



# **Update on Opportunities for Truck to Rail Diversion in Virginia's I-81 Corridor**

**Presented to the Commonwealth Transportation Board**

September 17, 2008

**Alan Meyers  
Cambridge Systematics, Inc.**

# About this Report

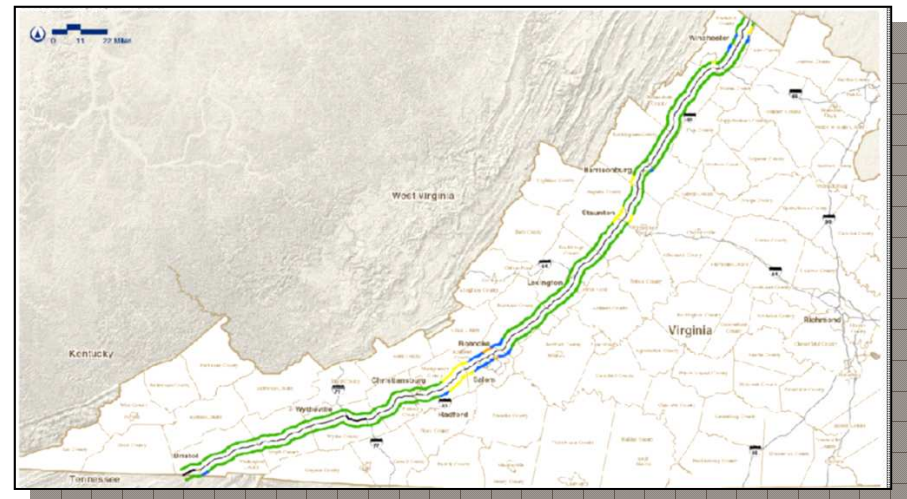
- **Primary objectives**
  - Comply with the requirements of Virginia’s 2007 Appropriations Act, Item 442, which calls for “development of a feasibility plan to define the conditions that would be necessary to divert the maximum amount feasible of the long-haul, through-truck freight traffic to intermodal rail in the Interstate Route 81 Corridor.”
  - Address issues raised in CTB Resolution of Oct. 11, 2006 and Virginia Acts of Assembly Chapter 934 (H 1581)
- **Process**
  - Led by Commonwealth’s Multimodal Office and Department of Rail and Public Transit, in cooperation with: Secretary of Transportation’s Office; Norfolk Southern; Cambridge Systematics; Woodside Consulting; HLB Economics
  - NS provided operations modeling, market estimates, improvement plans
  - Commonwealth provided independent analysis and validation of NS inputs
- **Organization**
  - Vehicle Activity on I-81
  - “Baseline” Intermodal Rail Traffic Paralleling I-81
  - Maximum Feasible Diversion of I-81 Trucks to Rail
  - The NS Crescent Corridor Proposal
  - Cost and Benefit
  - Preliminary Findings

# Vehicle Activity on I-81

## Key attributes of I-81

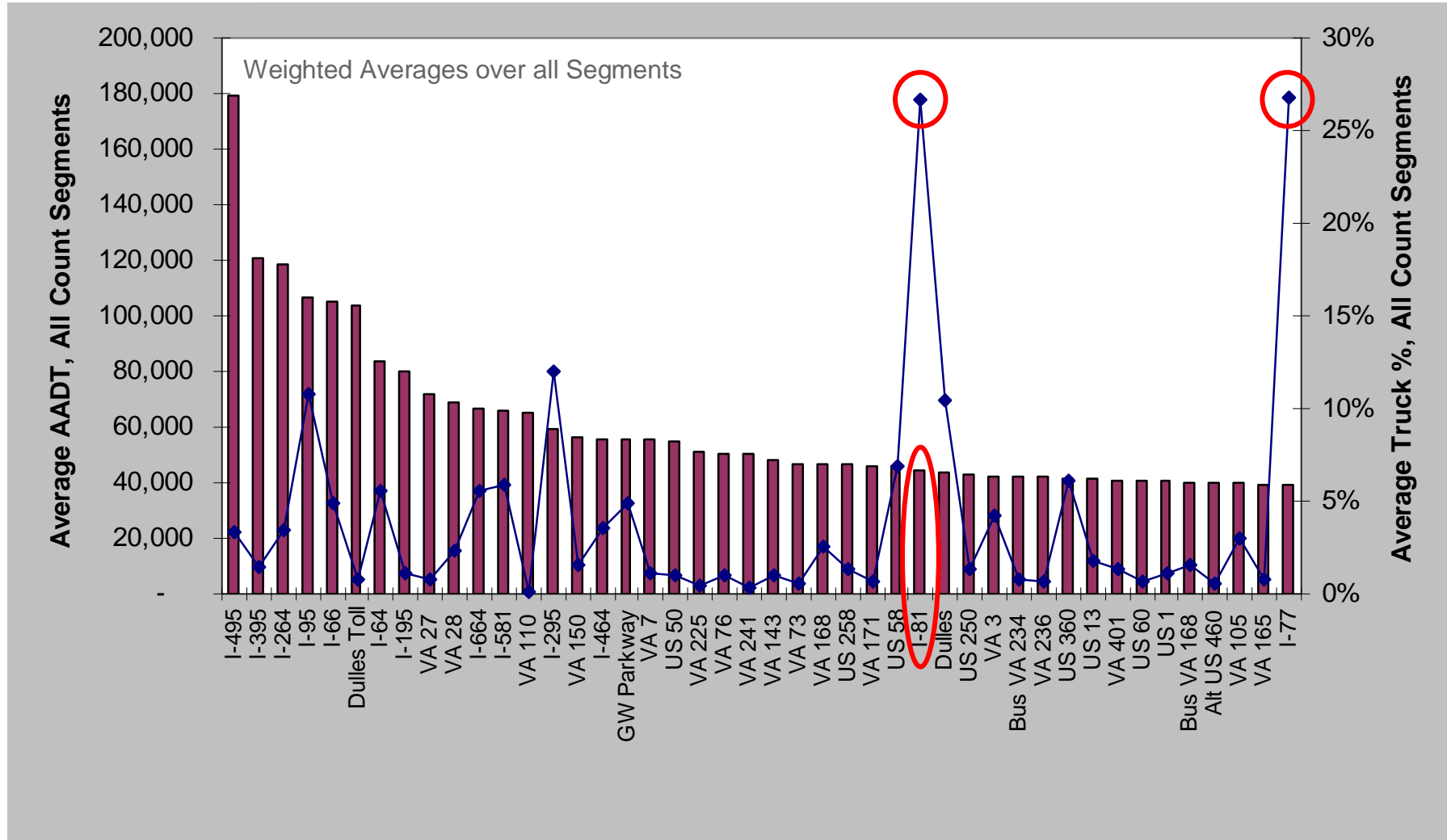


- **Extent**
  - 855 miles through six states, 325 miles in Virginia
  - Local and regional connector; national and international trade corridor
- **Current performance in Virginia**
  - 7% of I-81 mileage is below LOS standards in the peak period
  - Two-thirds of mileage, exits have geometric deficiencies
  - Ten locations with slow travel speeds



## Vehicle Activity on I-81

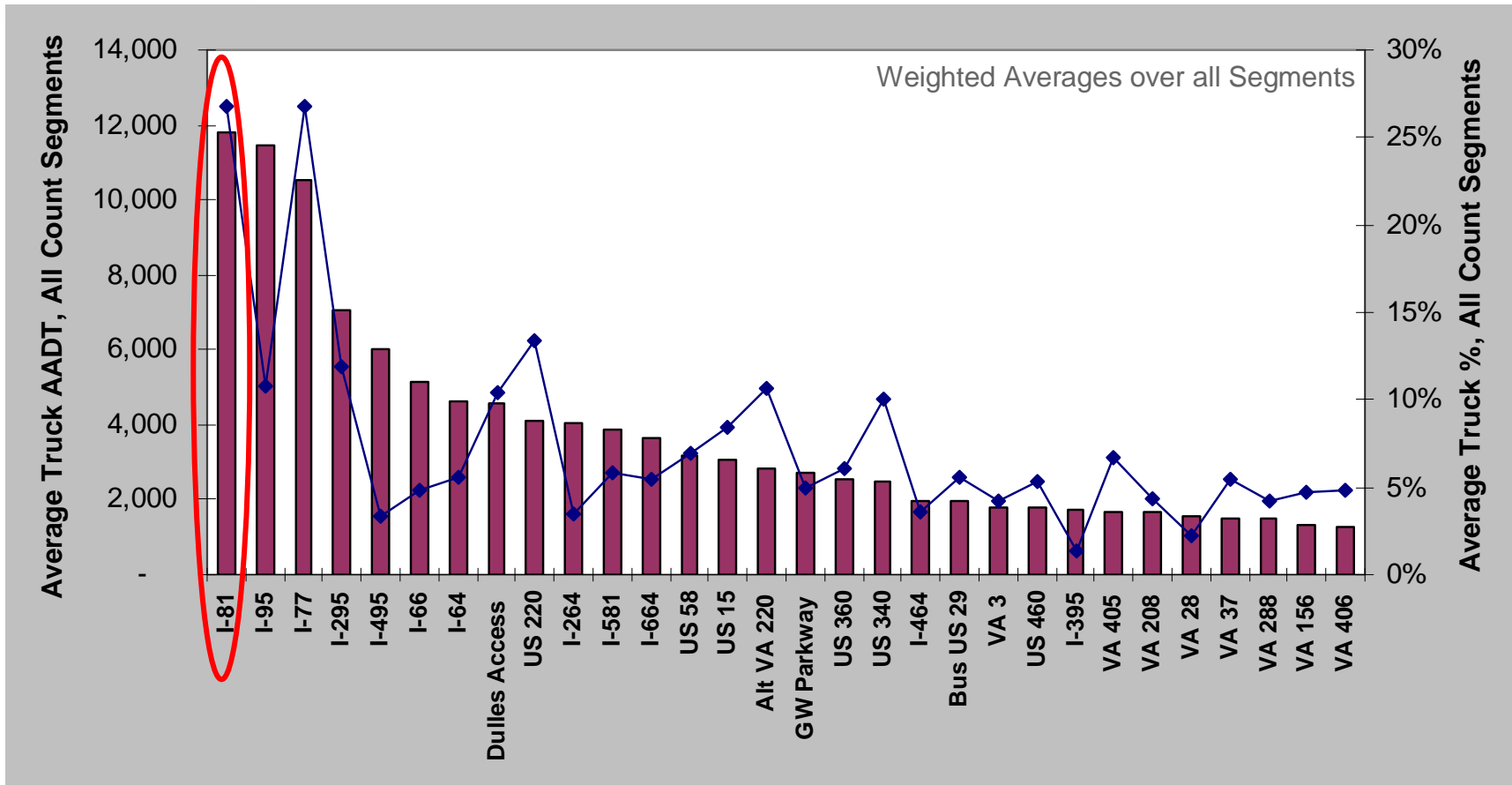
*Compared to other routes, lower for total traffic (44,185/day, 16.1 mil/yr) but highest for truck percent (27%)*



Source: VDOT Traffic Counts (2005)

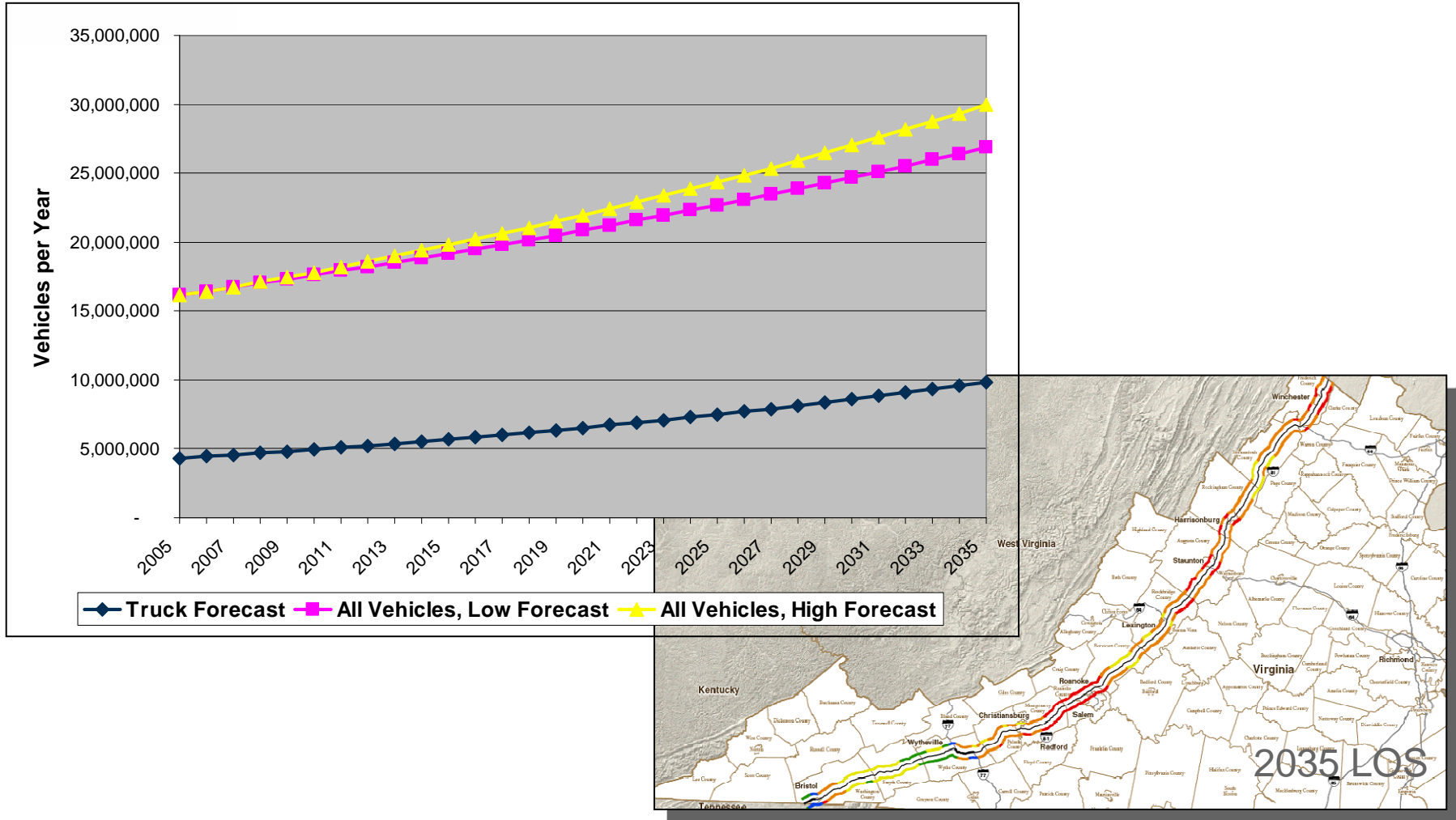
# Vehicle Activity on I-81

*Compared to other routes, highest for truck volumes*



# Vehicle Activity on I-81

**AADT growth at 1.7 to 2.1%; truck growth at 2.8%; declining peak period performance through 2035**



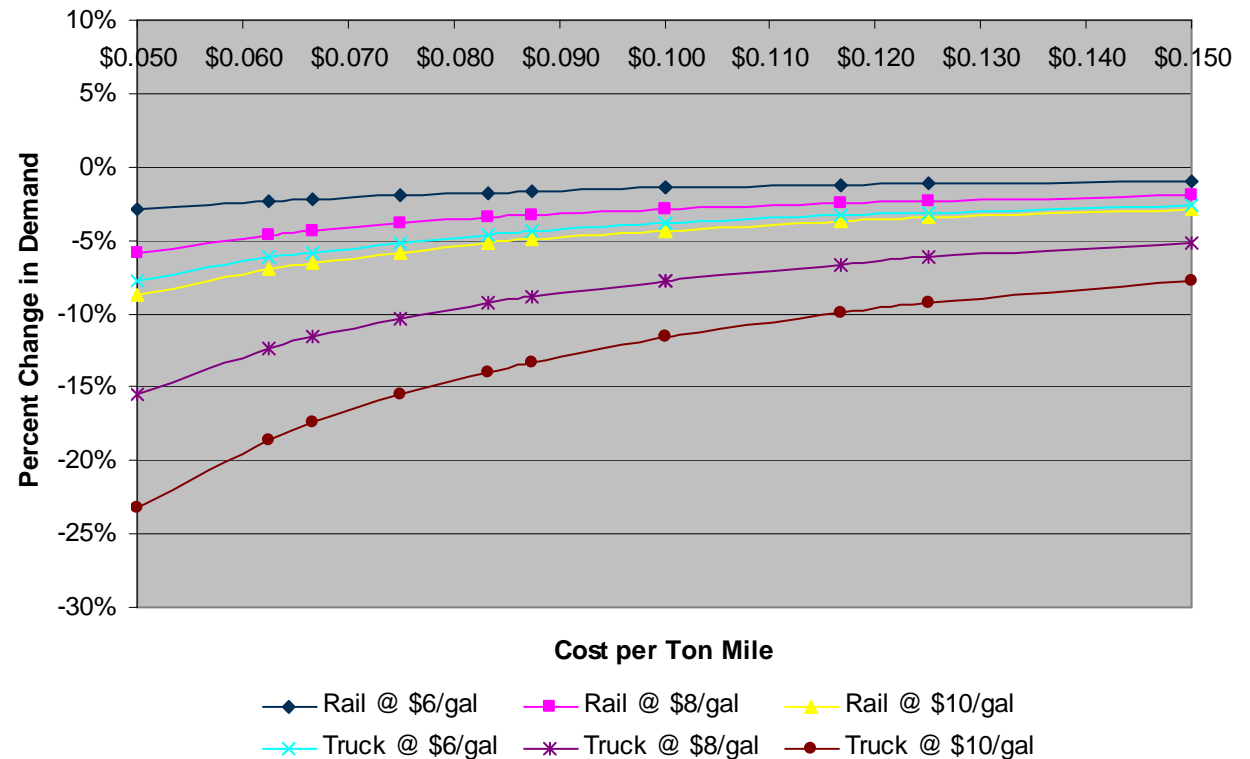
Sources: Virginia Statewide Multimodal Freight Plan and I-81 Corridor Improvement Study Tier I EIS

# Vehicle Activity on I-81

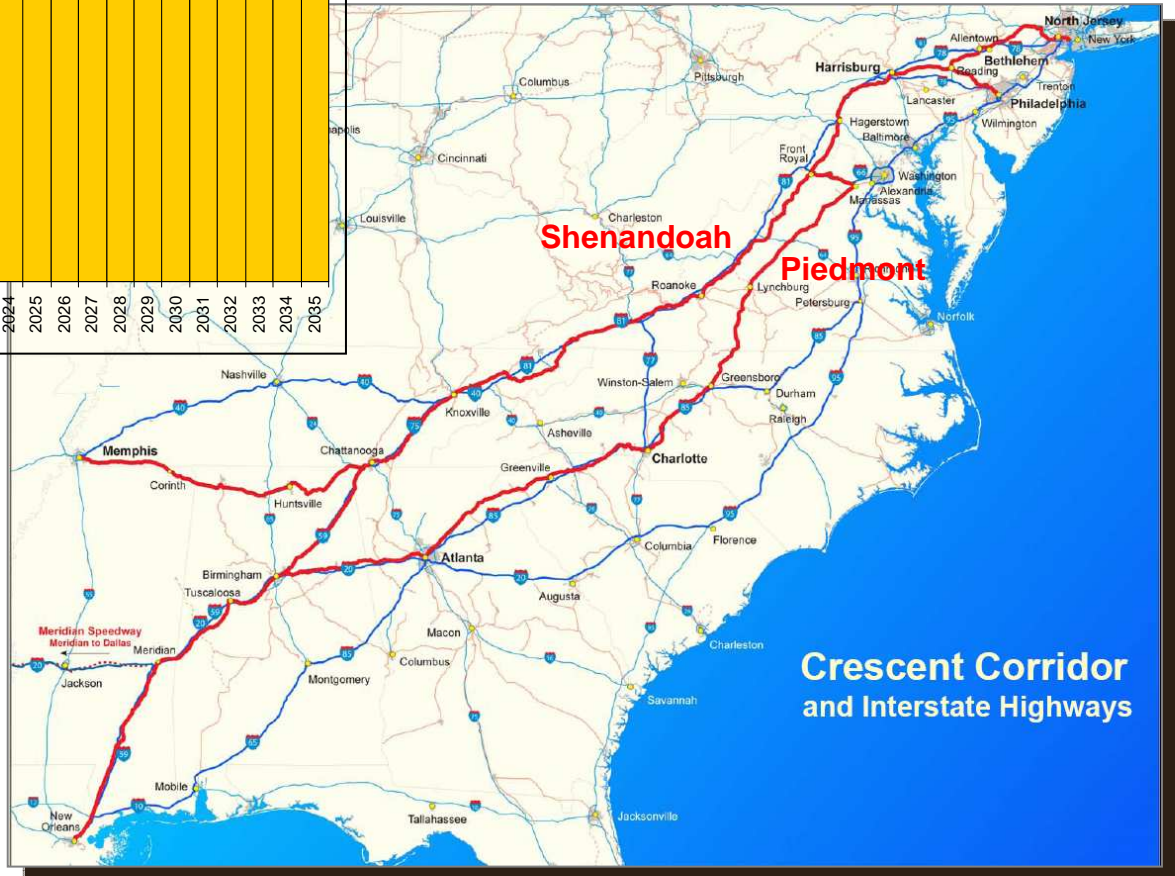
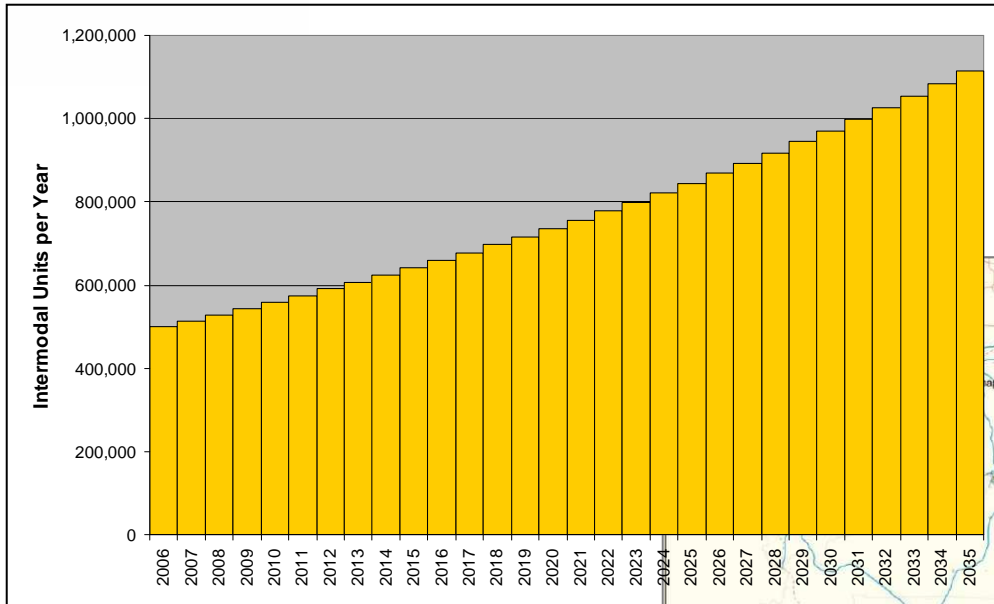
## *Rising fuel prices could mean lower truck growth*

- Should have good data in a few more months; for now, we expect:
  - Fuel price increases should suppress freight ton-mileage; effect should be biggest for trucking (which is less fuel efficient) and for low-cost hauls
  - Trucks will increase load factors and shift to intermodal rail
  - Rail may lose some existing business, but should make it up from new intermodal
  - Consistent with anecdotal information

	Fuel Efficiency (Ton-Miles/Gallon) (Source = Texas Transportation Institute)
Inland Barge	576
Freight Rail	413
Truck	155



**“Baseline” Intermodal Rail Traffic Paralleling I-81**  
*500,000 intermodal units per year, growing at 2.8% year with normal railroad investment – these are “avoided” trucks*



Source: Norfolk Southern (2006 data)



# Maximum Feasible Diversion of I-81 Trucks to Rail

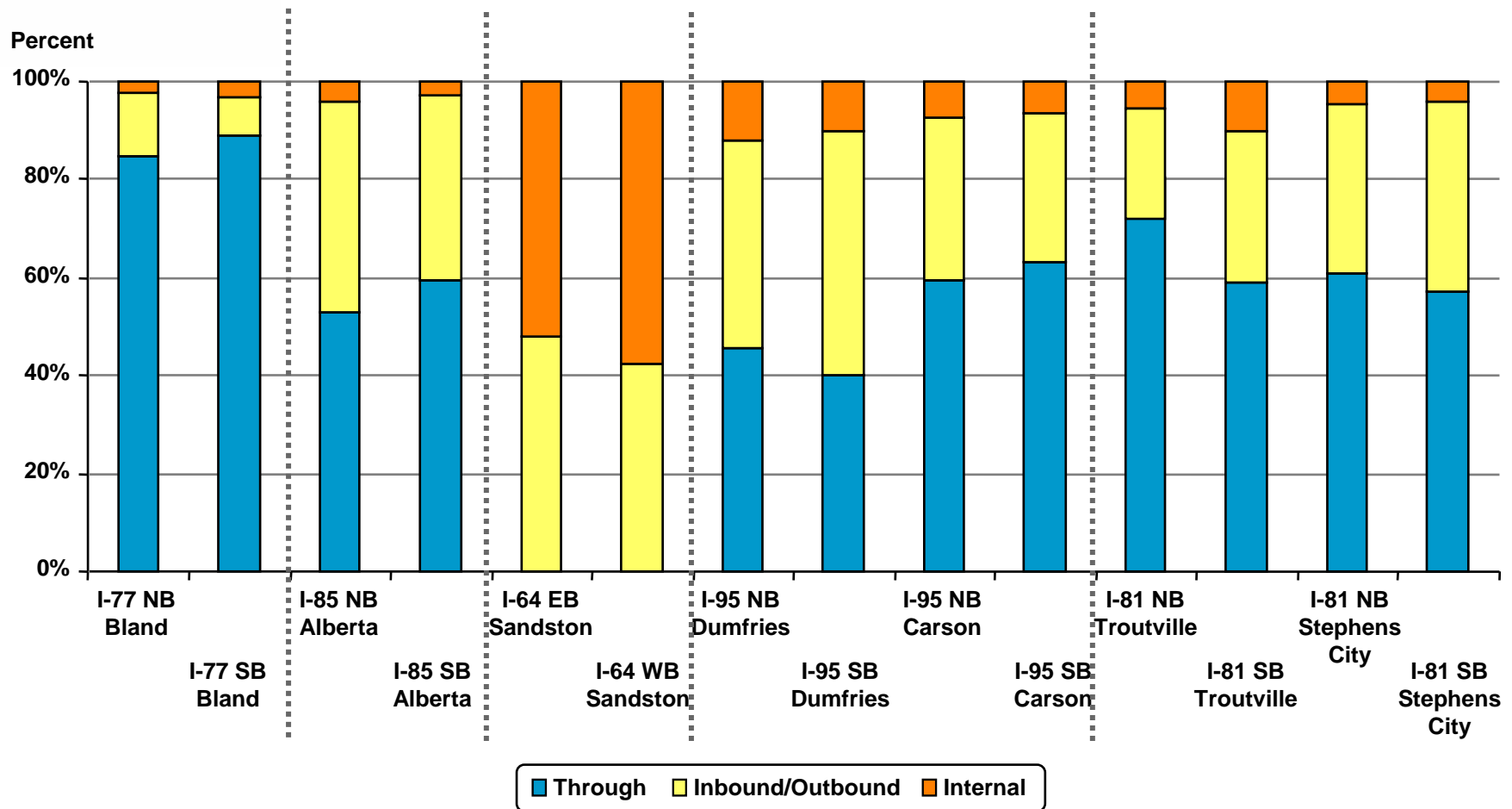
## *Understanding how trucks use I-81*

- **24-hour truck survey, June 19-20, 2007**
  - Two weigh stations on VA I-81
  - Trucks pulled out of scale lanes, asked short set of questions (origin, destination, load status, routes of entry and exit, commodity)
  - Surveyor recorded additional information (truck class, type, hazmat, pre-pass)
- **Results**
  - Roughly 10% of counted trucks were surveyed – very few refusals, the limiting factor was parking and traffic flow
  - Good quality information for origin-destination states, the most critical data



	Troutville NB	Stephens City NB	Troutville SB	Stephens City SB
Total Trucks Counted at Nearest Count Stations	7,779	8,667	6,970	7,960
Through % (starting <u>and</u> ending outside of VA, using I-81 alone or in combination with I-77 and other routes)	70.3%	60.7%	59.1%	57.5%
Inbound/Outbound % (moving into VA from another state, or moving out of VA to another state)	24.8%	34.6%	30.9%	38.2%
Internal % (moving between two points in VA)	4.9%	4.7%	10.0%	4.3%

# Maximum Feasible Diversion of I-81 Trucks to Rail Through percentages on I-81 versus other routes

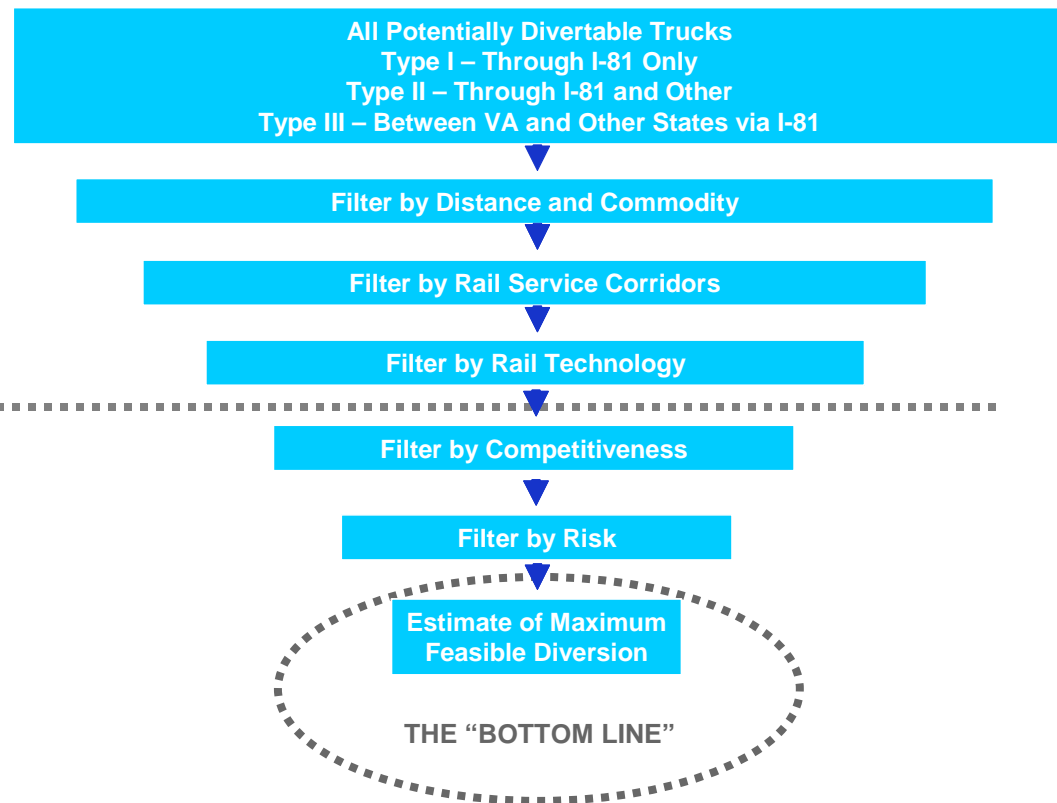


# Maximum Feasible Diversion of I-81 Trucks to Rail

## *Key definitions and the stepwise estimation process*

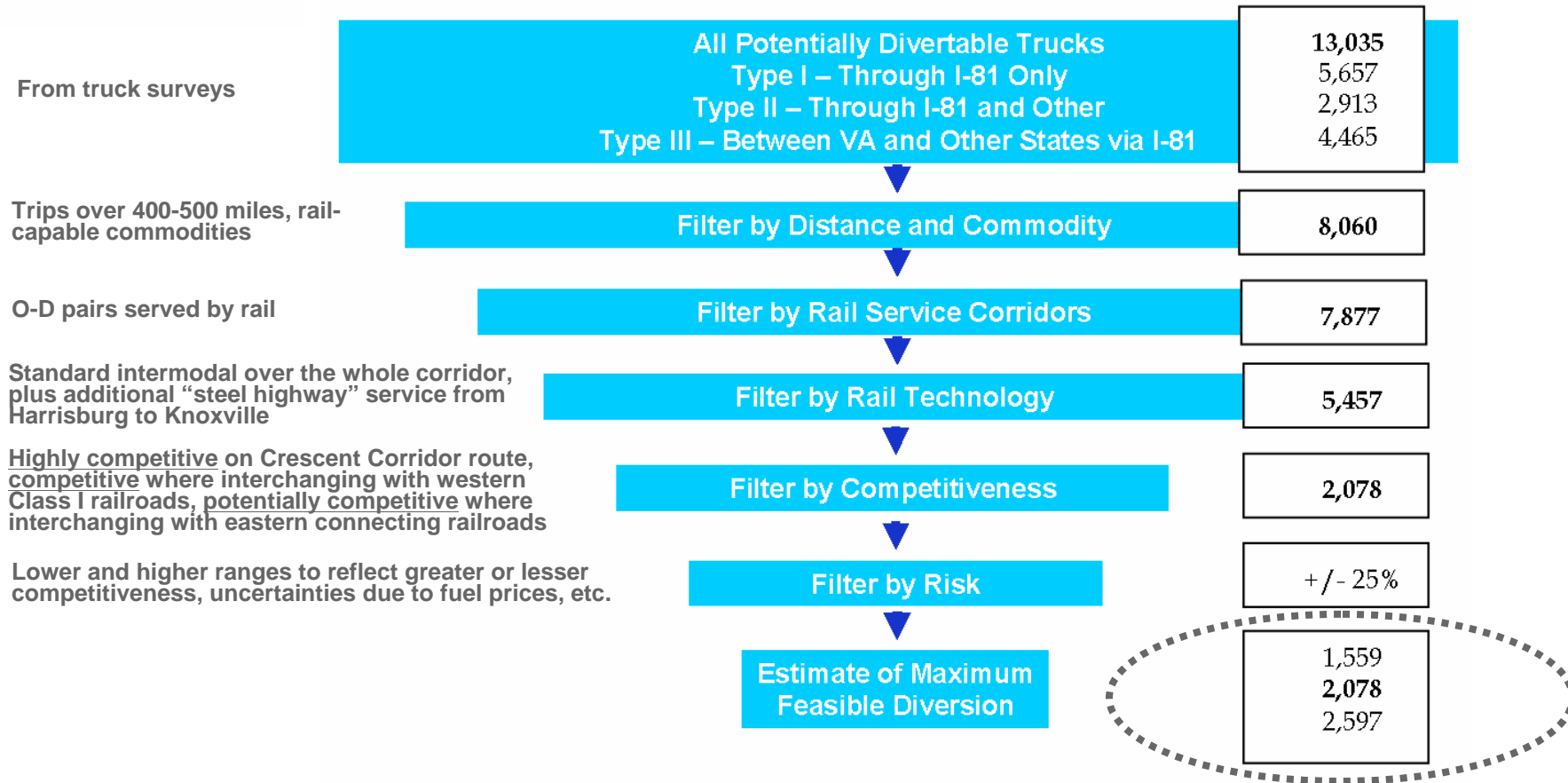
**Potentially Divertible Trucks:** trucks using I-81 that are making moves that could potentially be served by rail, using standard technology over the Crescent Corridor, and also introducing “steel highway” service in the Harrisburg to Knoxville corridor, in a “perfect world” – independent of capacity, service, and competition

**Maximum Feasible Diversion:** the share of potentially divertible trucks that it is feasible to divert under “real world” conditions, reflecting the type of rail service, its competitiveness and attractiveness versus trucking, and risk and uncertainty



# Maximum Feasible Diversion of I-81 Trucks to Rail Results

Average trucks per day  
at count stations, both  
directions, 2007



# Maximum Feasible Diversion of I-81 Trucks to Rail

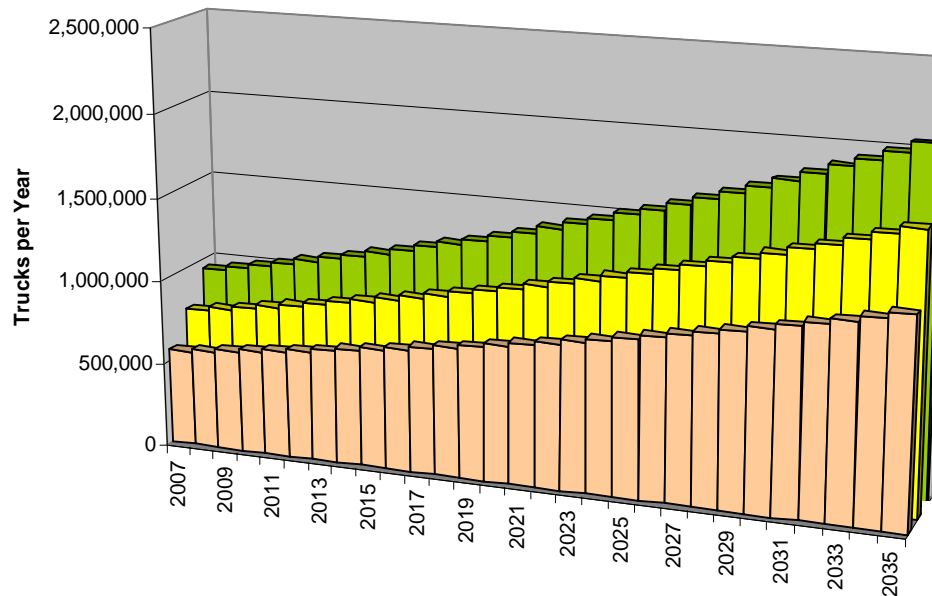
*Trucks diverted per year through 2035 – assuming adequate rail capacity is made available*

## 2007 Diversion

**High = 2,597/day;  
947,990/year**

**Base = 2,078/day;  
758,392/year**

**Low = 1,559/day;  
568,794/year**



## 2035 Diversion

**High =  
2,054,049/year**

**Base =  
1,643,239/year**

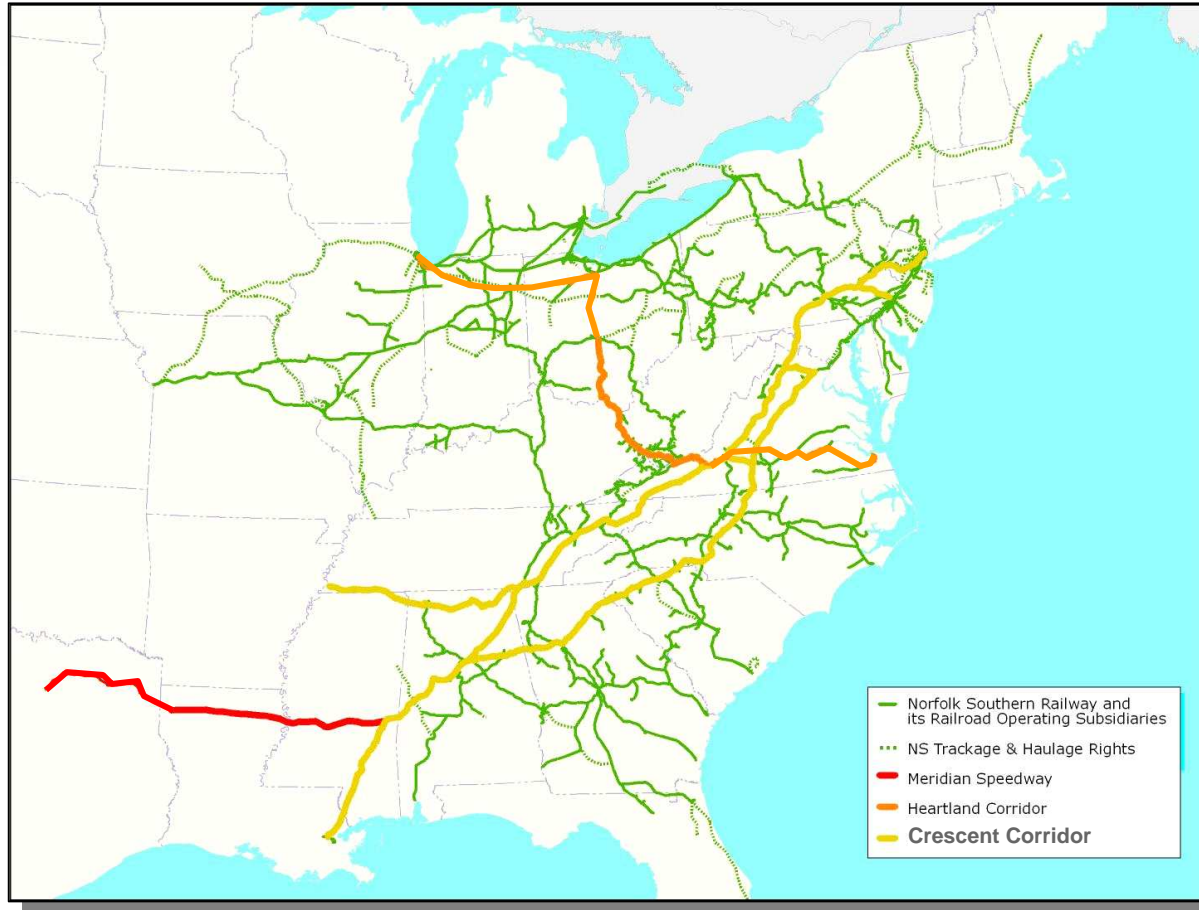
**Low =  
1,232,429/year**

## Maximum Feasible Diversion of I-81 Trucks to Rail Year 2035 transportation performance ratios

<i>Numerators</i> (in Columns) as a share of <i>Denominators</i> (in Rows)	<i>I-81 Trucks</i> (base case)	<i>Maximum Feasible I-81 Truck to Rail Diversion</i> ("real world" conditions)	<i>Maximum Feasible I-81 Truck to Rail Diversion Plus Baseline Rail Traffic</i> ("real world" conditions)
<b>I-81 Vehicles</b> (all types)	<b>32.9% to 36.7%</b>	<b>4.1% to 7.7%</b>	
<b>I-81 Trucks</b>		<b>12.5% to 20.8%</b>	
<b>I-81 Trucks Passing Through Virginia</b>		<b>18.2% to 30.3%</b>	
<b>Potentially Divertible Trucks</b> ("perfect world" conditions)		<b>28.6% to 47.6%</b>	
<b>Potentially Divertible I-81 Trucks Plus Baseline Rail Traffic</b> ("perfect world" conditions)			<b>43.2% to 58.3%</b>

# The NS Crescent Corridor Proposal

## *Part of a larger set of system-wide initiatives*

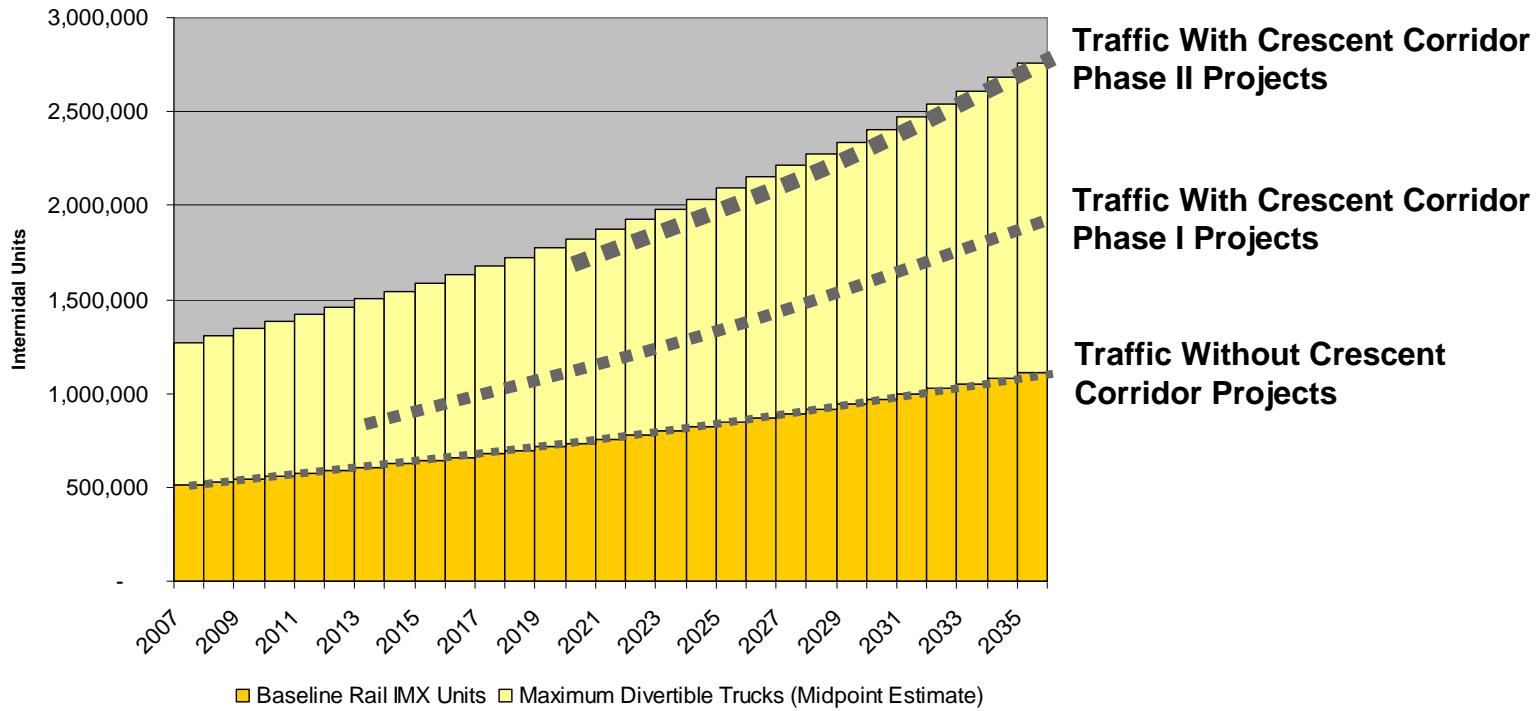


- **Meridian Speedway**
  - Connections to Gulf and Mexican markets, western railroads
- **Heartland Corridor**
  - Connections to Midwest markets, western railroads
- **Partnerships with other railroads**
- **Crescent Corridor**
  - Central spine from New Orleans and Memphis to Philadelphia and Northern New Jersey
  - NS proposed improvements in VA: passing tracks and double track segments on the Shenandoah and Piedmont lines for longer trains
  - Two phases

# The NS Crescent Corridor Proposal

*Would meet our estimate for Baseline Traffic and our midpoint estimate for Maximum Feasible Diversion*

Scenario and Annual Growth	2006	2013	2020	2035
Baseline System Traffic	500,000	607,000	736,000	1,113,705
Plus Diversion With Phase I CC Projects		210,000	400,000	720,377
Plus Diversion With Phase II CC Projects			520,000	936,491
<b>TOTAL</b>	<b>500,000</b>	<b>817,000</b>	<b>1,656,000</b>	<b>2,770,573</b>



Source: Norfolk Southern



# Cost and Benefit Analysis

- **Within Virginia**
  - Projects and costs currently being reviewed for “bang for the buck”
  - Benefits being quantified using DRPT model, which considers savings to pavement and other highway assets, environment, shipping costs, and other factors
- **Outside Virginia**
  - Total Crescent Corridor costs over all states estimated at around \$3 billion\* by NS
  - Costs and commitments still being refined
  - Virginia projects look to be 40% to 50% based on preliminary work in progress
- **Key questions**
  - Who benefits? NS, Virginia, other states, freight shippers and receivers throughout the country – argues for contributions from the railroad, multiple states, and federal gov’t
  - What if Virginia does not invest in the Crescent Corridor? We still benefit, but gain is limited to increases in “baseline traffic”
  - What if Virginia invests but corresponding improvements in other states are not made? Could limit the amount of traffic over the system and reduce Virginia benefit; rail system modeling might be able to quantify the effects

\* in current dollars

## Preliminary Findings

- 1. The findings of the I-81 Tier I EIS are substantially confirmed. The EIS estimated a maximum diversion of 1,224,500 units in 2035; our midpoint estimate is 1,643,239 units in 2035. With nearly 30 million vehicles on I-81 in 2035, the difference will not be significant.**
- 2. The NS Crescent Corridor proposal essentially captures the maximum feasible truck to rail diversion we have estimated. Traffic is captured not only from I-81, but also I-77 and other routes that are used in conjunction with I-81.**
- 3. To meet capacity needs through 2035, NS proposes improvements to both the Piedmont and Shenandoah lines. Beyond 2035, an additional project – the “Culpeper Cutoff” – may be needed. Alternatively, if improvements on the Shenandoah line are not made, the Culpeper Cutoff would be needed sooner. The Commonwealth has not evaluated the pros and cons of either the Shenandoah line improvements or the Culpeper Cutoff.**
- 4. NS will also need significant improvements in other states.**

## **Preliminary Findings** *(continued)*

- 5. Further work remains to value engineer the specific Crescent Corridor improvements, to assess the potential environmental effects, to define required projects in other states, to test the potential for federal participation, and to estimate the potential fair share contributions of NS and the Commonwealth. The results will be needed to arrive at go/no go investment decisions.**
  
- 6. If the project goes forward, several partnership structures are possible. Consistent with the Rail Enhancement Fund approach, potential structures include: (a) loan agreements; (b) performance contract grants, where the Commonwealth buys specified levels of diversion and the railroad returns funds if the targets are not met; and (c) performance contract grants that convert to loans with enough traffic.**

## **Preliminary Findings** *(continued)*

### **7. The following are suggested next steps:**

- (a) The Commonwealth should work to finalize and confirm demand estimates, costs, and benefits, and continue the necessary investigations to further advance understanding of the Crescent Corridor opportunity, in cooperation with Norfolk Southern.**
- (b) The Commonwealth should begin to explore federal funding support for Commonwealth rail opportunities and initiatives, including but certainly not limited to the Crescent Corridor.**
- (c) The Commonwealth should continue to coordinate with other Crescent Corridor states regarding multimodal issues and projects of shared interest.**
- (d) The Commonwealth should consider the value of undertaking a similar analysis of truck to rail diversion opportunities in the I-95 Corridor.**
- (e) The Commonwealth should continue work aimed at completing and releasing a draft report on Opportunities for Truck to Rail Diversion in Virginia's I-81 Corridor for public review.**

# Thank You

Questions, comments, suggestions?

