I-40/I-81 Study Update
Nashville

April 3, 2008
Agenda

• I-40/I-81 – Tennessee’s Major Artery
• Study Overview
• Process for Evaluating Potential Solutions
• Preliminary Study Results
• Remaining Steps
Study Corridor

- Bristol to Memphis, 550 Miles
- Includes 9 of State’s 12 RPOs
- Crosses 8 of State’s 11 MPOs/TPOs
Corridor Importance

• A Corridor in the Strategic Investment Plan
• 55% of State’s population live along the corridor (28 counties)
• Truck volumes along corridor are estimated to double by 2030; trucks carry 74% of freight in State
• Rail freight volumes projected to increase over 50% by 2030
Corridor Importance

- Major commuting route in urban areas
- Serves as a jurisdiction’s “Main Street” and provides local access if parallel roads are congested or don’t exist
- Demand along corridor is very different from original system function of facilitating interstate travel
Study Purpose

• Identify & address I-40/I-81 deficiencies
• Identify low-cost operational improvements along corridor
• Consider effectiveness of truck/rail diversion
• Consider multi-modal solutions
Identify, Evaluate & Prioritize Solutions That Address:

- Congestion & capacity
- Operations & maintenance
- Safety & security
- Freight movement & diversion
- Economic access
- Commuter patterns
- Inter-modal facilities (freight and/or passenger)
Study Outcomes

- Projects & strategies for consideration by TDOT, MPOs/TPOs & RPOs
- Short, mid & long-range solutions and cost estimates
Previous Nashville Public Meeting

• Held on September 4, 2007
• Provided background on I-40/I-81 study
• Asked if there were deficiencies in the corridor beyond what we had identified
• Requested input into range of potential solutions to be considered
Other Regional Stakeholder Meetings

- Memphis  March 31
- Jackson   April 1
- Knoxville April 7
- Tri-Cities April 8
- Cookeville April 10
Initial Screening Process

• Five “packages” of multimodal solutions for corridor analysis for 2030
  – Existing + Committed Improvements
  – Roadway Capacity
  – Corridor Capacity
  – Operational Solutions
  – Rail-Focused Solutions

• Developed performance measures from statewide and urban area models

• Off-model analysis for selected measures
Purpose of Evaluation Process

• Identify solutions/projects with highest benefit/cost (B/C) ratios, recognizing that this measure represents only one factor in project assessment

• Identify solutions/projects that will provide benefits in short- and mid-term periods
Evaluation Process

• B/C ratios estimated for projects from those “packages” found to be significant
• Benefits for each project *monetized* to allow consistent measurement across evaluation criteria
• Roadway cost estimates consistent with TDOT methodology
• Projects evaluated for multiple planning horizons
• Benefits estimated *only* for I-40 & I-81
Evaluation Components

- Auto hours of recurrent delay
- Truck hours of recurrent delay
- Auto hours of non-recurrent (incident) delay
- Truck hours of non-recurrent (incident) delay
- Number of accidents
- Number of fatalities
Identified I-40 Widening Projects

- Widen to 6 Lanes between Exit 226 (Mt. Juliet Rd) and Exit 235 (SR-840)
  - 2030 B/C ratio of 3.2 for widening 8-mile segment at an estimated total cost of $54 million
  - Modeling analysis shows need for these improvements by 2011
Six-Lane Widening
Between Exit 226 and Exit 235

Needed by 2011
$54 M
(2008 Dollars)
I-40 Corridor Capacity
Projects

• Completion of remaining segments of SR-840
  – 2030 B/C ratio of 5.7 for completing this roadway at estimated cost of $248.8 million
  – Provides alternative route for I-40 through traffic and motorists going to I-65 South and I-24 South
SR-840 Corridor Capacity Project

$248.8 M (2008 Dollars)
Truck/Rail Diversion

- Truck trips are divertible to rail if
  - Trip distances are long (greater than 500 – 750 miles)
  - Commodities can be handled easily by rail
    - Bulk goods
    - Non-perishable goods
    - Goods easily packaged and shipped using intermodal containers
  - Rail network matches desired trip origin and destination
I-40/I-81 Rail Improvement Alternatives

Trans-TN
B/C = 0.1

Crescent Corridor
B/C = 5.0
Trans-Tennessee Rail Corridor

- Re-development of rail connection between Crossville and Cookeville
- Provides rail connection across state
- Direct rail service between Nashville and Knoxville
- Estimated cost of improvements is $1.2 billion
Crescent Corridor

- NS estimates over 1 million divertible truckloads along the Crescent Corridor
- Plans forecast 28 new trains per day
- NS seeking public-private partnerships to improve the rail network at an estimated cost of $2 billion
- Corridor investments will begin this year with roll-out of improved services in 2009
- Entire network to be complete by 2013
Cooperation with Virginia

• Regular meetings on rail corridor planning between DOT officials from both states
• Cambridge Systematics also is assisting Virginia in analyzing benefits of truck-rail diversion
• Virginia shared results of I-81 truck origin-destination surveys with TDOT to assist in calibration of truck-rail diversion model
I-40 Rail-Focused Improvements

- Norfolk Southern Crescent Corridor
  - 2030 B/C ratio of 5.0 warranting further analysis of planned improvements in and out of the state

- Trans-Tennessee Rail Corridor
  - 2030 B/C ratio of 0.1, but includes benefits for I-40/I-81 Corridor & economic benefits identified in *An Evaluation of Tennessee Rail Plan’s Treatment of a Trans-Tennessee Rail Routing only*
I-40/I-81 Operational Solutions

• High occupancy vehicle (HOV) or high occupancy toll (HOT) lane expansion or conversion

• Intelligent Transportation System (ITS) improvements

• Interchange, rest area & weigh station ramp improvements

• Truck climbing lanes
I-40/I-81 Operational Solutions

- Improve ramp from I-40 east to I-440 south ($2.8M)
- Convert HOV to HOT Lanes, east of Nashville
- Extend ITS (HELP, camera, DMS) west of Nashville to SR-46 (Exit 172)
- Extend ITS (HELP, camera, DMS) east of Nashville from SR-255 to SR-940
I-40 HOT Lanes in Nashville

• Low volume of HOVs in 2005 with high number of violators

• HOT lanes would permit single-occupant vehicles to pay to use lane and reduce violators

• Would require change in state law to allow pricing on existing interstates

• Could provide dedicated funding for enforcement, but would not likely generate significant revenue
I-15, Salt Lake

I-394, Minneapolis

10 ft Shoulder

HOT Lane

12 ft HOT Lane

4 ft Buffer

12 ft General Purpose Lanes

10 ft Shoulder

I-40 / I-81 CORRIDOR FEASIBILITY STUDY
10 ft Shoulder

Express Toll Lanes

Barrier or Buffer

12 ft General Purpose Lanes

10 ft Shoulder

MANAGED EXPRESS / TRUCK TOLL Lanes
I-40 HOT Lanes in Nashville

- Mid-term potential for HOT lanes in median west of I-440
- Long-term potential for limited lane extensions & queue bypass treatments to improve access from HOT lanes to downtown
- Supplement with active traffic management
  - Dynamic merge control, speed controls, truck restrictions, etc.
ITS Expansion along I-40

- Extend ITS west to SR-46 (Exit 172) & east between Donelson Pike and SR-840 (Exit 235)
- Equipment cost of $4.3 million with annual operating/maintenance cost of $445,000
- System includes:
  - Surveillance cameras
  - Speed detection at ½ mile intervals
  - Dynamic message signs
  - HELP service vehicles
  - 511 and Web traveler information
  - Real time weather sensors
I-40/I-440 Interchange Improvement

- Extend I-40 eastbound deceleration lane
- Lengthen ramp from I-40 eastbound to I-440
- Estimated cost of $2.8 million
- Suggested during stakeholder interviews
Interchange Improvement at I-40/I-440
Truck Climbing Lane
Dickson County

- Based on AASHTO standards for vehicular traffic, truck traffic & percent grade
- About 1.33 miles long, in eastbound direction
- Estimated cost of $23 million (2008 Dollars)
- Maximum grade of 3.8%
Truck Climbing Lanes
Cheatham County

- **Westbound Lane**
  - about 1.28 miles long
  - Estimated cost of $21 million (2008 Dollars)
  - Maximum grade of 4%

- **Westbound Lane**
  - about half-mile long
  - Estimated cost of $16 million (2008 Dollars)
  - Maximum grade of 5.3%
Truck Climbing Lane
Smith County

- About half-mile long, in eastbound direction
- At western boundary of Smith County
- Estimated cost of $12 million (2008 Dollars)
- Maximum grade of 5.4%
Project Programming

- Near-term, medium-term and long-term projects with highest B/C ratios identified for each region
- Projects divided into constructible segments
- Segments are programmed based on timing of impacts and availability of funds
## Remaining Steps

| Late April | Review public comments with TDOT |
| May        | Present draft corridor program to Commissioner |
|            | Complete corridor program & Final Report |
For more information on the study, contact:

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