CyberTran International Inc. and ULRT

Neil Sinclair, Chairman
Alameda Transportation Commission
Technical Advisory Committee  10/4/2018
Conventional rail transit technology is expensive - many systems are costing over $100 M/mile

<table>
<thead>
<tr>
<th>System</th>
<th>Type</th>
<th>Construction Complete</th>
<th>Gross Cost</th>
<th>Track miles</th>
<th>Capital Cost / Mile</th>
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</thead>
<tbody>
<tr>
<td>EBART</td>
<td>Diesel Multiple Unit</td>
<td>Future</td>
<td>$1.3B</td>
<td>21</td>
<td>$61M</td>
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<tr>
<td>SFO AirTrain</td>
<td>Airport Circulator</td>
<td>2003</td>
<td>$430M</td>
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<td>$71M</td>
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<td>Nanjing Metro</td>
<td>Light Rail</td>
<td>2005</td>
<td>$1B</td>
<td>13.5</td>
<td>$74M</td>
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<td>Low-speed Maglev</td>
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<td>$730M</td>
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</table>
Idaho National Laboratory

- Research indicated high cost of passenger rail and catalyzed system engineering project

- System Engineering Goals
  - Reduced Cost
  - Improved Service
  - Increased Safety
Typical Rail Capital Cost Breakdown

Vehicles, Design, Power etc. 25%
Route Infrastructure 75%
Passenger Rail Is Heavy

- Passenger Rail
- Buses
- Automobiles and Vans

Vehicle Capacity
Vehicle Weight - Tons
Cost of Weight

- Infrastructure Cost
- Infrastructure Weight
- Vehicle Weight

Normalized Vehicle Weight/Cost vs Vehicle Capacity
How Many Vehicles to Carry 120 Passengers?

Automobiles

Focus

Buses

Trains

Vehicle Capacity

Number of Vehicles

0 20 40 60 80 100 120

0 20 40 60 80 100 120 140
Lowest System Cost
Based on analysis, design parameters established

- 6 to 30 Passengers per Vehicle
- Computer Controlled - Low Operating and Capital Costs
- Lightweight - 10,000 Pounds
- Low Cost, Proven Materials and Technologies
- Steel Wheel on Steel Rail - Most Energy Efficient, High-speed Capable
- Electrically Powered – Clean, Efficient, Renewable Energy Sources
Lightweight Guideway

- Easy and quick to install
- No ground clearing
- Smaller foundations

- Components prefabricated offsite
- Can be built off the end of itself
- Grade separated for safety
Off Line Stations

Increased line capacity
Network capable

On-demand service
Direct-to-destination travel
Initial Development at INL – Cost Analyses

- Morrison-Knudsen, 1991, $5.8 M/mile
- Parsons, Brinckerhoff, Quade, and Douglas, 1995, $2.8 M/mile (guideway only)
- Applied Engineering Services, 1995, $5M/mile
- BART all-inclusive cost, 2007, $25 M/mile
Initial Development at INL – Testing

- Prototype vehicle and 2-mile track built and tested at 60 mph
- 2\textsuperscript{nd} prototype vehicle built and tested in curves
- High-speed simulation, American Assn. of Railroads
- Further system design and testing
Technology transferred from US DOE to CyberTran International, Inc.
CTI Development – Analysis

- HNTB seismic analysis
- BART/CNCI investigative study including cost, civil structure design, and operational capability
- Technology program development
Reductions in Energy Consumption & Global Warming

High energy efficiencies

High operational efficiency

90% lower CO₂ than cars

Can be fully solar powered
Other Environmental Benefits

Avoided air pollution

Greatly reduced vehicle scrap

Reduced ecological impacts

Reduced land consumption
Social Benefits

Discourages urban sprawl

Increases social equity

Reduces auto collisions

Improves walking and biking environment
External Economic Benefits

Reduced consumption of oil

Lower traffic congestion

Avoids new automobile infrastructure
CyberTran as Henry Ford
Mass Producing Mass Transit

Computer Automation

Off Line Stations

Many Small Vehicles

Lightweight Structures

Modular Fabrication

High Volume Manufacturing

Lower Cost

Faster Construction

Enables Public/Private Partnership
Final Integration and Test Program (FITP)

- Establish a facility
- Vehicle Development
- Guideway Development
- Control System Development
- Station Development
- Power System Development
- Systems Integration
- System Test
- Business Case for ADTS/ULRT
- Feasibility Studies
- Corporate Development
Product Development Plan

FITP  Low Speed Test & Cert  Low Speed Commercial

High Density Rapid Transit Develop  High Density Rapid Transit Test & Cert  High Density Rapid Transit Commercial

High Speed Develop  High Speed Test & Cert  High Speed Commercial
CyberTran Intellectual Property

- **IP development in:**
  - Vehicle
  - Controls
  - Guideway
  - Stations
  - Power
  - Maintenance and Monitoring

- **US DOE intellectual property purchased by CyberTran International**

- **Currently 8 US patents issued including ULRT system patent**
CyberTran Key Executives

• Neil Sinclair, Chairman
  – Advanced transportation systems business executive since 1990.

• Dexter Vizinau, President
  – Government Relations Specialist, 22 years at IBM

• Harry Burt, Board Secretary
  – Rail vehicle and system engineering management since 1969
Consultants and Partners

Development Team

- Deterministic Systems Inc
- StanTec
- Todd Jersey Architecture
- Interfleet
- Schweitzer Engineering Labs
- BayPac
- University of California, Berkeley
- Lawrence Berkeley Laboratory
- Lawrence Livermore/Sandia Natl. Lab

- Control
- A and E
- Architecture
- Rail Systems
- Power Systems
- Civil Engineering
- Advanced Control
- Power Systems
- Safety, Vehicle
Dublin to Livermore cont.
Dublin to Livermore cont.
Valley Mobility Link – LLNL to Tracy