Information

For the

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Provided by:

Stephen S. Roop, Ph.D.
Assistant Director

Texas Transportation Institute
The Texas A&M University System
College Station, TX

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MULTIMODAL FREIGHT

Texas has a well developed and efficient multimodal freight transportation network, comprising rail, trucking, ports, inland waterways, air and pipeline networks. As in most other states, trucking dominates the goods movement industry in Texas, accounting for almost half of the ton-miles (44%) and carrying 60 percent of the total value of freight transported, or more than $690 billion. Railroads transport more than a third of the ton-miles for freight valued at more than $75 billion. Ports and waterways contribute to the freight balance in the State with the Port of Houston ranking as the largest port in the US in terms of import tonnage. The Gulf Intercoastal Waterway moves 13.5 billion ton-miles or 5.3 percent of the goods and material transported to, from, and within Texas.¹

Each mode has its strong points and its core markets. The freight transportation industry is characterized as a cost-minimizing, highly competitive, and low-margin industry. Freight has a tendency to flow along paths defined by the lowest cost and shippers select from the combination of modes and routes available to them based largely on price and service levels. The competitive nature of freight transportation has the effect of making customer and rate information proprietary and closely held, so that policy-makers often have less than complete and current information from which to formulate sound public policy. Other facets of the industry are more accessible, however, such as the energy and air quality impacts of modes, their safety implications and long term sustainability.

The energy efficiency and environmental advantage of rail over trucks are well established in terms of metrics like gallons and emissions per ton-mile of freight. Facilitating greater use of freight rail is emerging as an important national strategy with a dual goal: protecting the public welfare and at the same time reducing the necessity for highway expansion as funds for transportation programs are diminishing. An extension of this real “win” for the public sector will be in public-private projects aimed at increasing the market share that rail carries in congested corridors, thereby giving back scarce highway capacity to passenger traffic and, perhaps most importantly, slowing the wear and tear inflicted by heavy trucks on the highway infrastructure that is already in place.

The challenge will be to identify how to best accomplish the shift in goods from fast and flexible trucks to a rail system that is inherently less flexible. Certain commodity groups are amenable to this shift, but the precise parameters that define modal shift in specific locations are not well or universally understood. Cost is a prime factor, but total cost includes a time-based element and must also account for service variability, which rail has a harder time controlling, than do trucks. Further, the economic service radius for rail begins at between 500 and 700 miles. Rail is the long-haul carrier of choice, but 80 percent of the goods travel less than 700 miles. This short and intermediate-distance segment is completely dominated by trucking.

Public private partnerships (PPPs) can be a valuable tool in leveraging scare resources to the mutual advantage of both railroads and the public sector. The formalization of PPPs and the development of

methods for assessing the accrual of benefits to the participating parties should be a central focus in advancing this promising avenue of transportation infrastructure enhancement.

AGRICULTURAL TRANSPORTATION

Agricultural products have 2 significant characteristics working against them that make transportation of produce an on-going challenge:

1. By definition, Ag products are produced in a geographically dispersed manner, with collection of the product and processing being a central challenge. When this is coupled with shifting global markets\(^2\) for produce and the need for responsive shipping to ensure the appropriate timing of delivery and to garner the best prices, the task associated with collecting and distributing agricultural products is daunting.

2. Ag products are seasonal and within the cycle of production, there is variation that makes planning for transportation service a challenge.

Transportation providers look for almost the opposite characteristics in service design in order to maximize the efficiency and profitability of their operations. Regular service at defined intervals between high-volume nodes makes economic sense for transportation systems that depend on consistent revenue streams for responsive, low-cost service. The agricultural sector must develop strategies that adhere to these realities for cost effective and reliable service.

Several states have initiated programs that attempt to address these needs. The State of Washington has purchased railroad rolling stock that can be dedicated to the seasonal transport of grain in the Eastern regions of the State. Several states have initiated short line railroad assistance programs to achieve a greater level of responsiveness and availability. Marine and waterway transport of agricultural products is highly efficient in those regions where it is available and makes sense. Texas should look to a combination of programs like these to provide a responsive transportation option for agricultural shippers.

Speaking to these same issues, the National Grain and Feed Association supports several rail transportation-related initiatives. Among these are policies that facilitate discussion of rail rates and fuel surcharges, but most significantly, support railroads investment tax credit for investment in infrastructure.

The issues involved are complex. Dialog, collaborative goal setting and improved communications are recommended as steps to continue to pursue to improve the critical transportation link between our agricultural producers and carriers.

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\(^2\) The cotton market is a case in point. Historically transported to the Southeastern US, most domestic cotton (> 70%) is now exported in containers, largely to the Pacific Rim (Stephen Fuller, personal communication, 2010).
TTI’s FREIGHT SHUTTLE

The Freight Shuttle is a new intermodal freight transportation system that will alleviate truck-induced congestion and reduce emissions, while greatly enhancing the freight movement capacity in many congested, domestic highway corridors in the US. It is being developed and implemented as a privately-financed and privately-operated enterprise based solely on the commercial merits of its superior performance and cost to users. The Freight Shuttle system, protected by US Patent 7654203, is composed of three primary components: transporters, guideways, and terminals linked by a command and control system. Figure 1 shows the interaction between the transporters and elevated, bi-directional guideway.

![Transporters: Trailers or Containers](image)

**Figure 1** – TTI’s Freight Shuttle Operating on an Elevated Bi-directional Guideway

The transporters, best characterized as *driverless* electric trucks, are engineered to operate as autonomous-units. They employ steel wheels on a steel running surface, like railroads, but operate as single units with single loads like over-the-road trucks. Freight Shuttle transporters operate at speeds up to 100 kph and are designed to accommodate either containers or semi-trailers, eliminating the need to reconfigure freight loads within the terminal prior to departure. They are designed with a rotating cargo bay that allows trailers to be driven directly onto the platform. Containers, on the other hand, can be lifted onto the transporters using standard overhead cranes. The transporters are powered by linear induction motors (LIMs), which do not produce a torque, or rotation, as a created by a conventional motor, but instead produce a linear force. LIMs make efficient use of electric power, enabling Freight Shuttle Systems to draw from any available source of energy, including renewables.

Transporters travel along a specially-designed guideway built in the medians of existing highways, railroad lines or other right-of-way. The guideway will be financed and constructed as a capital expenditure for each Freight Shuttle system being implemented. Figure 1 shows the raised guideway structure. Because the guideway’s footprint is only 4-6 feet in width (enough area for individual support columns), the System can make use of existing transportation rights-of-way, such as a highway median for example, eliminating the need to acquire new rights-of-way, and thereby facilitating the system’s implementation in key corridors. A dedicated, grade-separated guideway, segregating freight from
passenger traffic, also enables full system automation because roadway traffic, pedestrians, animals, or other interfering elements cannot interact with the System. Another key aspect of the guideway design is off-site pre-fabrication which means lower manufacturing costs and a much faster construction process, as compared to onsite construction.

![Elevated Freight Shuttle Guideway](image)

**Figure 1** - Elevated Freight Shuttle Guideway

Transporters move into and out of carefully designed terminals, linked by the bi-directional elevated guideway. The terminals are configured so that when combined with the Freight Shuttle’s scheduled operating plan, which distributes traffic evenly throughout the day, the system avoids surges in traffic and hence congestion – even at high levels of utilization. This zero-congestion operating plan ensures that the Freight Shuttle system will not be subject to the same kinds of unanticipated, unavoidable delay experienced on highways and in traditional border crossing environments. The terminals are designed to accommodate both containers and trailers and are applicable to intermodal operations within landside ports of entry, marine terminals, or intermodal facilities.