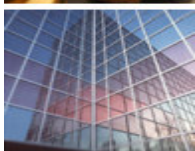


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Technologies to Watch *Use of Linear Induction Motors to Move Container Cargo, Address Port and Transportation Infrastructure Capacity Crunch*

What is it: A Linear Induction Motor (LIM) is similar to a standard motor, but laid flat. The idea, proposed by a company called [Skytech Transportation](#) is to use this technology to move containers and even whole tractor-trailers down monorail like tracks through the electromagnetic energy LIMs create, in some cases in a levitated (frictionless) mode. The promise is substantially reduced costs per mile to move freight, reduction in pollution and traffic congestion, faster cycle times in handling and delivering cargo.

LIM technology is used in several commercial applications today, such as thrill rides, and is being considered to launch the U.S. space shuttle and to propel aircraft off the decks of carriers. Skytech has licensed proprietary LIM technology created by George Scelzo and his company PRT systems, which is pursuing the space shuttle and other projects, and adapted it to cargo movement.

Why could it be important: U.S. cargo capacity is already strained, and experts expect container traffic coming from overseas to double by 2010. While everyone recognizes the growing capacity crunch and transportation infrastructure challenges in the nation's ports, highway system, and rail lines, there has been more hand wringing than actual solution proposals. Additional port capacity is very difficult to secure. Most estimates are that improved scheduling and other enhancements will only increase rail capacity by 50-75 percent – not enough to meet rising demand. Additional highway construction is extremely expensive, slow and beset with right of way and other political problems. Rising fuel costs and a desire by many to get trucks off the road contribute to the challenge.

This technology offers advantages that would circumvent many of these problems.



How would it work? Skytech's idea is to build a 50-foot high concrete structure that would use LIM technology to pull containers and even tractor-trailers both above and below the structure. On the bottom side, after acceleration, Skytech says the containers would actually levitate, dramatically reducing the energy required to move them. Containers and trailers would actually move on chassis or "shuttles" that are propelled by the LIM motors.

Skytech calculates that it can get a 90,000 pound container moving at speeds of 70 miles per hour in 300-400 feet.

Sophisticated software and controls, both to track the container movements, the current flow, and manage things like stopping a container if needed, will of course be required. Skytech maintains that the bulk of this software/control development is already done.

Benefits of the technology:

- ❑ Low operating costs: The estimates are costs of .47 cents per miles, well under rates for other modes of transport. Skytech is proposing a system to move containers from Chicago's Corwis rail yard to the 47th St transfer station, a 4.17-mile trip it says could be accomplish much faster than today's truck drayage system, due to direct transfer from the rail cars to the transport structure, and at a cost to move of \$70, versus the average \$200 drayage cost incurred today.
- ❑ Near pollution free.
- ❑ Speed and consistency: faster movement from ships or trains to the infrastructure, less variability factors en route.
- ❑ Right of way: the plan calls for building these structures over the top of existing rail lines/right of ways.
- ❑ Reduce highway congestion.

Short and long-term plans: Skytech is in conversation with several bodies regarding primarily short-haul projects (such as the Corwis to 47th St. station in Chicago). Ultimately, it projects it could build LIM structures, nearly all over the top of existing rail lines, covering over 13,000 miles across the U.S. Skytech is also operating in other countries pursuing similar opportunities. It talks of plans stretching out to the year 2040.

Skytech's immediate aim is to secure funding to develop a 4000-foot test track at Colorado's Transportation Technology Center. The goal is to provide visual evidence of the technology at work and to support its operating cost per mile estimates. It hopes to complete the pilot in 2005.

Risks and prospects: The good news for Skytech is that the basic LIM technology is decades old and proven in several commercial markets. The interest of NASA, the DoD and others for

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even more challenging applications would seem to support the idea that cargo movement is feasible.

There will be many competing alternatives, and as the government will likely be involved in many of these projects in some fashion, logic may not always be the primary driver. It is important to note that Skytech is focusing on private investment to build its infrastructure, a stance made possible by plans to use existing rail right of ways. This would in some cases put drayage carriers out of business, and as such may be strongly opposed, although the belief is that there will be enough freight movement business for everyone as volumes continue to expand.

This obviously then brings the question of how the railroads will view this – Skytech believes it can partner with the major railroads to jointly deliver transport services over their tracks. Like the rail lines moving to double stacked cars, this proposal will have to solve problems associated with limited overhead free space – such as tunnels.

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