Project Summary

Texas Department of Transportation

0-4410: Containerized Freight Movement in Texas

Background

Congestion along key Texas highway corridors has continued to rise in recent years due to increases in usage by both passenger and freight vehicles. In addition to building new lane miles, the Texas Department of Transportation (TxDOT) is attempting to manage the growth in total demand for roadway space and so mitigate congestion. Significant improvements in overall traffic flows could be achieved by diverting even a modest share of the intermodal cargo currently traveling over highway corridors to alternative modes. However, since the freight industry is privately controlled, there is comparatively little known about the impact of intermodal freight movements on traffic within the state. Researcher objectives in project 0-4410 were to investigate how intermodal containers move throughout the state, examine options for diverting a percentage of these containers from highways to other modes, display available data using a GIS platform, and evaluate the potential for diverting containerized traffic.

What the Researchers Did

The vast majority of intermodal containers enter the state through a small number of key gateways. Around two-thirds of the total three million international containers that enter Texas do so by rail and are then transferred to truck chassis at inland rail terminals in the state for final delivery. The rest, with the exception of a small number of interstate trucking moves, enter via Texas seaports which are currently dominated by Port of Houston facilities.

Through interviews and collection of secondary data, researchers gathered information on the inland distances that the containers travel after arriving at the Houston port. An origin/destination (O/D) matrix was created using the number of gate interchanges and container O/D information obtained from a recent URS Corporation study.

After examining the maritime origins of intermodal containers entering the state, the researchers tracked truck flows throughout the state by referencing several databases. One of the best sources of data on truck and rail container moves, the Transborder Surface Freight Database, shows that rail accounted for an average of 35 percent of total container moves across the border. The true share of rail may actually be higher since a large number of containers are drayed across the border to intermodal yards and actually traverse the state by rail. Data was also collected on the breakdown between loaded and empty containers.

Research Performed by:

Center for Transportation Research (CTR),
The University of Texas at Austin

Texas Transportation Institute (TTI),
The Texas A&M University System

Research Supervisor:
Robert Harrison, CTR

Researchers:
Chandra Bhat, CTR
Jolanda Prozzi, CTR
Curtis Morgan, TTI
Stephen Roop, TTI
Jeffery Warner, TTI

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The researchers used a Fractional Mode Split Freight Distribution Model to predict how containers move on Texas road and rail networks. Two different conversion factors were developed: to convert total commodity tonnage to containerized tonnage and containerized tonnage to the number of containers. The TransCad GIS platform was used to evaluate containerized mode split under different scenarios.

What They Found

In general, the available data on statewide container movements was deemed to be insufficient to model in a comprehensive fashion. Therefore, until more comprehensive metrics can be collected, policy recommendations must be made relying on a combination of regional modeling plus information collected from surveys and interviews.

Recent state legislation now allows TxDOT to work with railroad companies to improve facilities and systems where there are clear transportation benefits. Researchers identified numerous potential public-private partnership (PPP) opportunities.

What This Means

Focusing specifically on Texas legal structures, the researchers devised three possible scenarios under which a PPP could result in modal shift for intermediate haul freight. In option one, funds are provided to subsidize rail companies so that they can charge competitive rates with trucking companies over distances between 500 and 700 miles. The second option is to use TxDOT or federal funds to make track improvements in a specific corridor, thereby achieving transportation benefits that have statewide or national benefits. Finally, there is the possibility of using the Texas Mobility Fund or GARVEE bonds for PPPs. The availability of such bonding programs to provide rail infrastructure to relieve urban congestion is an option that may appeal to the fund's users. A larger variety of PPP forms may become viable as new financial tools become available.

In general, containers seen on Texas highways are there for distinct economic reasons – reasons that preclude taking them off the highways and moving them by rail. The situation might be different if social costs and benefits were included in transportation pricing, but that is unlikely in the short run. Accordingly, the goal of TxDOT planning should be to work with railroad companies to maintain rail corridor and terminal efficiencies. Some transportation corridors within Texas are already congested or are approaching the limits of their capacity. Therefore, planners must keep two goals in mind: ensuring that improvements to rail corridors are sufficient to maintain their traditional clients, and persuading shippers to choose alternative modes for traffic currently dominated by trucks. The right balance of incentives will ensure that the growth of freight transportation will not impede overall mobility and quality of life within Texas.

For More Information:
Research Engineer - Duncan Stewart, TxDOT, 512-465-7403
Project Director - Raul Cantu, TxDOT, 512-416-2344
Research Supervisor - Robert Harrison, CTR, 512-232-3113

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Texas Department of Transportation
Research and Technology Implementation Office
P.O. Box 5080
Austin, Texas 78763-5080
512-465-7403

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