

MicroRail monorail, LRT, BRT & streetcar alternate



Practical & affordable alternate is 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

© Reg. U.S. Pat. & Tm. Off.

Presentation Covers

Major problems with current transit systems

MicroRail™ system – The **affordable** alternate

MicroRail™ capabilities & advantages

Monorail Guideway Problems

Heavy piers & beams – Must support 100,000-lb cars

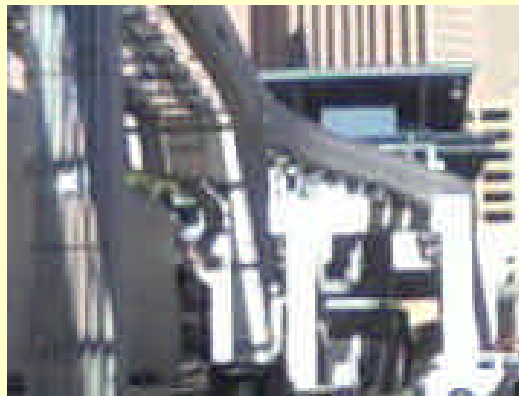
- Massive concrete piers to support monorail beams

Guideway – Necessary escape walkways now block sky

Right of way – ROW for piers & trains needed

- 25-ft over city streets (Typical) – Support piers - Typ. 6-ft x 4-ft

Not your father's Disney monorail



Heavy & costly structures



Massive support columns



Large amount of sky blockage

LRT/BRT & Streetcar Guideway Problems

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

- Heavy-duty bridge structures needed

Guideway – Railroad-type rails or dedicated BRT pavement lanes

Right of way – Dedicated 44-ft ROW needed can be needed

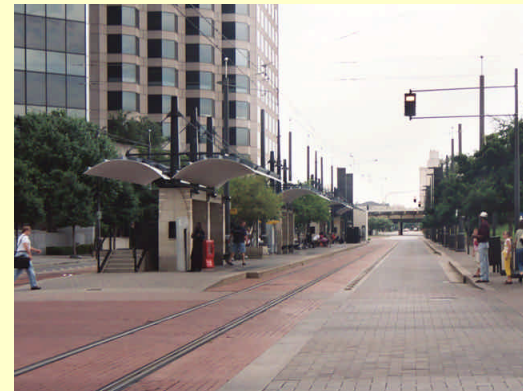
- 25-ft on city streets (Typical) Plus side trolley wire posts for LRT
- On-street lines **often take two traffic lanes & interfere with traffic**



Heavy-duty & costly structures



Massive support columns



Multiple traffic lanes lost

Critical Cost & Time Impacts

LRT, Streetcar, BRT & monorail systems

High initial cost – \$30 to \$190 M / mile (US)

At-grade LRT - \$30 – \$60M/mi – (Avg. \$45M/mi)

(Slightly lower cost for BRT)

Las Vegas Monorail - 3.9-mi (\$650M) (\$166M/mi)

Next 2.4-mi est. \$454M (\$189M/mi)

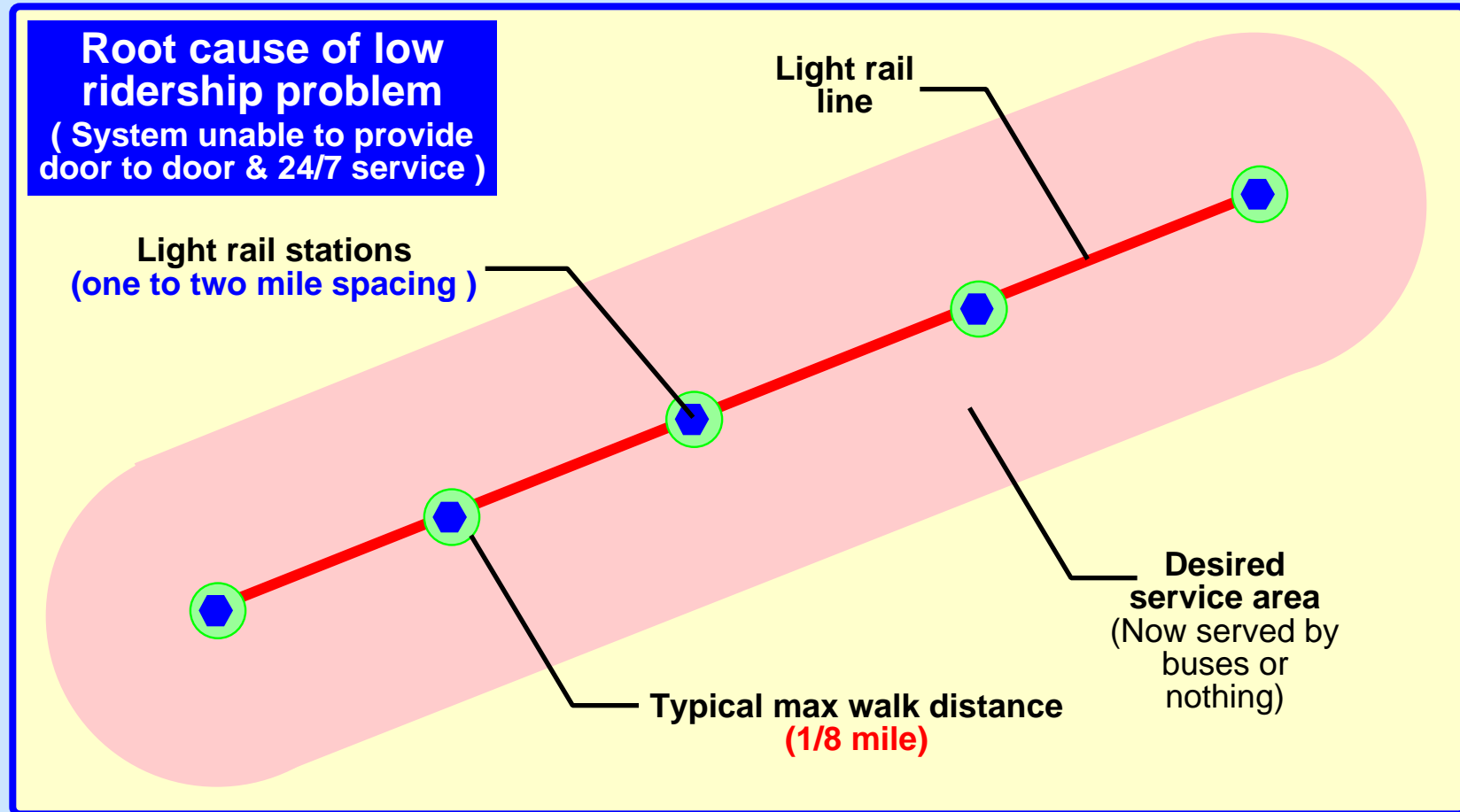
High O&M costs – 15 - 25% from fares - Positive ROI impossible

Long wait time – Often 6 to 12 years

- Heavy construction required
- Major traffic disruptions

Fixed Route Transit “Last Mile” Problem

Service does not appeal to most people



Only the carless & a few others use fixed route transit

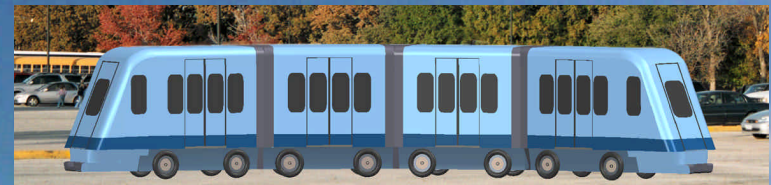
To date, expensive BRT has offered the only solution

Monorail, LRT, Streetcar & BRT Alternate

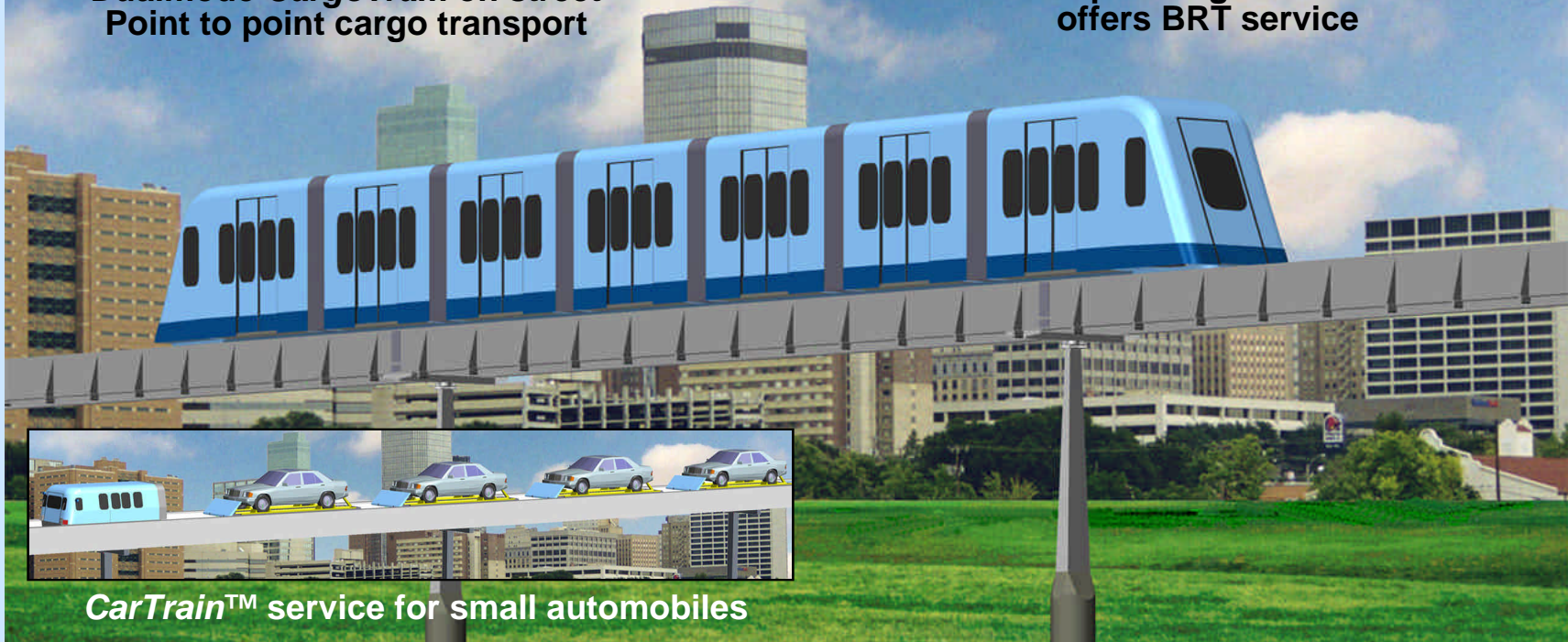
Superior performance & capability in **small space** & at **low cost**



Dualmode *CargoTram* on street
Point to point cargo transport



Dualmode passenger tram on street
offers BRT service



CarTrain[™] service for small automobiles

Ultralight *MicroRail* passenger transport train on elevated guideway
(Mechanically-coupled train operated by on-board motorman)

PAT. PENDING

Expanded *MicroRail* Capability

All LRT, streetcar, BRT & monorail capabilities plus

- Guideway stations – Serve both guideway trains & dualmode trams
- BRT capability **plus** •• Guideway station use & short turns (30-ft)
 - Electrical guideway operation
 - Hybrid street operation

Point to point cargo transport – Cargo trams

- **Shares passenger train guideway**
- On or off-guideway transport
- Electrical guideway operation
- Hybrid street operation

Easy expansion – Affordable extension throughout area

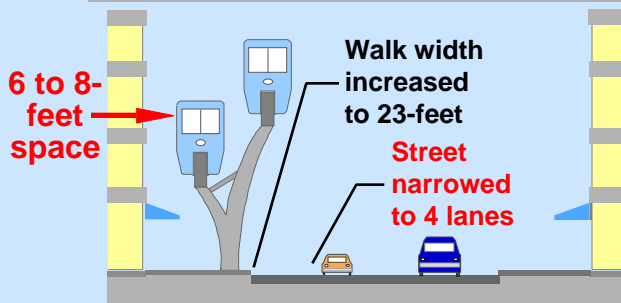
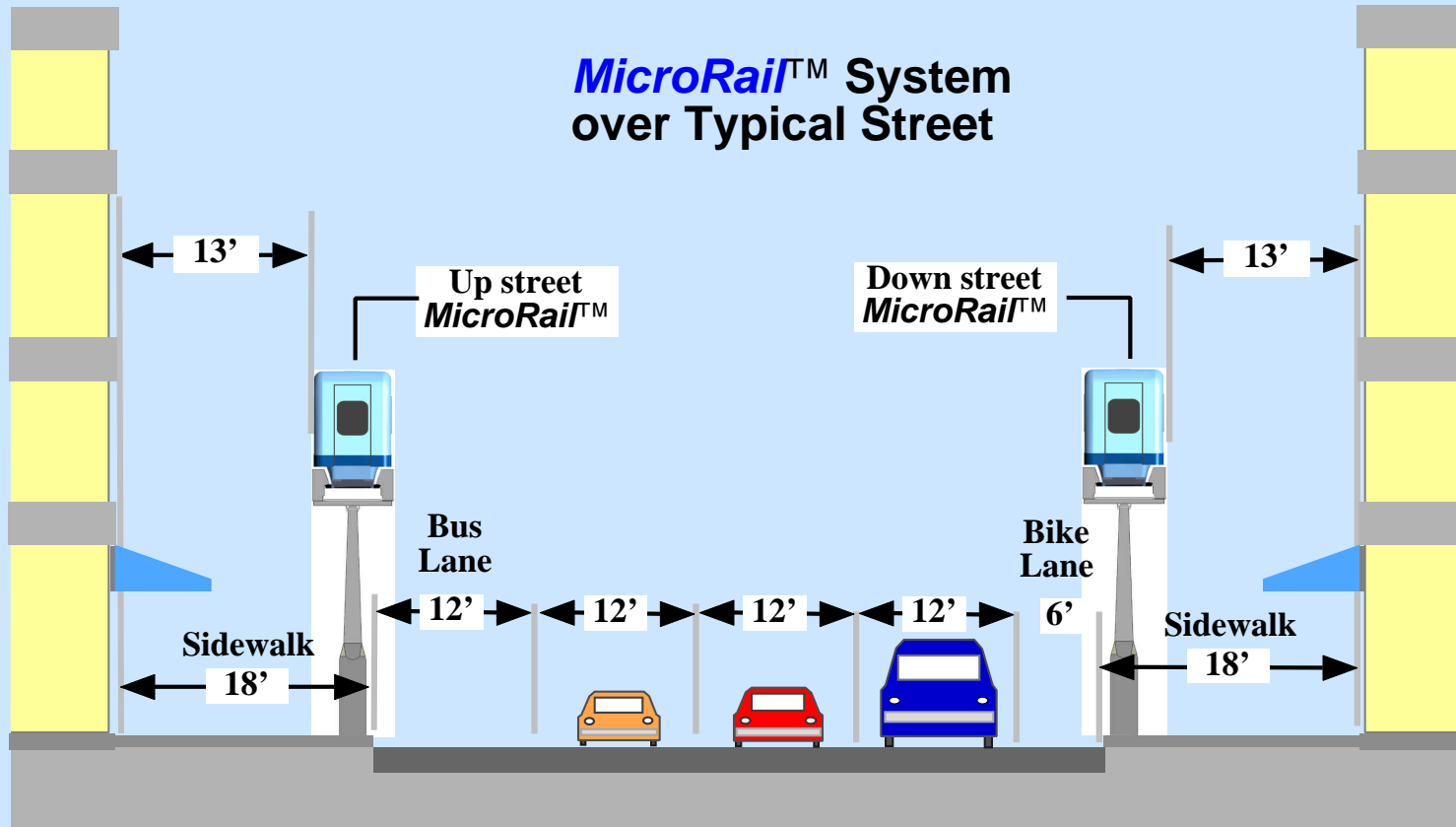
- Use available bridges or new, lightweight suspension bridges
- No traffic lanes eliminated
- Minimal installation impact

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

PAT. PENDING

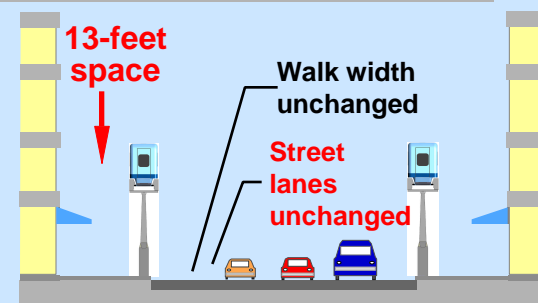
MicroRail™ Easy Fit over City Streets

MicroRail™ System over Typical Street



Heavy Monorail Recently Proposed for Seattle on Same Street

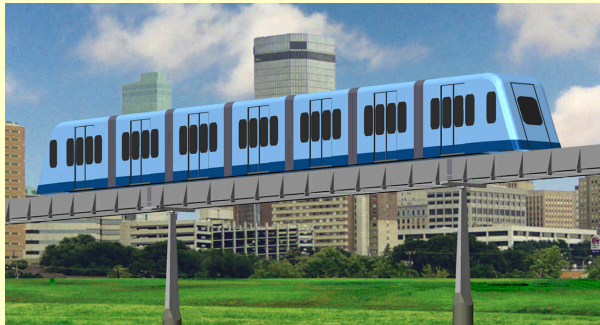
Note street lanes loss & trains within 6-feet of buildings.



MicroRail™ Skycoach™ mass transit service

MicroRail – Affordable urban mass transit

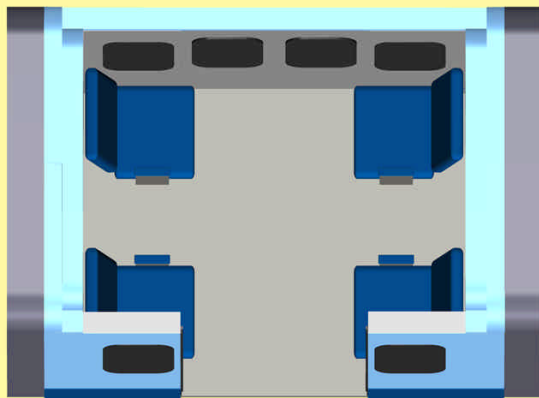
- Whisper-quiet smooth ride
- **ALL passengers seated**
- Grade-separated for safety
- Safe, derail-proof design
- **All-weather** service
- 65-mph top speed



65-mph ultralight MicroRail mass transit train

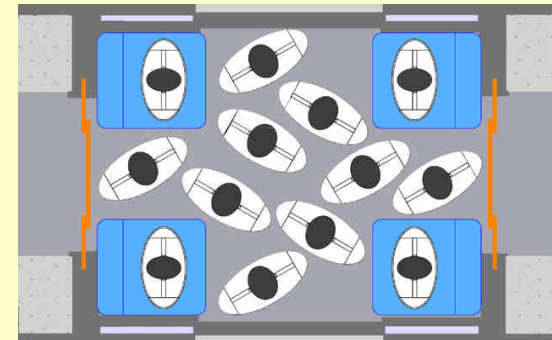
- Service in **36 months**
- All-electric operation
- Use **street** right-of-way
- Ultra-low noise
- Motorman **manual** control
- Ultra-low **20% LRT** cost
- **6X at-grade LRT** capacity

MicroRail – Small, Ultra-light, comfortable SkyCoaches



MicroRail SkyCoach Interior

- **3% LRT** car weight
- Self-propelled
- Long-life stainless
- **Rubber** tires
- **Air** suspension
- Air conditioned
- 13-passenger cars



MicroRail coaches carry up to 13 and seat from four to six passengers

20 to 30-car trains – 260 to 390 passengers per train

Superior *MicroRail* Performance

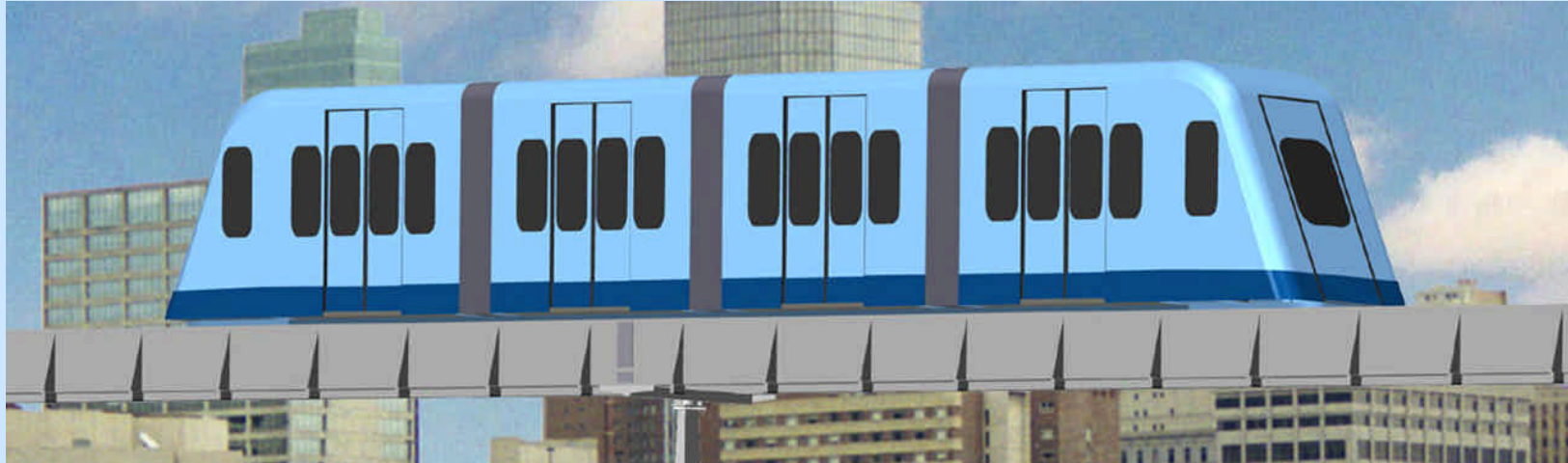
Passenger performance

- High-speed – **65-mph** – Short trip times!
- **High** passenger capacity
 - **24,000 pphpd** (Typical light rail **200-ft** station length) (36,000 with 300-ft stations)
(Typical conventional monorail capacity = **7,520 pphpd**)
- Short wait times – As short as **30 seconds**
No switching delays – **Full-speed, car-based switching**

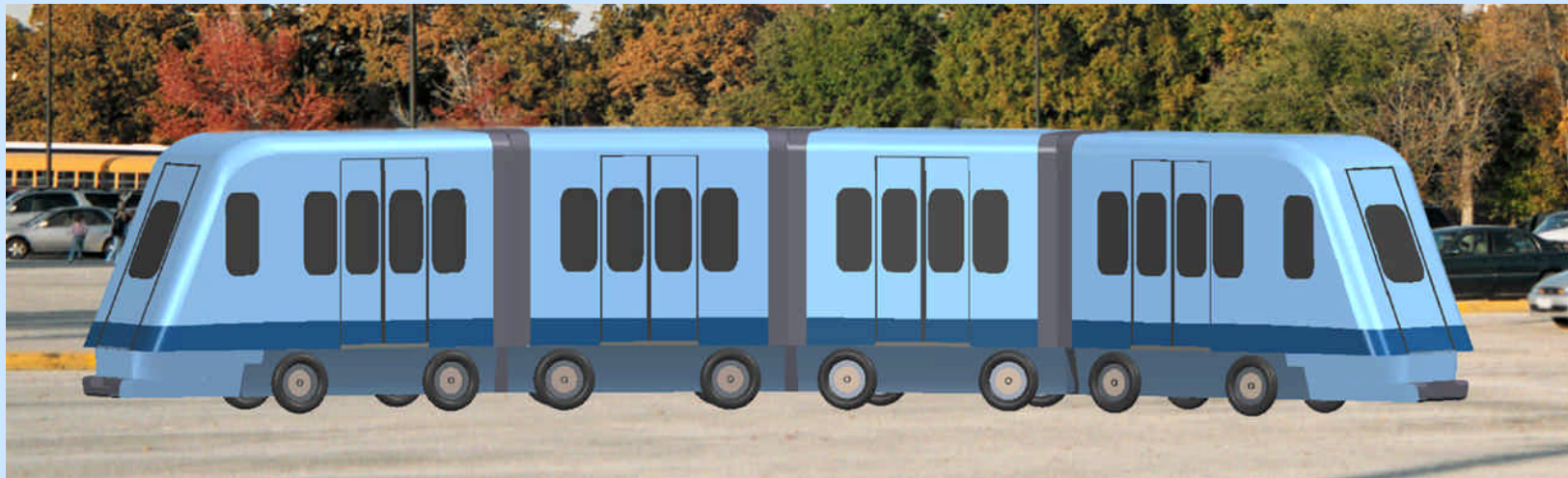
Cargo & automobile transport performance

- High-speed – **65-mph** – Short trip times!
- **No automobile or cargo traffic delays**
- Fast car travel & cargo delivery to local docks & terminals

MicroRail Dualmode SkyTram™ BRT Service



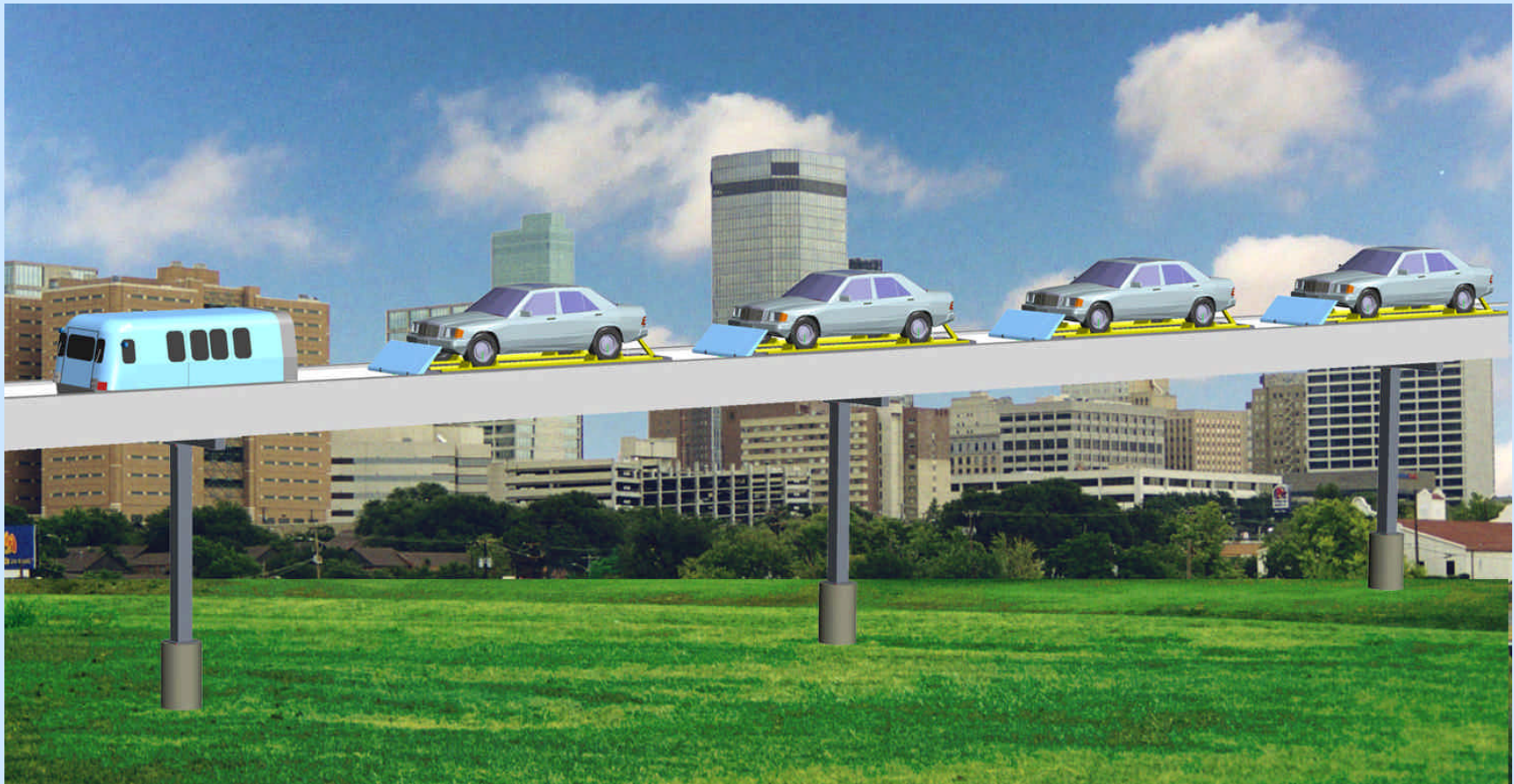
Dualmode passenger **SkyTram** operates on guideway under automated control with guideway electrical power



Dualmode passenger **SkyTram** provides **BRT service** on street in hybrid mode

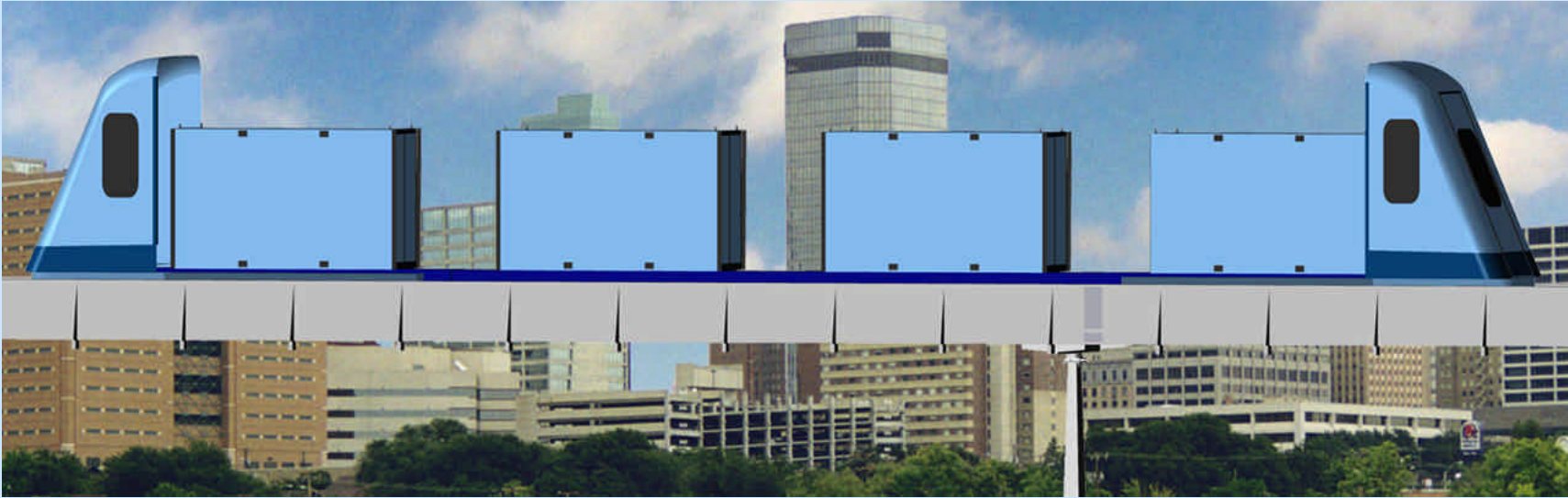
PAT. PENDING

MicroRail[™] Dualmode **CarTram**[™] **Near-term** Freeway Congestion Relief



- Cars drive on and off to side roads at stops at the same time
- Compact cars with passengers move at constant 65-mph speed

MicroRail™ – Dualmode Cargo Tram!



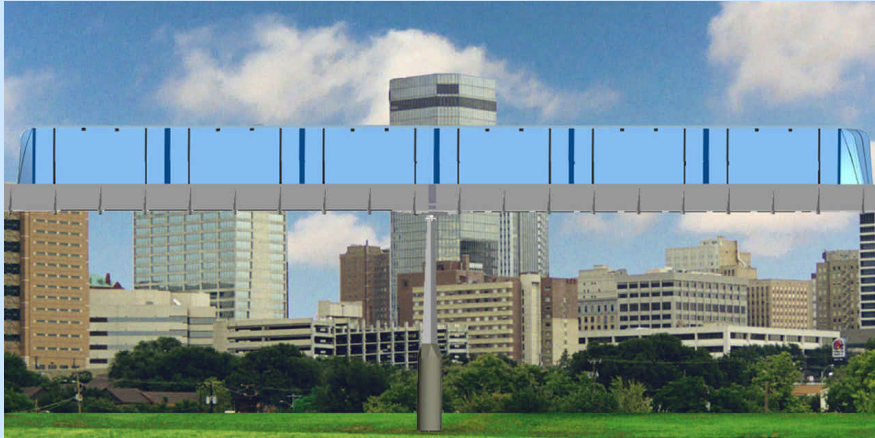
Dualmode cargo tram operates on guideway under automated control with guideway electrical power



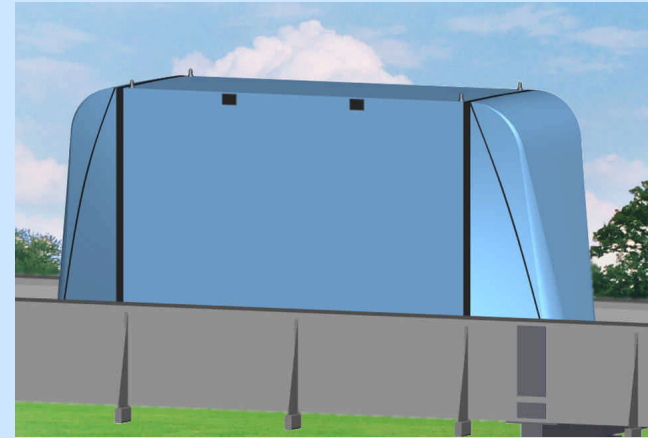
Dualmode cargo tram exits guideway & operates on street in hybrid mode PAT. PENDING

Guideway shared with passenger trains & trams

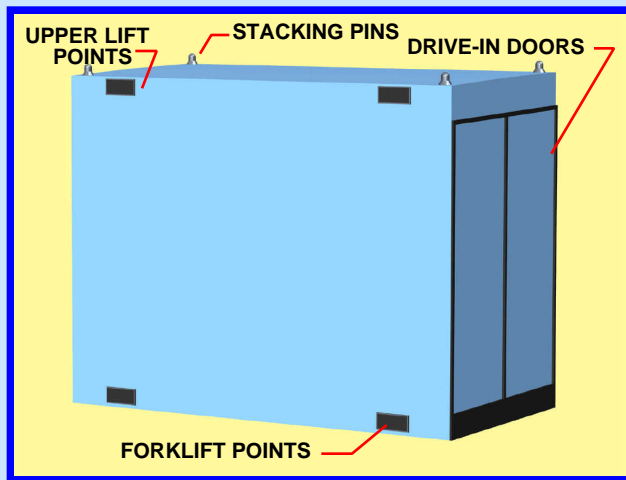
MicroRail™ – Point Point Cargo Transport!



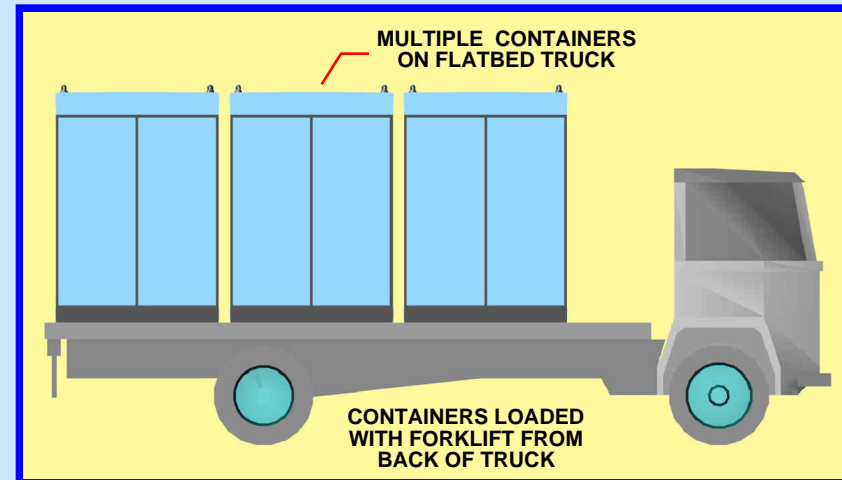
Cargo Container Train Transport
(In trains to on-guideway cargo & tram terminals)



Future Automated Container Transport
(Single carriers to on-guideway terminals)



One & One-half Tons / Container



Containers are Transportable by Truck

Comprehensive Urban Cargo Transport

PAT. PENDING

Attractive, **Low Profile** Stainless Guideway



Ultralight, stainless-steel structure

Long-life, no rusting

Guideways elevated above street & pedestrian traffic - *MicroRail* guideway photo
Minimum sky blockage – No wide beam, switch or LRT shadows



View looking upward through guideway

U.S. Patent 6,837,167

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

MicroRail 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 36 months – (Manual control)

No waiting for extensive new development!

Demo system operating

Prototype Test Vehicle

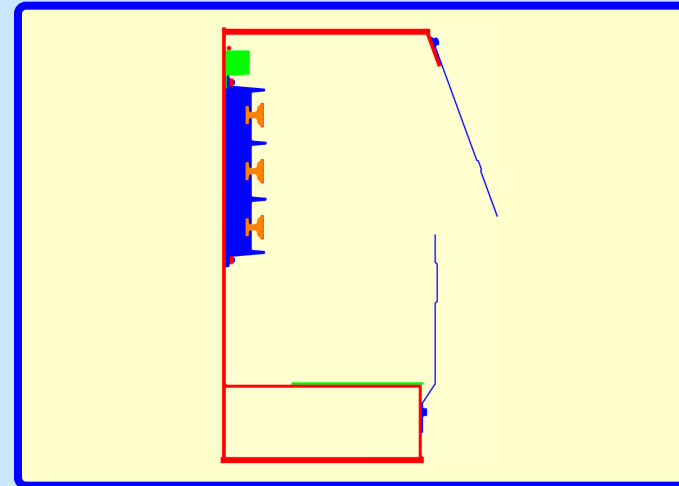
Now in road and guideway testing



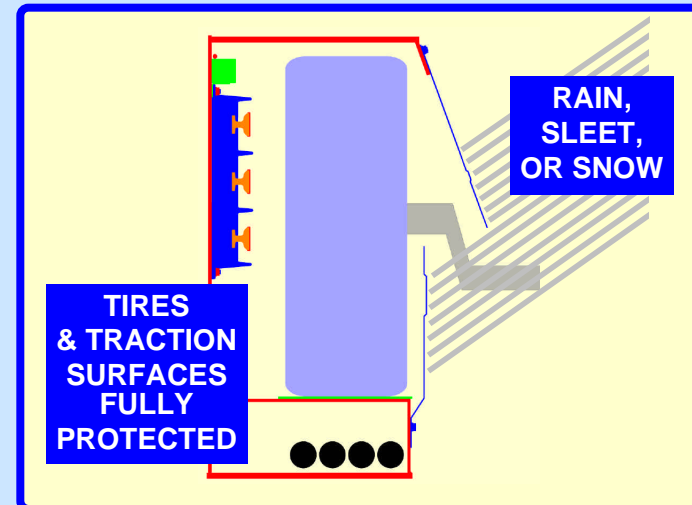
**Main chassis unit of hybrid dualmode tram lead car in test
(Dualmode version operates both on guideway & streets)**

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**
 - **Whisper-quiet operation**

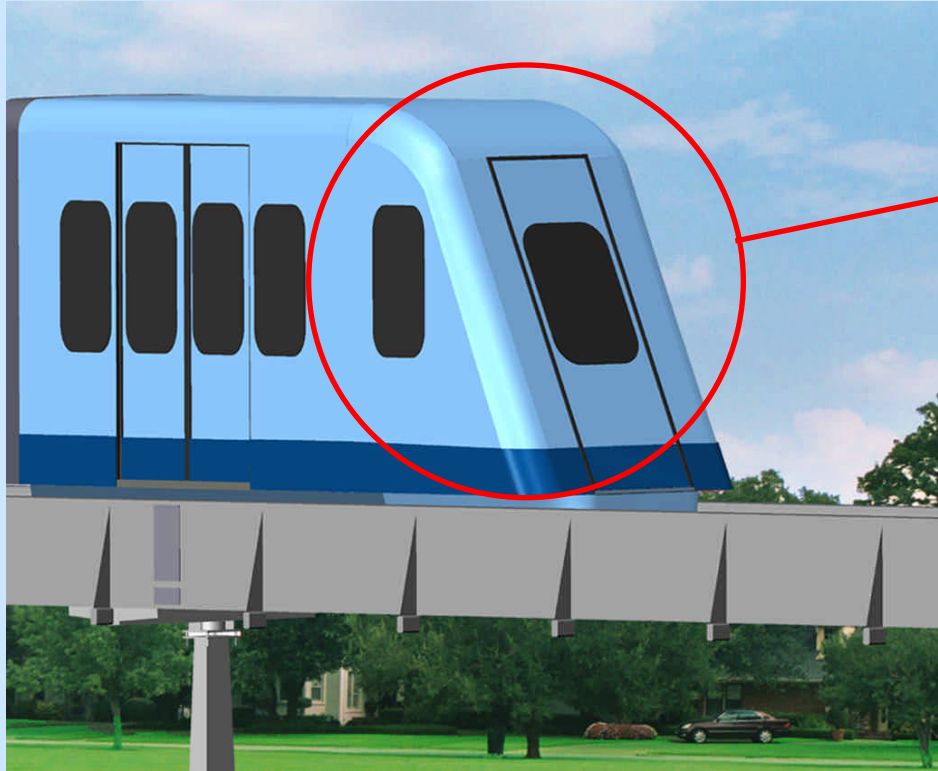


Single guideway rail cross-sections



Conventional off-the-shelf Train Control Used

Used on light rail systems for over a century

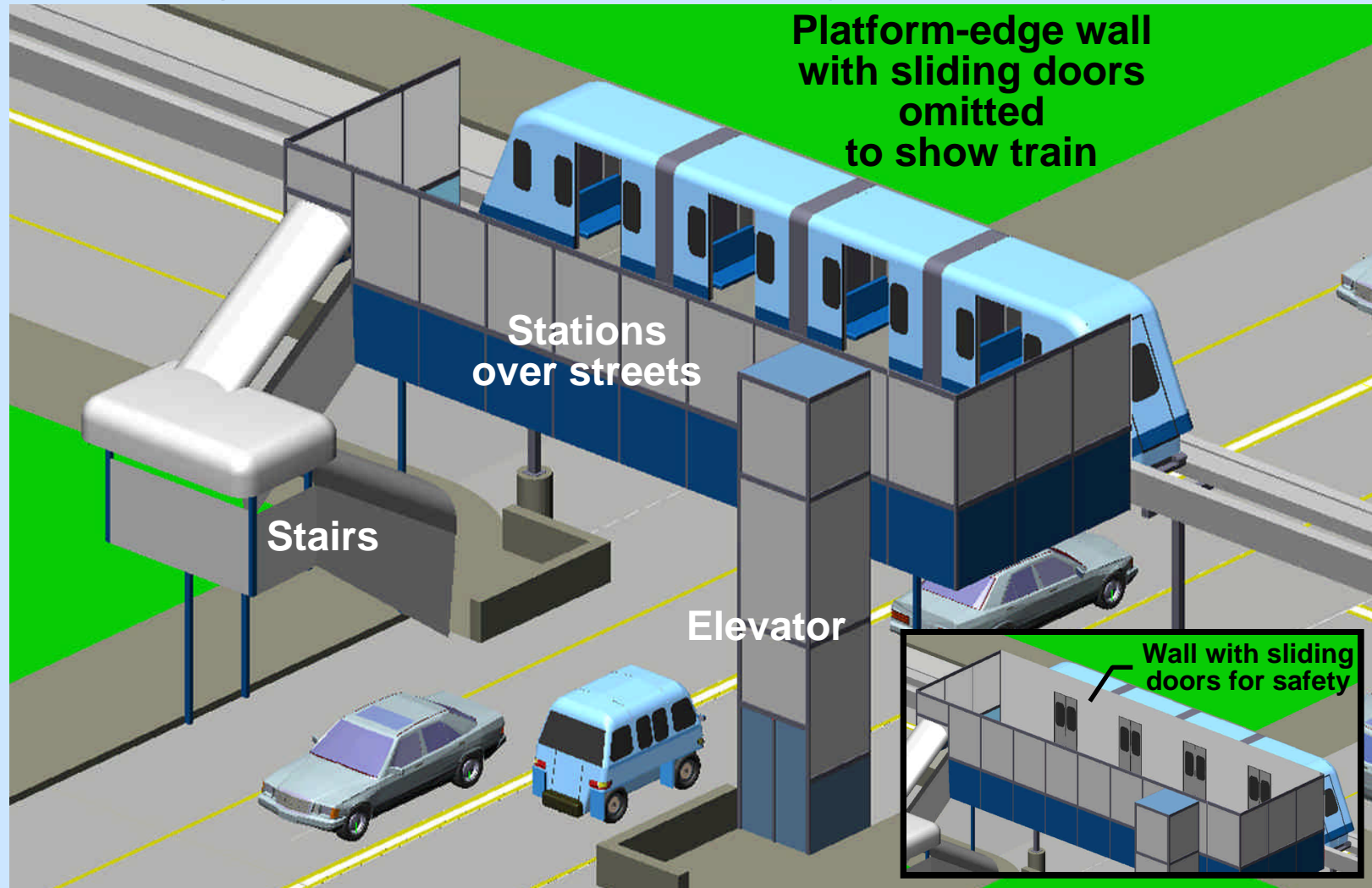


Motorman
in
lead car

**AUTOMATED
AFTER
FOUR YEARS**

- Manual speed and brake controls
- Precise in-cab signaling for close train spacing

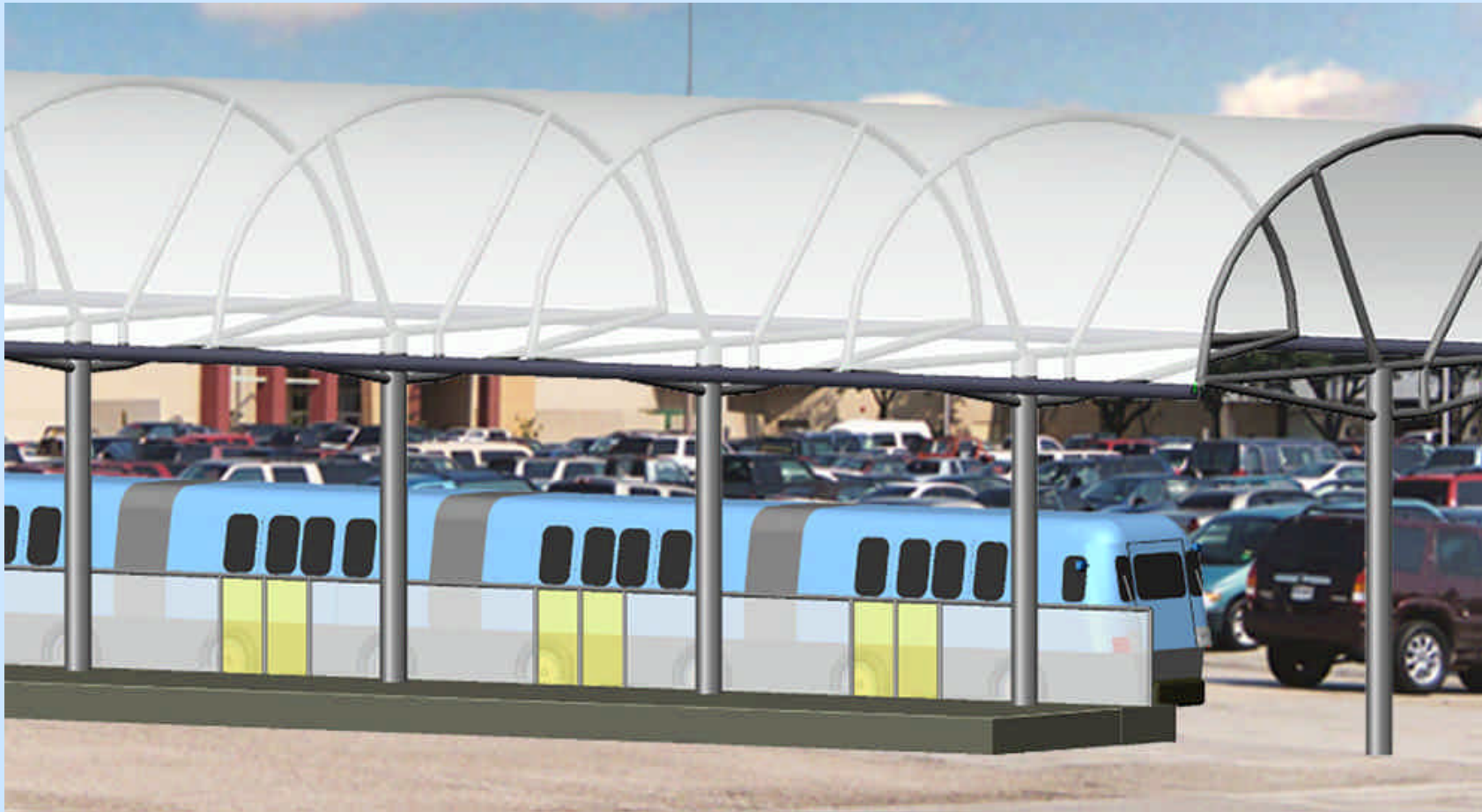
Factory-built, Modular *SkyCoach*[™] Stations



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

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

Modular, **Street-level SkyTram™ BRT Stations**



Dualmode *MicroRail™ SkyTram™* provides BRT service to stations on parking lot or on streets

- **Low-maintenance stainless-steel**
- **Low cost**
- **Minimum ground space**

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

U.S. Patent 6,837,167



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



Upward view through walkway

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

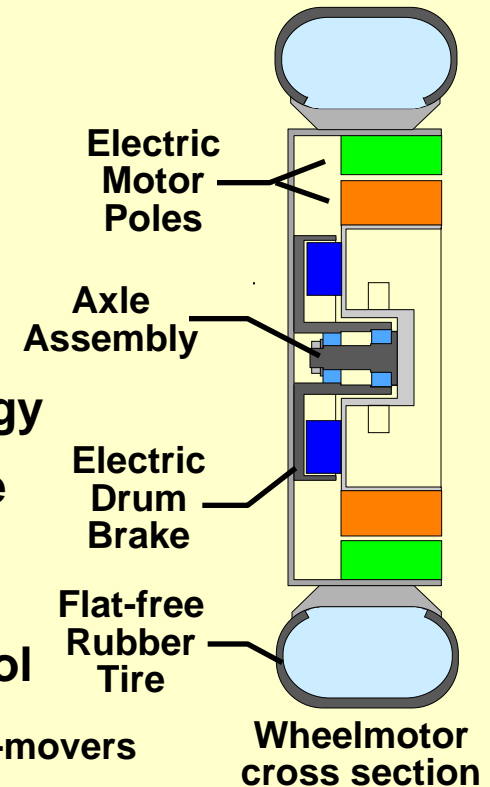
Flat-free tires – Current car tire technology

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!

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

Future “Last Mile” Problem **Solutions**

Fully Automated, 24/7 services in 48 Months

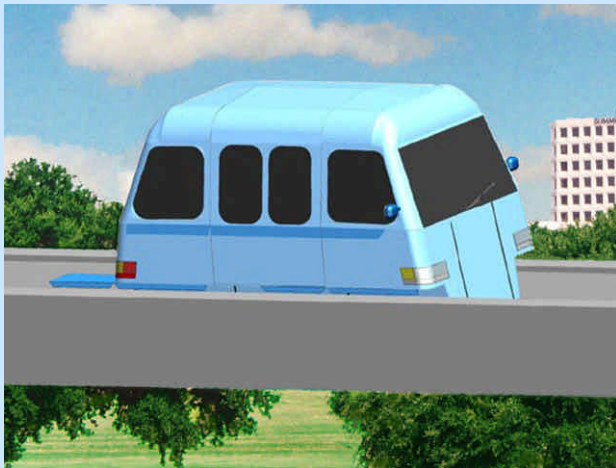


PAT service



Carferry™ service

Dualmode electric & hybrid-electric automobiles



Automated personal dualmode automobile service on guideways



Dualmode personal automobile service on ordinary streets

MicroRail Summary

Performance – Beats heavy monorail, LRT, streetcar & BRT

- Up to **36,000 pphpd** (300-ft stations) – 24,000 pphpd (200-ft stations)
Conventional monorail capacity = 7,500 pphpd
- Shorter trip times • **Bus-type** hill capability • **Dualmode serves more**

First service – **Within 36 months!** – (LRT type manual control)

- Much less than typical monorail, LRT & BRT – **No funding delays**

Total system cost – **15 - 20%** of typical monorail, LRT or BRT

- 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**

Monorail, BRT & Freeway Alternate **Available NOW**

• **Low Cost**
• **Low Tech**
• **Low Risk**



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