Low Cost, High Value Maglev

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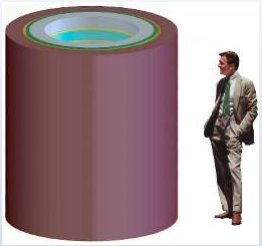
LaunchPoint Technologies, Inc.

- Maglev Heart Pumps
  - 1st Human Implants
  - 1st Infant Pump
- Maglev Energy Storage
- Maglev Space Launch

WorldHeart Rotary VAD

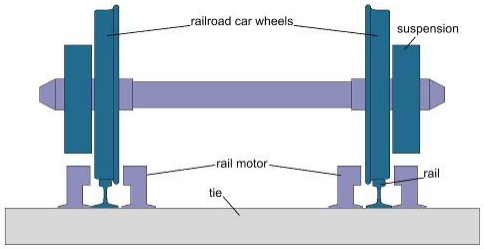
Pedia VAD

Power Ring Electricity Storage



Launch Ring Space Launch

Rail Motor Railway Electrification



- Converts *existing locomotives* to electric operation in selected zones
- Eliminates *all air pollution from trains* in those zones
- Improves energy efficiency
- Improves system throughput
  - Higher speed on inclines
  - Replaces pusher locomotives
  - Regenerative braking on declines

LAUNCHPOINT TECHNOLOGIES

What is the Best Investment for New Southland Transit Infrastructure?

- Population growth outpacing rest of State and US growth
- Passenger travel and freight already straining capacity, raising costs and hurting QOL
- Transit investment must maximize social benefits – increase ridership, reduce congestion, energy usage, pollution (diesel particulates)

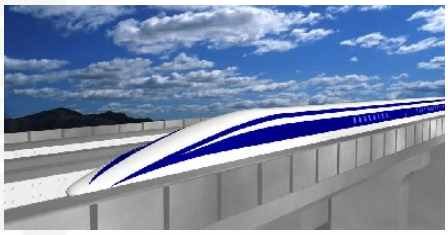
LAUNCHPOINT TECHNOLOGIES

Barriers to Improved Transit Service

- High right-of-way, construction costs for new transit routes
- High operating, energy, environmental costs at current ridership levels
- Technology limits – fixed schedules, transfer delays, slow door-to-door travel time

LAUNCHPOINT TECHNOLOGIES

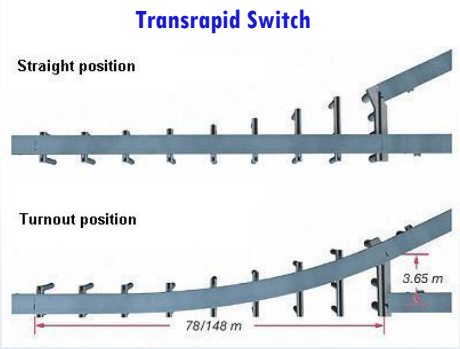
Why hasn't MAGLEV solved the problem?



- Extensively researched for 30+ years
- Tremendous potential benefits
  - several levitation and propulsion designs
- BUT….operational limitations and high costs have prevented acceptance

LAUNCHPOINT TECHNOLOGIES

Limitations of Conventional Maglev



- Slow, expensive mechanical guideway switching
- In-line stations, no dynamic routing
- Long headways

Result: Competing Transit Modes

Conventional Maglev:

- Faster (slightly)
- Most energy-efficient
- Quiet at urban speeds
- Very high ROW costs
- Lack of flexibility limits urban usage
- Need to switch modes increases travel time

HSR:

- Fast (with costly ROW improvements)
- Only for long distances

Urban Rail:

- Limited capacity
- Fixed schedules
- Noisy
- High O&M costs

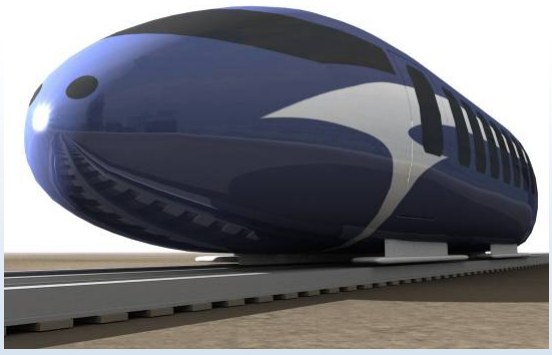
Solution: Maglev on Rail

- A New "Standard Gauge" for All Rail Transit
- Fully Inter-Operable: "Backwards Compatible"
- Subway Retrofit/New Intra-City Transport
- High-Speed Inter-City Transport
- Freight Transport – Trucks and Cars Possible

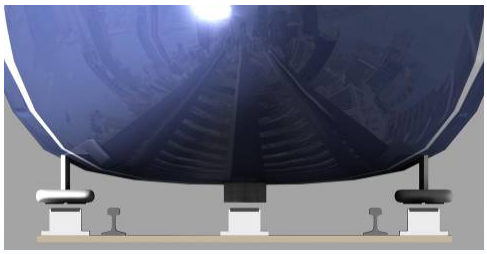
A Simpler, Better Maglev Design

SPM: Stabilized Permanent Magnet Suspension Using Opposed Halbach Arrays

- Permanent levitation
- Electronic stabilization
- Few mechanical parts
- Low drag at all speeds
- Low power
- Instant track switching



Incremental Upgrade



- Inter-Operable
  - Simultaneous rail/maglev operation possible
- Builds on Existing Infrastructure
  - Zero ROW costs for retrofit
  - Can use existing stations, etc.
- Reduces Risk
  - Incremental network upgrade
- PLUS….all the advantages of maglev

A Unique Set of Advantages

- Flexible Infrastructure
  - Mass Transit, Group Rapid Transit, Personal Rapid Transit
  - Combined Inter-City and Urban Transit
  - Installations on rail or roads (highway medians)
- Dynamic Routing
  - Optimize ridership, cut travel time, customize itineraries
- High Performance
  - Fast & Quiet with low energy usage
  - Maximizes value of transit-oriented development

Key Component Cost Comparison

Cost per mile of dual guideway, tracks, motor and electrical:

Conventional Maglev	SPM Maglev Retrofit	New SPM Maglev
~$45-60M	~$20M	~$25M

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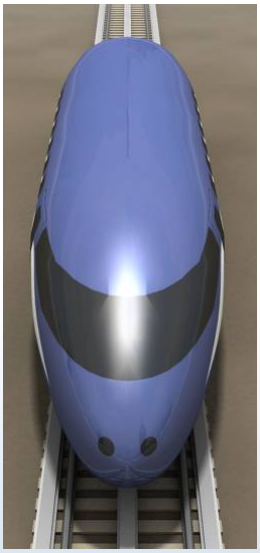
Value vs. Investment

- **Incremental HSR***
  - Upgrade existing railways (~90-150 mph)
  - Value/Initial Investment = 1
- **New HSR***
  - New alignments and track (175-200 mph)
  - Retain access to city centers
  - Value/Initial Investment = 0.3
- **Conventional Maglev***
  - Entirely new guideways (200+ mph)
  - 4-9x the cost of IHSR
  - Value/Initial Investment = 0.3
- **SPM Maglev**
  - Upgrade existing railways (200+ mph)
  - Value/Initial Investment >1



*Report to Congress: Costs and Benefits of Magnetic Levitation U. S. DOT, FRA, 11/2005

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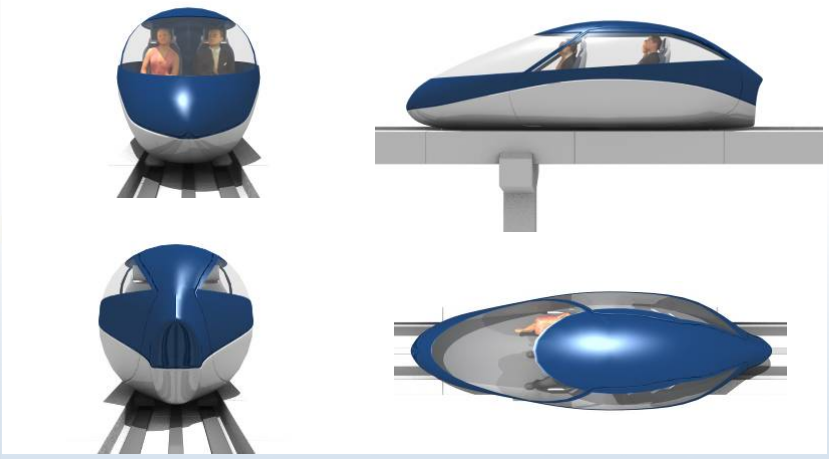
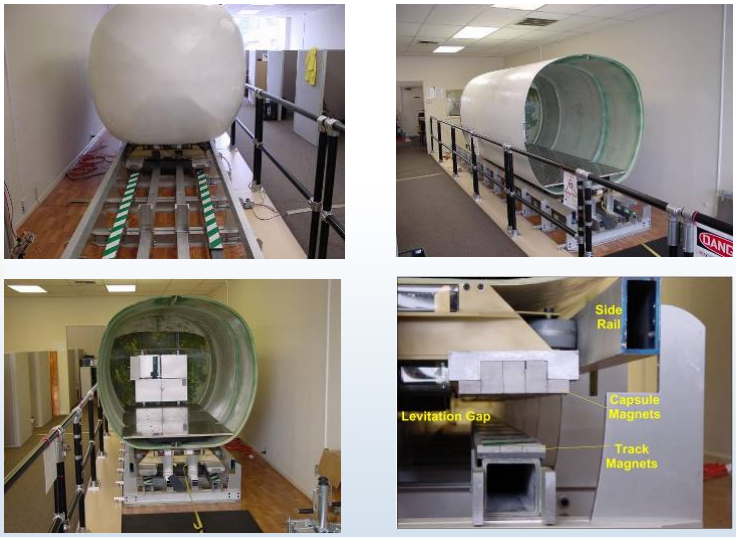
Design Also Supports Maglev PRT



LaunchPoint Prototype



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Project Status

- Fastransit funding construction and test of demo system
- Recruiting development partners and hiring staff
- Beginning outreach to key customers and constituents

Seizing the Opportunity

- Build a Low Cost Demonstration System
  - Existing rail lines
  - Existing stations
  - Maglev Performance & Advantages
- Prove the Concept to Stakeholders
- Grow the System Incrementally
- Create a Revolutionary New Form of Transit that fully Utilizes Existing Infrastructure

Thank-you

Questions?