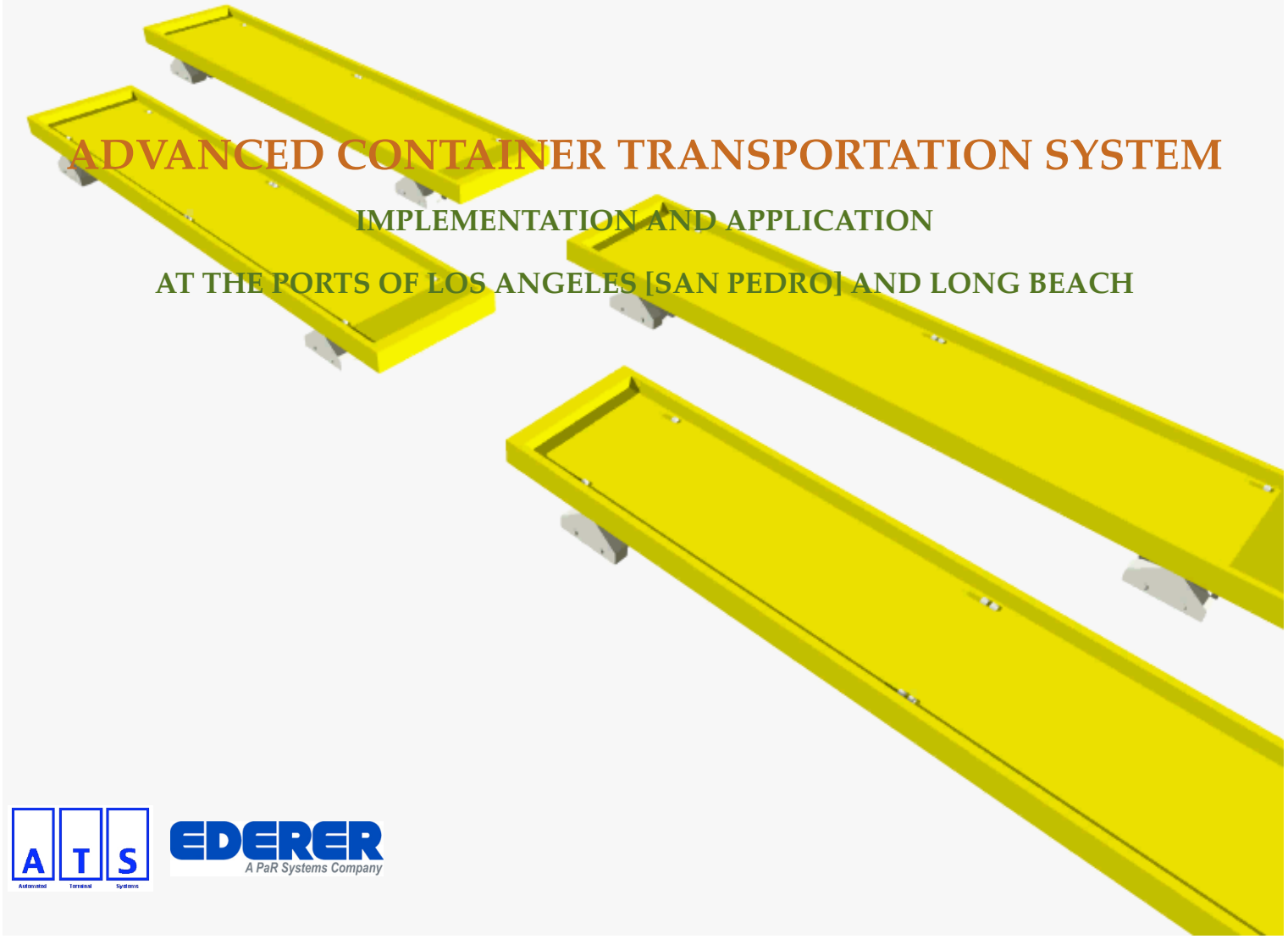
ADVANCED CONTAINER TRANSPORTATION SYSTEM

IMPLEMENTATION AND APPLICATION

AT THE PORTS OF LOS ANGELES [SAN PEDRO] AND LONG BEACH



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Introduction

Background

The Ports of Long Beach and Los Angeles have requested a comparative Technical Evaluation of advanced technologies for moving containers from the ports to the Intermodal Container Transfer Facility [ICTF] and the proposed Southern California International Gateway[SCIG]. The selected consultant will compare and contrast the costs and benefits of the candidate systems with conventional drayage. Conventional trucks may be equipped with clean running engines and use clean burning fuels.

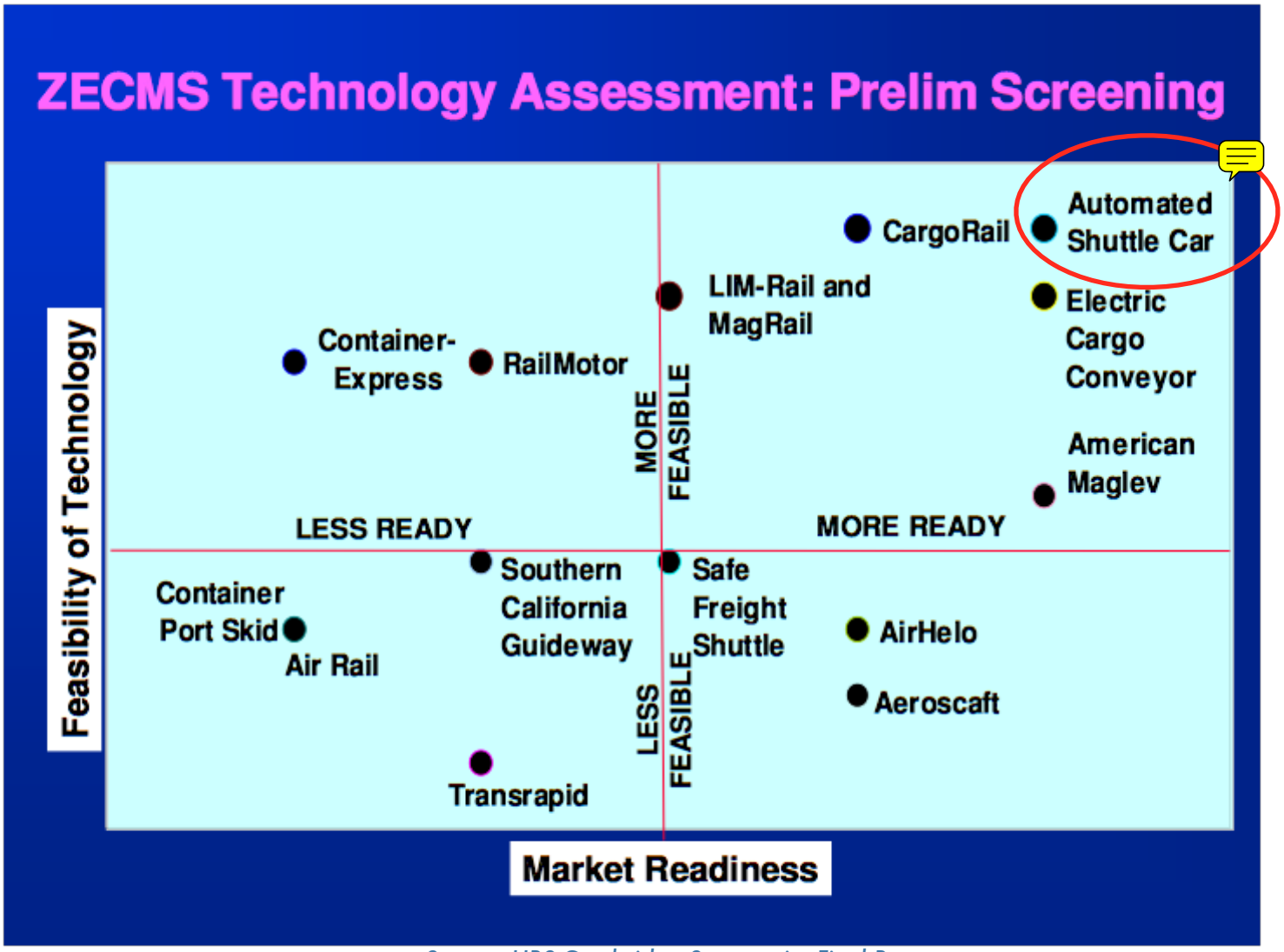
In the Request for Proposals [RFP] the ports have said that they wish to ". . . evaluate innovative ways to improve the overall land access to and from the San Pedro Bay Container Terminals using "unconventional" transportation technologies." The stated goal is to improve the quality of life in the communities around the ports while improving and sustaining operations.

This brief paper introduces an application of proven technologies combined with advanced automation technology that meets all of the goals of the Port Authorities and will assist in that evaluation.

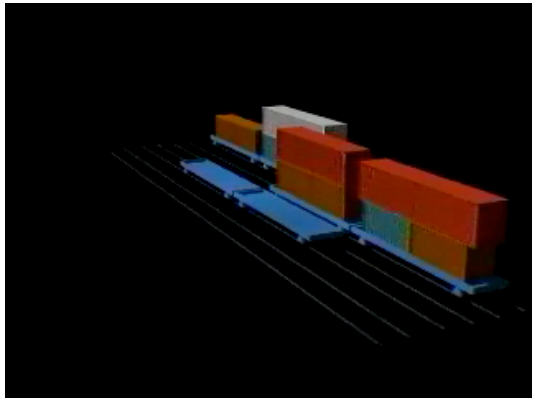
Automated Shuttle Car System

Automated and Semi-Automated Shuttle Cars have long been used in heavy industry. Steel Mills and foundries use them to transport heavy loads between processes and workstations. Usually transport speeds are relatively low. However, the equipment is very robust and typically meets or exceeds the Severe Duty Standard of the Association of Iron + Steel Engineers or Class F of the Crane Manufacturers of America Association. In brief, those standards require continuous operation at or near design loads for a minimum of 25 years. Ederer is an establish supplier of cranes and equipment in the Steel and Heavy Industrial Markets and supplied such equipment for more than 100 years.

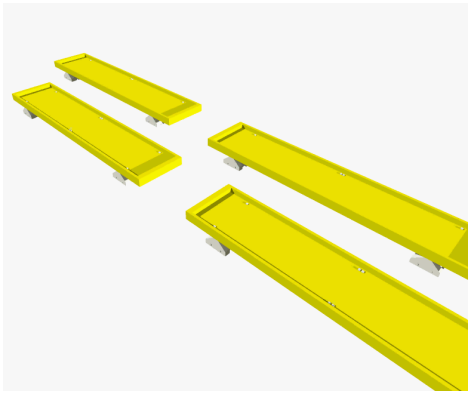
Building on its experience in heavy industry, Container Terminal operations and automation technology, Automated Terminal Systems has developed the first fully automated method for handling containers in Marine Terminals and Intermodal Facilities. An integral part of this method is a system of high-speed shuttle cars capable of moving containers within and between facilities. ATS has designed and proposed a fully automated Shuttle Car System for implementation at Shanghai which will move containers between a Landside Intermodal and Service Facility [LISF] and Marine Terminals located 31 km off-shore on Yangshan Island. We would propose a similar system for the LA/Long Beach Port Complex.



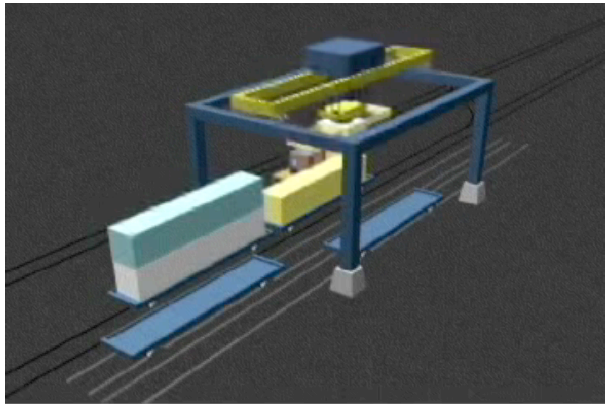
Source: URS Cambridge Systematics Final Report



Shuttle Car Double Stack Configuration.



Shuttle Cars



Automated Load Unload Station

System Description

The ATS Shuttle Car System is comprised of a series of simple, electrically-driven motorized platforms that are individually controlled by a central computer system. Each car has at least two motors at opposite corners for redundancy, and on-board PLC intelligence. Operations within Container Terminals can be single or double-stacked but, for longer transits, single stack mode eliminates the need for Inter-Block Connectors [IBCs] or bulkheads built into the cars. This keeps the equipment net weight low; an important consideration in the overall cost of implementation and operation.

This all-electric system is non-polluting, quiet and highly efficient. Unlike other solutions that may be proposed, the ATS System is not a "train" but dispatches individual cars to meet varying demands from multiple service nodes. The central computer system employs advanced Computational Intelligence to effectively schedule, monitor and control the dispatch of cars. Because the system does not depend upon pre-defined schedules, it can respond quickly to varying demands at the Marine Terminals and the Intermodal Facilities.

System Advantages

The ATS Shuttle Car System employs proven industrial technology with advanced automation and real-time control to deliver a cost effective and environmentally friendly alternative to conventional drayage and unproven complex approaches. Because it uses individually driven, light weight cars, dynamic and static loads are distributed. The light weight and low dynamic loads reduce the seismic structural design requirements . Consequently, the system pathways [Rights-of-Way] are more economical to construct than those which rely on trains and other heavy transport devices. In addition, precise computer control of the individual cars means less variation in transit speeds, further lowering the dynamic loads on bridges and overpasses.

Comparison to Competing Technologies [as currently known]

System	Fabrication Cost	Complexity	Infrastructure Cost	Operating Cost	Flexibility
ATS Shuttle Car	Low	Low	Moderate	Low	High
SkyTech LIM	Moderate	High	High	High	Moderate
TTI Freight Shuttle	Moderate	Moderate	Moderate	Moderate	Low
CCDoTT MagLev	High	High	High	High	Low
MegaRail CargoRail	Moderate	Low	High	Moderate	Low
TransRapide MagLev	High	High	High	High	Low
Aeroscraft Freight Blimp	High	Low	Low	High	Low

We welcome the opportunity to explain the ATS Shuttle Car System in greater detail. Please contact Dan Reiss at 1.202.363.9582 or dan.reiss@atsysusa.com to arrange a presentation.

Shuttle Cars

The Shuttle Cars are simple steel frames similar to the Bombcarts employed in Container Terminals. They are mounted on steel wheels, 2 wheels per axle, 2 axels. Each car is capable of handling 2 20' containers on deck and 1 additonal longer (40 or 45') container on top.

The Shuttle Cars are all electric devices with on-board communications and control. Communication can be via microwave, wireless (IEEE 802.11x) or on the power bus.

Power is delivered to the cars via a contact shoe and a third rail. Within the Container Yard the guide rails and power rail are at grade and below grade respectively.

Rail guage is is any convenient dimension but standard US guage is assumed. Spacing between the maximum dimension of the cars; i.e., the distance between the cars is nominally 2' when operated in the CY but can be as close as 6 inches except in curves where standard railroad spacing considerations are controlling.