.

When HPVs included with DTLs, even greater benefit realized.
Tolling diverts 10% passenger vehicles and up to 50% trucks.

As diversion increases, so do user benefits for I-70 corridor.

Not the whole story – diversion has negative effects on other corridors. Fewer vehicles served on I-70
Higher Productivity Vehicles (HPVs)
I-70 Dedicated Truck Lanes Feasibility Study

HPV Analysis

High Productivity Vehicle (HPV) Configurations

- 5-Axle tractor-semitrailer
- STAA Double
- 6-Axle tractor-semitrailer, 92,000 GVW
- Rocky Mountain Double
- Triples

Standard Vehicle Configurations
The HPV scenario showed significant reductions in both fuel consumed and total emissions.

- Total fuel consumption to move the same quantity of freight decreases by 13%.
- This HPV scenario also showed reductions of 13% in emissions for CO2, NOx and PM.
Air Quality / Carbon Footprint
Air Quality – National Benefits

- **National Emissions Decrease**
  - By 2045, total nationwide emissions decrease for all build alternatives
  - Removing trucks from traffic (& allowing HPVs) reduces emissions
  - Emissions reductions grow over time
  - Greatest air quality benefits from I-70 DTLs would accrue along competing corridors such as in Chicago and Cleveland along I-80

### Relative Change in National Emissions for DTL Alternatives versus No-Build: 2045

<table>
<thead>
<tr>
<th></th>
<th>NOx</th>
<th>SO2</th>
<th>VOC</th>
<th>PM2</th>
<th>CO2</th>
<th>VMT</th>
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</thead>
<tbody>
<tr>
<td>3A</td>
<td>-0.01%</td>
<td>-0.11%</td>
<td>-1.78%</td>
<td>-0.31%</td>
<td>-0.05%</td>
<td>0.18%</td>
</tr>
<tr>
<td>3B</td>
<td>-0.58%</td>
<td>-0.68%</td>
<td>-2.19%</td>
<td>-0.83%</td>
<td>-0.62%</td>
<td>-0.52%</td>
</tr>
<tr>
<td>4</td>
<td>-0.57%</td>
<td>-0.66%</td>
<td>-1.97%</td>
<td>-0.81%</td>
<td>-0.61%</td>
<td>-0.54%</td>
</tr>
</tbody>
</table>
Air Quality – Local Impacts

- Emissions Along I-70 Increase
  - Largest increases in rural areas
  - But urban areas may face difficulty with conformity
  - Largest impact: NO\textsubscript{X}
  - Exception: VOCs, local benefits
  - May need to shift SIP budgets within the states
  - Mitigation may also be needed
  - Detailed conformity analyses would be necessary in NEPA for each urban area

![Change in CO\textsubscript{2} Emissions for DTL Alternatives vs. No-Build](chart)

- 2045
- 3A vs 1
- 3B vs 1
- 4 vs 1

<table>
<thead>
<tr>
<th>Million Tons per Year</th>
<th>I-70 Urban</th>
<th>I-70 Rural</th>
<th>Rest of US</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>3A vs 1</td>
<td>2</td>
<td>-1</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>3B vs 1</td>
<td>1</td>
<td>-2</td>
<td>-3</td>
<td>-3</td>
</tr>
<tr>
<td>4 vs 1</td>
<td>0</td>
<td>-1</td>
<td>-3</td>
<td>-3</td>
</tr>
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</table>
Jobs and economic benefits
## Findings - Summary Phase 1

**Note:** Select year snapshots; economic output is rounded to nearest: $10m, and employment is rounded to the nearest: 10

### Economic Output (in millions of 2010$)

<table>
<thead>
<tr>
<th>Impact Type</th>
<th>2011</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2011-2030</th>
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<tbody>
<tr>
<td>DTL Tolling</td>
<td>$</td>
<td>-</td>
<td>$ (240)</td>
<td>$ (320)</td>
<td>$ (400)</td>
<td>$ (480)</td>
</tr>
<tr>
<td>Construction and O&amp;M</td>
<td>$ 8,310</td>
<td>$ (430)</td>
<td>$ (150)</td>
<td>$ (150)</td>
<td>$ (150)</td>
<td>$ 29,430</td>
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<tr>
<td>Travel Efficiencies</td>
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<td>$ 650</td>
<td>$ 710</td>
<td>$ 780</td>
<td>$ 860</td>
</tr>
<tr>
<td>Total</td>
<td>$ 8,310</td>
<td>$ (20)</td>
<td>$ 240</td>
<td>$ 230</td>
<td>$ 230</td>
<td>$ 35,690</td>
</tr>
</tbody>
</table>

### Employment (in job-years)

<table>
<thead>
<tr>
<th>Impact Type</th>
<th>2011</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2011-2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTL Tolling</td>
<td>0</td>
<td>(1,230)</td>
<td>(1,660)</td>
<td>(2,090)</td>
<td>(2,520)</td>
<td>(29,970)</td>
</tr>
<tr>
<td>Construction and O&amp;M</td>
<td>59,770</td>
<td>(3,130)</td>
<td>(1,100)</td>
<td>(1,100)</td>
<td>(1,100)</td>
<td>211,310</td>
</tr>
<tr>
<td>Travel Efficiencies</td>
<td>0</td>
<td>4,120</td>
<td>4,540</td>
<td>5,000</td>
<td>5,500</td>
<td>76,490</td>
</tr>
<tr>
<td>Total</td>
<td>59,770</td>
<td>(240)</td>
<td>1,780</td>
<td>1,810</td>
<td>1,880</td>
<td>257,830</td>
</tr>
</tbody>
</table>

**$36 billion outputs**

**258,000 jobs**
Analysis based on Tredis® model
Job creation – Phase 2 approach

- $1 billion in government spending creates
  - 1,085.4 job years of employment

- $92,136 government spending
  - needed to create 1 job-year
    - 64% of job years represent direct and indirect effects
    - 36% of the job years are induced effects

- NOTE: During the Bush years estimates were provided saying that $1 billion in highway spending supports 34,779 jobs
## Job years created by scenario 2020-2099

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Estimated Cost</th>
<th>job years created</th>
</tr>
</thead>
<tbody>
<tr>
<td>No-build</td>
<td>$31,667,000,000</td>
<td>343,698</td>
</tr>
<tr>
<td>2</td>
<td>$34,694,000,000</td>
<td>376,552</td>
</tr>
<tr>
<td>3a</td>
<td>$53,807,000,000</td>
<td>583,995</td>
</tr>
<tr>
<td>3b</td>
<td>$54,216,000,000</td>
<td>588,434</td>
</tr>
<tr>
<td>4</td>
<td>$52,393,000,000</td>
<td>568,649</td>
</tr>
</tbody>
</table>
Cost estimates
## Construction Time Frames (2020 – 2044)

<table>
<thead>
<tr>
<th>Section</th>
<th>Mileage</th>
<th>Construction Cost</th>
<th>% of Length</th>
<th>% of Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MO 1 Kansas City Urbanized Area</td>
<td>21.5</td>
<td>$269.7</td>
<td>2.8%</td>
<td>2.7%</td>
</tr>
<tr>
<td>MO 2 Odessa to Boonville</td>
<td>64.8</td>
<td>$496.0</td>
<td>8.4%</td>
<td>4.9%</td>
</tr>
<tr>
<td>MO 3 Boonville to Rocheport</td>
<td>13.7</td>
<td>$198.5</td>
<td>1.8%</td>
<td>2.0%</td>
</tr>
<tr>
<td>MO 4 Columbia Area</td>
<td>18.1</td>
<td>$300.8</td>
<td>2.4%</td>
<td>3.0%</td>
</tr>
<tr>
<td>MO 5 Eastern Columbia to Kingdom City</td>
<td>14.3</td>
<td>$89.0</td>
<td>1.9%</td>
<td>0.9%</td>
</tr>
<tr>
<td>MO 6 Kingdom City to Route 19</td>
<td>27.0</td>
<td>$256.1</td>
<td>3.5%</td>
<td>2.5%</td>
</tr>
<tr>
<td>MO 7 Route 19 to Lake Saint Louis</td>
<td>39.0</td>
<td>$432.9</td>
<td>5.1%</td>
<td>4.3%</td>
</tr>
<tr>
<td>MO 8 St. Louis Urban Area</td>
<td>47.8</td>
<td>$1,402.0</td>
<td>6.2%</td>
<td>13.8%</td>
</tr>
<tr>
<td>IL-1 I-55 to Effingham (I-57 East)</td>
<td>84.0</td>
<td>$1,001.8</td>
<td>11.0%</td>
<td>9.9%</td>
</tr>
<tr>
<td>IL-2 Effingham (I-57 East) to IN State Line</td>
<td>48.5</td>
<td>$572.3</td>
<td>6.3%</td>
<td>5.6%</td>
</tr>
<tr>
<td>IN-1 Indiana State Line to Indianapolis</td>
<td>75.4</td>
<td>$915.3</td>
<td>9.8%</td>
<td>9.0%</td>
</tr>
<tr>
<td>IN-2 Indianapolis Urban Area</td>
<td>39.6</td>
<td>$763.7</td>
<td>5.2%</td>
<td>7.5%</td>
</tr>
<tr>
<td>IN-3 Indianapolis to Dayton</td>
<td>62.2</td>
<td>$744.9</td>
<td>8.1%</td>
<td>7.3%</td>
</tr>
<tr>
<td>OH-1 Dayton to Columbus</td>
<td>69.1</td>
<td>$864.0</td>
<td>9.0%</td>
<td>8.5%</td>
</tr>
<tr>
<td>OH-2 Columbus Urban Area</td>
<td>43.8</td>
<td>$776.8</td>
<td>5.7%</td>
<td>7.7%</td>
</tr>
<tr>
<td>OH-3 Columbus to Wheeling</td>
<td>98.5</td>
<td>$1,063.7</td>
<td>12.8%</td>
<td>10.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>767.4</strong></td>
<td><strong>$10,147.5</strong></td>
<td><strong>100%</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

- Section construction time frame assumed for cost estimation purposes only
Initial Cycle Cost, No Inflation (2020-2059)
Payee Cost Split, No Inflation (2020-2099)
State Cost Split, No Inflation (2020-2099)

- No-Build, Scenario #1: $12,762
- Build w/o DTLs, Scenario #2: $13,320
- Build w/ DTLs, Scenario #3a: $10,335
- Build w/ DTLs & HPVs, Build w/ DTLs, HPVs & Tech, Scenario #4: $8,428

Cost in Millions:
- MoDOT
- IDOT
- InDOT
- ODOT
Funding and Finance
Funding and Financing Options: Key Concepts

- Even if the project is not constructed Coalition states will need to spend
  - $32.2B over 75 years on maintenance and reconstruction of I-70
  - Current transportation funding programs will likely not be sufficient to meet this and other transportation needs
Funding and Financing Options: Key Concepts

- State and local motor fuel tax revenues generated $5.1B for the Coalition states in 2008

- For illustrative purposes:
  - Annual revenues would need to increase by 10%, with the increase dedicated to the project, over a 25-year period to cover costs that are not supported by tolls or an equivalent user fee
  - Without tolls or an equivalent user fee, this increase would need to be 72%
  - If the project is not constructed, this increase would need to be 42% to maintain the existing I-70 corridor
Funding and Financing Options: Key Concepts

- SAFTEA-LU programs provided $8.5B Annually to Coalition states

- For illustrative purposes:
  - 6% of cumulative annual receipts would need to be dedicated to the project over a 25-year period to cover costs that are not supported by tolls or equivalent user fee
  - Without tolls or an equivalent user fee, this percentage increases to 43%
  - If the project is not constructed, 25% of cumulative annual receipts would need to be dedicated to the I-70 corridor over a 25-year period for maintenance and rehabilitation
PPP Financing Capacity Analysis

- Assumptions
  - Public-Private Partnership (PPP) agreement
    - Design / build / finance / operate / maintain
    - Single project operated by a single concessionaire
  - Toll all vehicles in all lanes
  - 75-year term
  - Construction in 5 consecutive phases over first 25 years.
  - Initial construction begins in 2020, with first phase open in 2025
  - States will continue to maintain roadway segments until construction begins on each segment.
Financing Capacity Analysis

- Total public investment required is $7.5B
  - $5.5B for PPP
  - $2.0B to maintain existing segments after 2020 until construction begins on each segment
Financing Capacity Analysis

- Tolls support 86% of total project costs
Cost to maintain vs build (2020-2099)

- Cost to continue as is = $35 billion
- Cost for DTLs = $53 billion

- Difference is about $18 billion over 79 years
- If concessionaire - - - - 73% of $53 Billion covered
- States share = $7.5 Billion over 75 years
Funding and Financing Options:

- Good candidate for Transportation Infrastructure Finance and Innovation Act (TIFIA) funding
  - Funding for TIFIA is uncertain in the near-term
  - Program is over subscribed
  - Program’s limited capacity is exacerbated by the overall limited availability of federal funds

- Good candidate for Private Activity Bonds (PABs) under a PPP
  - Lower cost of capital encourages private investment
  - PPP would require enabling legislation and multi-state agreements
Funding and Financing Options:

- Project will require leveraging traditional transportation funds with other revenue sources
- Coalition states will need to work together in exploring available funding sources
- Tolling or an equivalent user fee can provide a significant source of funding
### Legislative authority

<table>
<thead>
<tr>
<th>State</th>
<th>Tolling: Legislative approval required</th>
<th>P3</th>
<th>Bonding: Legislative approval required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missouri</td>
<td>Yes</td>
<td>Legislative approval required</td>
<td>Yes</td>
</tr>
<tr>
<td>Illinois</td>
<td>Yes</td>
<td>Legislative approval required</td>
<td>Yes</td>
</tr>
<tr>
<td>Indiana</td>
<td>Yes</td>
<td>Governor may enact</td>
<td>Yes</td>
</tr>
<tr>
<td>Ohio</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
<td>ODOT has authority</td>
<td>Yes</td>
</tr>
</tbody>
</table>

<sup>1</sup> ODOT Direct may apply tolls to new lanes
How do the scenarios compare
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Congestion</th>
<th>Safety</th>
<th>Jobs created</th>
<th>Cost to build</th>
<th>Carbon footprint</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>- -</td>
<td>- -</td>
<td>- -</td>
<td>+ +</td>
<td>- -</td>
</tr>
<tr>
<td>No-build</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>- -</td>
<td>-</td>
<td>+</td>
<td>- -</td>
</tr>
<tr>
<td>3 a</td>
<td></td>
<td>+</td>
<td>+</td>
<td>- -</td>
<td>-</td>
</tr>
<tr>
<td>3 b</td>
<td>+</td>
<td>+ +</td>
<td>+ +</td>
<td>- -</td>
<td>+</td>
</tr>
<tr>
<td>4</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

**Most favorable**

++  +

**Least favorable**

-  -
### Scenarios Evaluated in Phase 2

<table>
<thead>
<tr>
<th>Scenario</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Concept</strong></td>
<td>No-&lt;sup&gt;a&lt;/sup&gt;</td>
<td>Build&lt;sup&gt;b&lt;/sup&gt;</td>
<td>Build Four DTL’s</td>
<td>Build DTL’s (4 lanes rural, 2 lanes urban)</td>
</tr>
<tr>
<td>Add capacity to general purpose lanes</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural Sections</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of DTL Lanes in each direction</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Truck interchanges (grade separated/slip ramps)</td>
<td></td>
<td></td>
<td>24</td>
<td>24</td>
</tr>
<tr>
<td>Physically separate the lanes with barriers and medians</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Urban Sections</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of DTL Lanes in each direction</td>
<td></td>
<td></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Number of separated truck interchanges</td>
<td></td>
<td></td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Physically separate the lanes with concrete barriers and shoulders</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>HPV Staging Area</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

#### Lane Miles of I-70 Improvements

- Scenario 1: 38 lane miles
- Scenario 2: 122 lane miles
- Scenario 3A: 3,106 lane miles
- Scenario 3B: 3,106 lane miles
- Scenario 4: 2,969 lane miles
Public stakeholders
Public Stakeholder Concerns:

- Safety
  - Access for first responders
  - Interactions between trucks and other traffic at interchanges
- Access
- Funding
- Impacts
- Other Modes
Motor Carrier Perspectives

ATRI – Focus groups and interviews with motor carriers
Discussion of Key Topics

- Safety Improvements
  - Separation Decreases Risk Exposure
    - Elimination of Car/Truck Interactions
  - HPVs Reduce Total Truck Traffic

- Trucks and/or HPVs Should Not be Regulated into Specific Lanes (e.g. Left Lane Restrictions)
Discussion of Key Topics

Strong Support for HPVs

- Documented Benefits
  - Decreased Fuel Consumption
    - Improved Air Quality
  - Decrease in Congestion
  - Anecdotal Safety Benefits

- Interest in Performance-Based Configurations
  - Triple 28s
  - Turnpike/Rocky Mountain Doubles
  - 6-axle Tractor Semi-Trailer

- Interested in an HPV Test Program on I-70
Discussion of Key Topics

Final Message…

- National Network is Critical to Connectivity & ROIs
  - Justification of Fleet Equipment Investments
  - Dynamic Manufacturing/Distribution
  - I-70 is a Good Test Bed/First Leg
    - Manufacturing
    - Linkages to West Coast HPV Scenarios

- DTL Access Points Critical to Trucking/National Network
Motor carriers’ preferences if tolled……

1. All vehicles pay
2. Electronic – no need to stop
3. Trucks be permitted in all lanes / DTLs voluntary
4. All tolls go back into roadway – not used for other facilities or purposes
5. Tolls end when facility is paid-off
### Shipper, Receiver and 3PL Feedback

(31 respondents – both phases)

<table>
<thead>
<tr>
<th>Fortune 1000 Revenue Ranking</th>
<th>Respondents</th>
<th>Percentage of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 100</td>
<td>6</td>
<td>19.3%</td>
</tr>
<tr>
<td>101 to 300</td>
<td>4</td>
<td>12.9%</td>
</tr>
<tr>
<td>301 to 600</td>
<td>5</td>
<td>16.1%</td>
</tr>
<tr>
<td>Not Fortune 1000 rated</td>
<td>16</td>
<td>51.7%</td>
</tr>
</tbody>
</table>
## Shippers Perceived Value of DTLs

<table>
<thead>
<tr>
<th>VALUE</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>74.2%</td>
</tr>
<tr>
<td>Safety</td>
<td>74.2%</td>
</tr>
<tr>
<td>Reduced Cost</td>
<td>61.3%</td>
</tr>
<tr>
<td>Service</td>
<td>54.8%</td>
</tr>
<tr>
<td>Intermodal</td>
<td>9.7%</td>
</tr>
<tr>
<td>Driver Interest</td>
<td>6.5%</td>
</tr>
</tbody>
</table>
Affirmed - Must Have(s)

- Cost savings if there is a charge for use
  - Increased payload (HPV - weight)
  - Combination trailers (HPV - size)
  - Improved truckload asset utilizations (turns/day-week) with or without HPV

- Reasonable travel distance to and from Corridor
  HPV – weight and or combination trailers intact

Note: Recommend ocean and domestic containers move in tandem to and from Intermodal yards
Shipper focus Group
Who’s potentially willing to pay?

Corridor shippers/receivers *Using HPVs* (size and weight opportunities (commodity indifferent))

- Finished goods (FG) shipments across corridor or to consignees proximate to the corridor
- Intra company FG moves between plants/DC
- Raw materials into corridor plants
- Movements (domestic/imports/exports to/from intermodal yards)
- Repetitive movement opportunities requiring consistent transit times (Short to mid-distance)

Note: Demonstrable ROI study needed before commitment
Shipper focus Group
Potentially who won’t pay

- Those that cannot create productivity with size, weight, turns & JIT.
- OD pairs originating and terminating away from corridor and do not have interest or HPV capable carrier base.
- Can’t find carriers willing to provide HPV equipment
- Owner-Operators that do not have HPVs.
- Private/Dedicated fleets unwilling to train drivers or sufficient ROI to convert fleet.
- Potential HPV shippers/receivers too far away from assembly points to create needed productivity.
Show Stoppers/Limiters

**Stoppers**
- Congress approves HPVs on all interstates.
- Rates are prohibitively high
- HPVs significantly less than defined

**Limiters**
- Limited Access/Egress
- Limited HPV travel distance beyond corridor
Risks
Risks

- Organization
- Policy
- Funding
- Construction
- Operations
- Maintenance
- Standardization
Next Steps
Keys to the success of the next steps:

- Keep the I-70 Coalition together
- Keep critical stakeholders engaged
- Strengthen relationships with motor carriers, shippers and receivers
- Create a sustainable revenue stream
Actions – level 1- short term

- Reaffirm commitment
  - Position paper/presentation for CEO’s
  - FHWA to host webinar with CEOs
- Maintain Coalition
  - Peer exchange / other coalitions
- Identify and develop Coalition projects
  - Uniformity (SPR 2 ?)
    - Regulations, enforcement, ITS Coordination, Incident management, Green initiatives
  - Potential pilot projects w/ motor carriers – HPVs
Stakeholder outreach next steps:

- Outreach to MPOs and DOTs
- Online meeting for public stakeholders
- Online survey related to the online meeting
Opportunities for Coalition to work together on projects other than DTLs

- ITS Technology
- Green Corridor
ITS Summary

- Already exists along the corridor
- Technology continues to evolve and will play a role in corridor operations regardless of TOL
- ITS is a relatively fast and inexpensive way to move the corridor forward
- But, ITS requires higher annual operational costs to avoid obsolescence
Green Highway

- Short-Term Steps
  - LED lighting, sign reflectivity
  - Ice/snow pre-treat, living snow fences
  - Pavement recycling, use of recycled materials
  - Culvert retrofits
  - Truck stop electrification
  - Solar energy
  - LCV/HPV allowances
Green Highway

- Long-Term/Construction Steps
  - Roadway alignment – vertical curves
  - Roadway materials, recycled materials
  - Wetland and habitat restoration above minimum
  - Bio-swales, terraces
  - Alternative fuels trucks/corridor – LNG on I-5
  - Rest areas/truck breakdown areas
Conclusion: Unique Opportunity

The I-70 corridor states, acting in concert, have a unique opportunity to:

- Create a highly efficient and effective ‘logistical artery’ for current and prospective businesses

- Achieve higher levels of safety and efficiency for everyone.
Consultant Team – Phase 2
www.i70dtl.org