MegaRail® Alternate to Light Rail

Practical & affordable solutions are now available!

- Low Cost
- Low Tech
- Low Risk

MegaRail® Transportation Systems, Inc.
Fort Worth, Texas

U.S. PATS. 6,039,135, 6,401,625, 6,435,100, 6,615,740, 6,742,458, 6,834,595 & 6,837,167
OTHER U.S. & INTERNATIONAL PATENTS PENDING
LRT has Serious Guideway Problems

Not light weight – Must support 149,000-lb cars

- Heavy-duty bridge structures needed

Guideway – Railroad-type grade, ballast, rails & cross-ties

Right of way – Dedicated ROW needed – 44-ft for dual track

- 25-ft on city streets (Typical) Plus side trolley wire posts
- On-street lines often take two traffic lanes
LRT has Major Station Problems

**Typical characteristics**

- **200-ft platforms** (Handle 2-car, 200-ft trains)
- **Open platforms** (No passenger protection from trains & guideway)
- Need additional right of way

**Elevated stations** – Often large and expensive

**Street stations** – Take away two to three traffic lanes

- Large & costly structures
- Open Passenger Platforms
- Stations can block traffic lanes
LRT has Critical Cost & Time Problems

High initial cost – $30 to $60 M / mile – Avg. $45 M / mile
(US) Now typically 50% Federal – 50% local funds

High O&M costs – 15 - 25% from fare box - Balance from taxes

Large & costly maintenance facility

Long wait time – Often 6 to 12 years
- Years of lobbying congress (US) – Often greatest time hurdle
- Long ROW acquisition process
  - Long construction time
  - Major traffic disruptions
LRT has Installation & Traffic Impacts
Major light rail system problems

Street light rail – Serious traffic disruption
- Streets torn up for months
  - Traffic rerouted
  - Business failures during construction – Street blockage impact
- Long-term traffic disruption – Traffic flow impeded by trains
- Frequent grade crossing accidents – cars & pedestrians

Dedicated right right-of-way
- Tearing down homes and businesses
- Extensive grading & utility relocations
- Environment damage – Noise, visual & drainage impacts
Light Rail has "Last Mile" Problem

Service does not appeal to most people

Root cause of low ridership problem
(System unable to provide door to door & 24/7 service)

Light rail stations
(one to two mile spacing)

Typical max walk distance
(1/8 mile)

Desired service area
(Now served by buses or nothing)

Only carless people and limited others ride system
MicroRail Offers
Affordable, Low-risk & NOW
Alternate to LRT

Better mass transport in less time and at less cost!

- Low Cost
- Low Tech
- Low Risk
Superior MicroRail SkyCoach™ Performance

Performance

• High-speed – 65-mph – Short trip times!
• High passenger capacity
  • 26,000 pphpd (Typical light rail 200-ft station length) (36,047 with 300-ft stations)
    ( Typical max at-grade light rail capacity = 5,220 pphpd )
• Short wait times – As short as 30 seconds
  ( Typical time for conventional, at-grade light rail is 6-min )

Grade-separated – Small, factory-built stainless-steel guideways

• No crossing accidents or street traffic delays
• No pedestrian accidents

Go-anywhere ( Including up hills ) – Cars use rubber tires

Plus – Offers “Last Mile” problem solutions!
MicroRail Transport is Available NOW!

Guideway installation
- Guideway engineering – Immediate start
- First production guideway sections deliver in 12 months

Train production
- Start within 12 months
- Deliveries within 18 months

First service within 30 months – (Manual control)

No waiting for extensive new development!
MicroRail™ SkyCoach™ Urban Transport

Superior performance to light rail & monorail in small space & at low cost

Ultralight MicroRail SkyCoach urban transport train on elevated guideway
(Mechanically-coupled train operated by on-board motorman)
Conventional off-the-shelf Train Control

*MicroRail*

Used on light rail systems for over a century

- Manual speed and brake controls
- Precise in-cab signaling for close train spacing
## Signaling & Train Control Systems

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<th><strong>Signaling system</strong></th>
<th>Position &amp; speed read by each train</th>
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<td>Required braking zones – Amber bars &amp; max speed</td>
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<td>Prohibited entry zones – Displayed as red bars</td>
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<th><strong>Train operator controls</strong></th>
<th>Simple &amp; easy-to-use</th>
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<td>Throttle – Brakes – Left/right Switch Select – Doors</td>
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**Integrated part of system – Not a separate system**
Attractive & **Low Profile** Stainless Guideway

**Ultralight, stainless-steel structure**

Guideways elevated above street & pedestrian traffic - *MicroRail* guideway photo

**Minimum sky blockage – No wide elevated LRT shadows**

View looking upward through guideway

Small, 6.4-ft wide by 34-inch high *MicroRail* guideway

U.S. Patent 6,837,167
Small, **low cost**, factory-built guideway

Fast, bolt in place installation

6.4-ft wide by 34-inch high **MicroRail** guideway

Guideway cross-section

**System cost** – 20% of typical LRT system cost

- Over street rights-of-way – No more land or earth moving projects
- Mass-produced, factory-built sections – fast on-site assembly
Factory-built, Modular *SkyCoach*™ Stations

- *MicroRail*™ mass transit train at four-car elevated, over-street *SkyCoach*™ station

- Low-maintenance stainless-steel
- Low cost
- Minimum street impact

Platform-edge wall with sliding doors omitted to show train

Stations over streets

Stairs

Elevator

Wall with sliding doors for safety
**MicroRail SkyCoach™ Train Design**

Trains of small & light-weight, mechanically-coupled cars

- 8-ft long cars
- 2-ft car spacing
- 20 to 30-car trains – Up to 260 to 390 passengers per train
SkyCoach™ Step in and Sit Entry & Exit

- No center aisles!
  - Fast entry & exit
  - Short station dwell times
- Ample leg room

Photos are of larger, but similar, MegaRail cabin

All cars are wheelchair-compatible
**SkyCoach™ Offers Safe Escape**

Unaided escape for all (including wheelchairs) without rescue personnel

- Full-height escape doors in ends of cars
- Open-mesh escape walkway between rails
- Covered electric rails

*Upward view through walkway*
Low Energy Use

- **Electric power to trains**
  - 3 phase, 240V, 50 or 60 Hz
  - Four power rails – Located inside rail tubes

- **Power to system**
  - 3 phase, 13,000V, 50 or 60 Hz – Substations at each 4 miles
  - Distributed internally by system cables inside rail tubes
  - Step-down transformers on guideway support columns

- **Emergency power** – Generators spaced along guideway

- **Energy use** – For 10-car train - Stations at 0.5-mi.
  - Peak energy (during acceleration) – 0.68 Mw *
  - Average energy use per hour – 138 kw - (20% of LRT power)

* Loads would be balanced by time-matching accelerating & decelerating trains to reduce total system peak power to approach 160-kw x number of trains.
Low-cost, All-weather, Enclosed Rails

- **Low-cost guideway rails**
  - Formed from flat stainless-steel
  - Machine-welded construction
  - Low material & labor costs
  - Bolt-in electric power rails
  - Trucked to installation site

- **All-weather, enclosed rails**
  - Wheels & power collectors inside
  - Protected electric power rails
  - Dry & ice-free traction surfaces
  - Safe operation in any weather
Technical Summary

Unique new combination of off-the-shelf, proven technology

Enclosed stainless-steel guideway rails - US Pat. 6,039,135

- Simple welded steel factory fabrication
- Standard electrical power rails

Flat-free tires – Current car tire technology

Permanent-magnet electric motors

- Current commercial brushless-motor technology
- Electric motor wheels – current electric car use

Car-based steering & switching

- Automobile-type steering with electronic control
- Switching – No moving rails – Used in other people-movers

Only the combination & guideway are new!
SkyCoach Maintenance

- **Daily** – Cleaning & equipment inspections
  - Accomplished at stations during nightly shutdown times
- **Routine Periodic** – Actuators, tires, brakes, electronics
  - Accomplished at on line service station on storage rail
- **Car Installation & Removal**
  - Accomplished at on line service station on storage rail
  - Lifts move cars between guideway and trucks on street
- **Major Maintenance** – HVAC service, interiors, doors
  - Accomplished at ground level service center
  - Service center similar to an automobile repair facility

No costly guideway to a costly repair center!
MicroRail™ – “Last Mile” Problem Solutions
Driver-controlled, hybrid-electric Skytram™ service

Available - 36 months

Dualmode, 52-passenger, 25-mph SkyTram™ service areas beyond easy walking range
Future dualmode electric & hybrid-electric automobiles

Available - 48 months

Automated personal dualmode automobile service on guideways
Dualmode personal automobile service on ordinary streets
Factory-built, Modular *SkyTram™* Stations

Dualmode *MicroRail™ SkyTram™* at station on parking lot

- Low-maintenance stainless-steel
- Low cost
- Minimum ground space
Future Growth Summary

**Improved service – More frequent & personal service**
- On-demand, 24-hour, seven-day service
- Personal automated transport (PAT) service
- Short wait time for group automated transport (GAT) service

**Time to initial automated service – 42 months!**
- Only 12 months after start of manual-control train service

**Added future features – Improve “Last Mile” solution**
- Personal automobile service – Electric dualmode car capability
- Automated cargo container car service

*MicroRail – Available NOW + Exciting Future Growth Options*
MicroRail - Low-risk Solution

Revolutionary, but entirely upon off-the-shelf, proven technology

- First systems use manual train control
  Control proven in transit and railroad systems

- No exotic new technology
  All technology proven in transit and auto systems*

- Guideway is only really new element!
  (And it is a simple welded steel structure)

* Future automated systems also employ proven aircraft technology
**MicroRail Transport Summary**

**Performance** – Beats LRT – and solves “Last Mile” problem

- 26,000 pphpd (200-ft LRT-size stations) – Up to 36,947 pphpd with 300-ft stations
  
  At-grade LRT capacity = 5,220 pphpd

- Shorter trip times  • Bus-type hill capability  • Dualmode serves more

**Early service** – Within 30 months! – (LRT-type manual control)

- Much less than typical LRT systems - No funding delays

**Total system cost** – 20% to 22% of typical LRT system cost

- Local funding and control  • No on-going operation subsidies

**Environment friendly** – Noise free operation

- No construction or operating impacts to business or street traffic
- No earth moving  • No added right-of-way  • Zero emissions

**MicroRail** – Available NOW

*Low Cost  • Low Tech  • Low Risk*
Revolutionary, High-speed, Multi-user 21st Century Transport! offers -

• Unprecedented level of service
• Low transportation user costs

Near-term & affordable solution to traffic & air pollution problems