CCDoTT Acts as a Concept Clearing House for the Diverse Interests in our Community and Provides an Unbiased Assessment of Technologies that Benefit the Local Economy

Efficient Marine Terminal (EMT)

terminal

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Efficient Marine Terminal (EMT)

Terminal

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Why... Maintain Economic Base by Increasing Port Capacity to Handle Projected Container Surge

- Port growth provides regional economic prosperity
- 1 out of 7 local jobs are directly related to the Port of LA/LB
- Port growth continues to produce good paying logistics jobs while supporting Southern California manufacturing base
- State derives significant income from leasing port acreage
- Supports national defense initiatives
- Half the nation’s imports pass through the ports of LA/LB

But... Port Growth is an Issue of Container Throughput not Physical Size

Why... Reduce Stress on Southern California’s Congested Infrastructure

- Moving containers from our port increases port capacity but places pollution and congestion burden on the whole community
  - Truck traffic and congestion around the Ports
  - Truck traffic and congestion along freeway corridors to In-land Empire, Cajon Pass and Beaumont
- Productivity lost due to freeway congestion in Los Angeles is estimated at $14Billion/year*
- Economic and human cost of new freeways prohibitive

*Texas Transportation Institute
Why… Improve Quality of life

- Over the last decade, studies from all over the world have shown spending time in close proximity to Diesel vehicle traffic causes:
  - Wide range of health impacts
  - Increased mortality

- Studies also show that locating homes within 650 feet of major Diesel arteries and facilities can lead to “elevated exposures to deleterious particles”

- In response to these health threats, the California Legislature passed a law prohibiting new schools closer than 500 feet from a freeway

- Diesel Particulate Emissions (DPE) could require:
  - 1000 feet rights-of-way for future freeway and rail expansion
  - Stop conventional infrastructure growth

Moving Containers From Our Port Increases Port Capacity But Places Pollution and Congestion Burden on the Whole Community

- Truck traffic and pollution in the Port Community
- Truck traffic and pollution along freeway corridors to Inland Empire, Cajon Pass, and Beaumont
Maglev Presents Win-Win for the Community

Regional Quality of Life

Regional Economic Prosperity

Maglev Technology

Solution: Maglev “Green Machine” Applicable to Different Requirements

- Utilizes frictionless magnetic levitation technology (Maglev)

- Off-the-shelf technology
  - TransRapid’s High-speed Freight Maglev system commercially viable in Shanghai enhances Alameda Corridor West (present) and East (future).
  - General Atomic’s Urban Freight Maglev full-scale test track proven American concept conveyor belt provides dedicated express feeder lines from terminals to Alameda Corridor ICTF’s and railheads.

- Incorporates CCDoTT’s EMT (Efficient Marine Terminal) and “on-dock” Maglev concepts—accommodates distribution of containers

- Elevated guideway; small footprint—less stress on infrastructure

- Negligible air and noise pollution—enhanced quality of life
ElectroMagnetic Suspension (EMS) Technology
TransRapid’s High-Speed Freight Design

CCDoTT Southern California Freight initiative:
Transrapid RCM System
Inland Empire Route: Track Scheme / Propulsion Layout (schematic layout, not to scale)
High-Speed Maglev in the Alameda Corridor

Click to play TRI's video

Principles of Levitation, Propulsion and Guidance

- Magnets are arranged in Halbach Arrays
- Track consists of transposed conductors
- Fields are focused on the track, cancellation occurs on back side
- Motion of magnets drives currents in track
- Currents react against magnet fields to produce lift

Courtesy of General Atomics
Chassis Unit Details

Guideway Structure

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<th>GIRDER LENGTH (Meters)</th>
<th>FREQUENCY (Hz)</th>
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W = 2477 lbs/ft

W = 1321 lbs/ft

Courtesy of General Atomics
Urban Maglev for Terminal to ICTF Conveyor

Incorporates CCDoTT’s EMT (Efficient Marine Terminal) and “on-dock” Maglev Concepts

CCDoTT Funded ‘04 Research on High-Speed Freight Mover

- CSULB College of Engineering with its research partners has performed a technology and economic study of Maglev feasibility.

- Orangeline Development Authority with Transrapid International (TRI) has provided:
  - Preliminary design and costs based on TRI’s china and german experience
  - Projected energy and operating costs

- Automation Associates has provided:
  - 1st Order Model of Port of LA/LB
  - 1st Order Model of inland intermodal terminus

- Manalytics has provided:
  - Cost comparison of container movement through corridor by various means
  - Capacity information relative to Southern California infrastructure for model calibration
'04 Findings: TransRapid’s High-Speed Technology

- Investigated State-of-the-Art **Dedicated Express Container Transport** from the Ports to an inland empire container terminal with branch lines to Victorville (BSNF) and/or Beaumont (UP)
- Increased speed and capacity **accommodates** port growth and efficiency, with minimal impact on existing infrastructure cost.
- **Separates** inland container flows from other transport users - commuters, local deliveries, bulk cargoes, etc.
  - Decreases container traffic on LA freeways
  - Minimizes future freeway expansion costs
  - Alleviates commuter and military surge congestion
- Potential processing location at Victorville for **military movement**
- Container transfer/storage utilizing **lower cost warehouse and trans-shipment facilities** in the inland empire as well as Victorville and Beaumont
- Moves **5.8 million containers** a year out of the port with **Minimal Air and Noise Pollution**

(Map Courtesy of DeLorme, Topo USA 5.0 2004)
Maglev Offers Exceptional Transit Times and The Lowest Operating Costs

- Transits time from Port to inland transshipment facilities:
  - Rail: 12 hours
  - Road: 8 hours
  - Maglev: 1 hour

- Estimated operating cost port to inland inter-modal:
  - Rail: $450
  - Road: $300
  - Maglev: $100

Maglev Capital Costs Are Competitive With Other Modes

- Initial estimates are that Maglev capital cost is within range of other modal upgrades, while offering better transit time, lower operating costs, zero pollution and other benefits.

- Capital cost estimates:
  - Maglev - data from TRI
  - Rail - Alameda like corridor based on construction cost of Alameda Corridor
  - Road - truck expressway/lanes based on cost of proposed I-710 truck expressway
CCDoTT ‘04 Investigation on High-Speed has Expanded to ’05 Urban Maglev Systems

- Due to increased attention to the million + truck trips per year moving containers from the gates of the terminals to the proposed new BNSF ICTF and the existing truck traffic to the existing UP ICTF, the opportunity to put the first phase of the Maglev system has materialized.
- Earliest, most beneficial application for Maglev Technology is the feeder system from terminals to ICTF’s.
- In reality Urban Maglev eliminates short haul trucking from terminal to Alameda Corridor ICTF’s and railheads.
- It provides a feeder system to get containers out of the port that will eventually be part of larger and more comprehensive Maglev Freight System.

’05 Urban Maglev Systems Preliminary Findings

- With an increase in capacity, Maglev would greatly enhance the economic viability of the Alameda Corridor.
- Increase in container throughput and port productivity would be achieved.
- Large reductions in harmful Deisel Particulate Emissions (DPE) would be attained.
- Truck costs of approximately $125 (+$90 lift costs) could be reduced by $100 with freight Maglev—more if terminal container movement vehicles are outfitted with Maglev hardware to reduce lift-on/lift-off costs.
- Capitol costs presently the subject of a joint GA/CSULB proposal, as well as more detailed operating costs.
Guideway to the Future, ’05 CCDoTT Program

- Projection of Maglev technology unto Port Infrastructure: College of Engineering and General Atomics will perform preliminary design of Maglev Connecting Terminals to Alameda Corridor
- Marketing Study – AAI and Manalytics will determine who will use the Maglev system, how much will they use it, and how much they will pay
- Business plan – Manalytics and CSULB to explore public/private financing structures and identify construction consortia
- Continued Outreach – CSULB will continue to build public consensus and to identify Institutional, Commercial and Governmental Stakeholders

Let us have MagLev

A little psychology gets us on board for this port pollution solution.

State Sen. Alan Lowenthal, who in the real world once was a professor and \textsuperscript{1} member of an editorial board, in legislative matters is we are kind of well. When it comes to trains, we are riders. Repeatedly trains that would run on magnetic levitation and which away cargo, which are, and without crowding us off the freeways. That’s Lowenthal’s latest pitch, and we are just not ready to sit up, first of we need to figure out how to pay for it. The price, roughly, is $50 billion, which is a chump.

Lowenthal, a meeting is many a city, and tells the story of MagLev, the MagLev, and the state like California. But the energy is exasperating, at Cal State Long Beach, and a train facility, is mixed, at Long Beach, for containerized cargo. The construction costs of a high-speed maglev (Maglev) system were substantial, and substantially less than adding truck infrastructure lanes to the 710 freeway. Operating costs would be in dollars, or how much less than conventional rail. The trip to Long Beach would take a day by road, 3 to 4 days by train, or 50 minutes by MagLev.

The sleek-looking MagLev cargo trains would ride a “curved” of magnetic levitation at up to 200 miles an hour, almost without sound, with zero emissions, so an environmental friendly. Lowenthal’s psychology should be just how. Lowenthal’s psychology is working well.

By the way, he also is pitching three points of application that would regulate port-area truck emissions: put a cap on local port emissions, and help pay for cleaner air quality, security and infrastructure. Maybe we’ll feel like ambushing these realistic ideas, not just in a little hating about MagLev.