

The promise of new technology



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Interest is growing in alternative technologies to move freight — fueled in large part by community pressure stemming from concerns about diesel pollution. The freight industry is intrigued by the prospect of faster and more efficient movement of goods.

Technology proposals include:

- Systems driven by linear-induction motors, either with or without magnetic levitation.
- Dual-mode trams that run on guideways or streets, driven by wheel-mounted rotary electric motors.
- Electrically driven automated guided vehicles that can run on fixed guideways or within terminals.

Alternative technology concepts cover a wide range of designs and operating modes. Some are envisioned to run at ground level, while others would be elevated so as to avoid conflict with surface transportation. Some concepts would require special infrastructure, such as guideways or support stanchions, while others could make use of existing roads or rails. The estimated costs of segment or system construction vary widely depending on the concept.

Nearly all alternative technologies feature electric drive, meaning that they have “zero emissions” at the source. The electricity, of course, still must be generated and supplied, but it can be produced using cleaner or alternative options, and it is easier to control power plant emissions than those from individual vehicles.

The relative energy needs of innovative and traditional technologies still must be investigated. To be sure, traditional rail and truck technologies are getting cleaner, but may not get

close enough to zero to provide sufficient emission reductions from the goods movement sector.

A number of public initiatives are examining the operational and environmental promise of new technologies. The ports of Los Angeles and Long Beach are conducting an Advanced Cargo Transportation Technology Evaluation and Comparison focused on movement between the ports and near-dock intermodal yards. The Southern California Association of Governments is expected to conduct a similar study, but with a regional and systemwide scope.

The Gateway Cities Council of Governments — home to the San Pedro Bay ports and much of the rail and highway infrastructure that serves them — has taken an active interest in alternative technologies. Community groups in the Gateway area agreed to an increase in the capacity of the much-traveled I-710 freeway on the condition (among others) that the environmental impact study include an evaluation of alternative technology options for this corridor.

The New Jersey Department of Transportation sponsored an evaluation of alternative freight movement technologies, completed in 2004, that could provide a preview of results in Southern California. The study applied 13 criteria, covering a broad range of operational, economic and environmental factors, to four innovative technologies as well as truck and rail. It examined transportation to four inland locations ranging from about 3 miles to nearly 10 miles from Port Newark-Elizabeth. The study concluded that innovative technologies could be used for efficient inland

container transportation, with economies of scale emerging at higher container volumes.

A current focus of Southern California efforts is to determine objectively how best to spend the region’s funds on a technology demonstration project. One major question is how innovative line-haul technologies will interface with terminal operations. Another is whether it will be possible to phase in construction and operation without disrupting current business practices.

The key uncertainties, of course, are economic. Depending on the assumptions made regarding costs such as construction and right-of-way, investments in alternative technologies can look competitive. A demonstration project should help refine current understanding of likely construction costs. It also could shed light on the economics of eventual operation.

Bottom line: These innovative technologies will be costly to implement. It is unlikely they will be pursued unless they offer true and substantial improvements in the productivity of freight transportation. Put another way, as attractive as the emission reductions are, they alone would not be reason enough to invest in alternatives. Thus, the current Southern California evaluations will be critical in determining just how much promise these new technologies hold — for the industry and the affected communities.

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