Mid-Atlantic Rail Operations
Phase II Study
Summary

December 2009
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Prepared for:

I-95 Corridor Coalition

Sponsored by:

Delaware Department of Transportation, New Jersey Department of Transportation, Pennsylvania Department of Transportation, Maryland Department of Transportation, Virginia Department of Transportation

I-95 Corridor Coalition

Prepared by:

Cambridge Systematics, Inc.

December 2009

This report was produced by the I-95 Corridor Coalition. The I-95 Corridor Coalition is a partnership of state departments of transportation, regional and local transportation agencies, toll authorities, and related organizations, including law enforcement, port, transit and rail organizations, from Maine to Florida, with affiliate members in Canada. Additional information on the Coalition, including other project reports, can be found on the Coalition's web site at http://www.i95coalition.org.
Summary

The MAROps Phase II study examines the condition and performance of the regional rail system, updating the findings of the 2002 MAROps Phase I study. The studies are part of the continuing initiative of the I-95 Corridor Coalition, five Mid-Atlantic states (Delaware, Maryland, New Jersey, Pennsylvania, and Virginia), and three railroads (Amtrak, CSX, and Norfolk Southern) to understand the impact of rail choke points on rail freight transportation and the economy of the region.

The study finds that the Mid-Atlantic region faces clear challenges to moving freight in the future. The population of the five-state area is projected to grow from 36 million in 2008 to nearly 45 million in 2035 and employment is expected to grow from 23 million jobs to 31 million jobs. With these changes will come a significant increase in demand for freight transportation to support businesses, households, and government services.

The national and regional economies are weathering a major recession today that has reduced demand across all freight transportation modes, but the eventual economic recovery will quickly return the freight system in the Mid-Atlantic region (and the nation as a whole) to where it was in 2007 and early 2008—in the early stages of a capacity crisis. The current fiscal climate encourages state transportation agencies and the railroads to put off challenging questions and long-term investment in favor of addressing short-term needs. But without coordinated planning and additional investment, significant congestion can be expected in the future on both the rail and highway systems. This is especially true for the region’s rail system.

Today, 88 percent of freight rail corridor miles in the MAROps region operate below capacity (at levels of service A, B, or C) and only three percent operate above capacity (at level of service F). Figure S.1 maps the current levels of service (LOS) on the Norfolk Southern and CSX freight rail corridors.

Without further improvements to the rail system, by 2035 only 43 percent of rail corridor miles in the MAROps region are projected to operate below capacity (at levels of service A, B or C), while 30 percent will operate above capacity (level of service F). Figure S.2 maps the levels of service on the Norfolk Southern and CSX freight rail corridors in 2035 without the MAROps improvements and assuming no increase in rail mode share.
Figure S.1  Current Freight Rail Levels of Service, NS and CSX Corridors
Figure S.2  Freight Rail Levels of Service by Corridor for Future Without MAROps Improvements and No Increase in Rail Mode Share, NS and CSX Corridors, 2035
Implementing the full MAROps program, estimated to cost about $12 billion over the 30-year period (up from $6.2 billion in 2002 MAROps Phase I study, largely because of the increases in energy and material costs), would maintain the capacity of the system. The program would involve implementation of 217 projects, including 110 projects to add mainline capacity and 81 projects to provide doublestack clearance. There would also be projects to expand terminal capacity, remove or rebuild grade crossings, replace or rehabilitate outdated bridges and tunnels, and add new communication and technology to improve safety and the coordination of train movements. Figure S.3 maps the location of the MAROps rail improvements.

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1 Amtrak is currently developing a Northeast Corridor master plan, which will identify improvements to the NEC to provide improved passenger service for Amtrak and the commuter railroads. To avoid duplication, the MAROps Phase II study focuses on freight improvements in the Northeast Corridor; however, the Amtrak and MAROps reports have been closely coordinated because Amtrak is a partner in the MAROps studies. Several projects appear in both the MAROps and the Amtrak programs because they are mutually beneficial to freight and passenger rail services.
Figure S.3  MAROps Rail Improvements
The MAROps projects would significantly improve the levels of service in 2035 compared to the without MAROps scenario. Figure S.4 maps the levels of service for each rail line.

Figure S.4  Freight Rail Levels of Service by Corridor for Future With MAROps Improvements and No Increase in Rail Mode Share, NS and CSX Corridors, 2035
The improvements address most of the future capacity challenges identified in the without MAROps scenario. Overall, 81 percent of the network operates below capacity, compared to 43 percent without the MAROps improvements. However, even with the full set of MAROps improvements, there are capacity constraints at several locations, including at the Howard Street Tunnel in Baltimore, in the Washington, DC area, along sections of the Northeast Corridor used by freight trains near Wilmington, and in the Philadelphia area.

Increasing the capacity of the network has the potential to increase the share of freight captured by rail. The rail share of freight transportation in the Mid-Atlantic region is between one and two percent lower than the national average. Conservative estimates of the potential to shift freight from truck to rail suggest that rail could capture the equivalent of 13 to 55 additional trains per day. This shift would remove a moderate amount of truck traffic from the region’s highways, relieving some of the congestion pressure on the highways.

The additional traffic would—as intended—absorb some of the capacity provided by the MAROps improvements. With implementation of the full MAROps program and the high increase in rail mode share, 70 percent of the rail corridor miles in the region are projected to operate below capacity by 2035 and 6 percent would operate above capacity. Figure S.5 maps the levels of service by freight corridor and segment.
Figure S.5  Freight Rail Levels of Service by Corridor for Future With MAROps Improvements and High Increase in Rail Mode Share, 2035
Implementing the 150 priority MAROps improvements—the projects judged by railroad managers and state DOT officials to be critical path projects—would reduce program costs from $12 billion to $6 billion. Although the rail system would not have sufficient capacity to attract and absorb as much new traffic as would under the full program, it would still capture a moderate amount of new freight traffic. Figure S.6 maps the location of the priority MAROps rail improvements. Implementing only the priority projects and assuming the low increase in rail mode share, 57 percent of the MAROps rail system would operate below capacity and 19 percent would operate above capacity. Figure S.7 maps the LOS by corridor and segment.
Figure S.6  Priority MAROps Improvements
Figure S.7  Freight Rail Levels of Service by Corridor for Future With Priority MAROps Improvements and Low Increase in Rail Mode Share, NS and CSX Corridors, 2035
Figure S.8 summarizes the levels of service for the five scenarios.

- Current freight rail levels of service;
- Future without MAROps improvements and no increase in rail mode share;
- Future with MAROps Improvements and no increase in rail mode share;
- Future with MAROps Improvements and a high increase in rail mode share; and
- Future with priority MAROps Improvements and a low increase in rail mode share.

The green bars represent the percentage of the MAROps rail network that are below capacity, the yellow bars represent the percent that is near capacity, the orange represent the percent that is at capacity, and the red represent the percent that is over capacity. The figure shows the significant deterioration in service without the MAROps improvements, the capacity gained by implementing the MAROps projects, and the capacity absorbed by a low and high increase, respectively, in rail mode share. The figure also makes clear that rail capacity must keep pace with population and economic growth beyond 2035.
Implementing the full MAROps program would contribute $1.3 billion in business output and 9,800 jobs to the five-state region each year. Table S.1 summarizes the projected change in business output, employment growth, and wage income by state and major metropolitan area between a future without MAROps improvements and no increase in rail mode share conditions and a future with MAROps improvements and a high increase in rail mode share. Shippers would see a modest reduction in transportation costs (around 1 percent), railroads would carry additional freight, increasing their revenue, and freight operators would see overall net reductions in costs of $40 and $52 million per year in operating costs.

Table S.1  Estimated Economic Benefits of Future With MAROps Improvements and High Increase in Rail Mode Share, 2035

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<thead>
<tr>
<th>State/Region</th>
<th>Business Output ($ million/year)</th>
<th>Value Added ($ million/year)</th>
<th>Jobs (per year)</th>
<th>Wage Income ($ million/year)</th>
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<tbody>
<tr>
<td>Delaware</td>
<td>$75</td>
<td>$36</td>
<td>583</td>
<td>$28</td>
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<tr>
<td>Maryland</td>
<td>$371</td>
<td>$202</td>
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<td>$152</td>
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<td>$75</td>
</tr>
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The benefit/cost ratio of implementing the full MAROps program and achieving a high increase in rail mode share is estimated at 1.86. The benefits include traveler benefits, shipper benefits, and societal economic benefits.

The benefit/cost ratio of implementing only the priority MAROps improvements while achieving a low increase in rail mode share is estimated at 2.9. The ratio is greater because implementing only the priority MAROps improvements would defer several of the highest-cost and most complex improvement projects. Both programs would generate economic growth in all five states and the three major metropolitan areas within the region.

The findings of the MAROps Phase II study reinforce the conclusions of the Phase I study, which found that cooperative action between the states and railroads is critical to improving the system. The MAROps rail network covers five states and serves three major metropolitan areas, each its own jurisdictional roles and responsibilities. However, the network is operated as a system. Improvements in one state alone, while beneficial, would simply shift choke
points upstream or downstream and would not necessarily improve overall corridor capacity and travel times. A coordinated program of state- and railroad-funded improvements is needed across the network if rail capacity is to be increased and freight traffic shifted from truck to rail.

The MAROps Phase II study also confirms the need for a national support for major rail improvement projects. The MAROps projects range in complexity from relatively simple fixes to extremely complicated and costly projects such as the multi-billion-dollar Baltimore rail tunnel improvements. The states and railroads can address many of the smaller, less costly projects over time, but national action will be required to accomplish the major projects.

The major projects will benefit the region, but they also will improve rail freight and Amtrak passenger rail operations between the Mid-Atlantic and the Midwest, the Southeast, and the West Coast. The full set of MAROps improvements will encourage long-haul truck traffic to shift to improved rail intermodal service. This will reduce logistics costs for shippers and highway congestion across the country, not just within the MAROps region.

In summary, without concerted action to implement the MAROps improvements, the capacity of the rail system will lag behind population and economic growth. Rail freight will be shed to trucks, adding congestion to the region’s already overloaded highway system. The cost of freight transportation in the region generally, and the cost of rail freight transportation specifically, will increase. This will drive up the cost of living and cost of doing business in the region, reducing the economic competitiveness of the region in national and global markets. The Mid-Atlantic is one of the nation’s largest and most important population and economic regions. It must have balanced and cost-effective freight and passenger transportation system. For these reasons, its is recommended that the I-95 Corridor Coalition, its member states, and the railroads advance the MAROps program and look for opportunities to accelerate implementation of the projects.