MicroWays™ Solve Urban Public Transit Problems

Small Cars & People above Street ROW

Electrically powered

Streets free of streetcars and LRT

Clean Natural Gas Power – No Street Impact

MegaRail. Transportation Systems, Inc.
Fort Worth, Texas

MegaRail, Superway, CarLiner, CarFerry, SkyCoach, CargoLiner, WhisperLiner, MegaLiner, & Person Liner are trademarks of MegaRail Transportation Systems, Inc.

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/BRT & Streetcar Guideway Problems

Light rail is not light weight — Must support 149,000-lb cars
  • Heavy-duty bridge structures needed

Guideway — Railroad 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

Much lower cost, less intrusive answer needed
Critical Cost & Time Impacts
LRT, BRT & Streetcar systems

High initial cost – $30 to $70 M / mile (US)
- At-grade LRT - $30 – $70M/mi – (Avg. $45M/mi)
- BRT – $2 TO $25 M/mile
- Streetcar systems slightly lower
  ( Typically $16 - 40-M per lane-mile )

High O&M costs – 15 - 25% from fares - No Positive ROI

Long wait time – Often 6 to 12 years
- Heavy construction required
- Long and major traffic disruptions for installations

Federal money for any of the above – Hard to obtain!
Now The 21st Century **SuperWay**

**Typical 14-ft freeway lane**  
12-in concrete  

**Current freeway lane**  
- Wheel supports in stainless steel wheelways  
- Tires  
- U-shaped cross-ties @ 5-ft spacing  

**Freeway active parts**  
- Only parts supporting car  
- This part is waste  

**SuperWay basics**  
- Pwr shoes  
- Wheel supports & pwr bars  
- Weatherproof wheelways  

**SuperWay basics**  
- Inside power & steering bars  
- Inside power & position sensors  
- RAIN, SLEET, OR SNOW  

**Weather-proof wheelways**  
- Offset axles  
- Add upper & lower weather guards  
- Inside power lines  

**Efficient, electrified super-freeway with autosteer capability**  
- Change to steel road & efficient shaping  
- Rubber tires & hub motors  
- Factory-built, elevated, electrified, green, weatherproof **SuperWay**  
- Round concrete piers  
- Stainless T-post uprights @ 50-ft  

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**MICROWAY-1**
SuperWay Urban Transport Solution

Real Solutions to Critical Problems

- Freeway & street congestion reduced
  - Reduced car traffic
  - Fewer slow buses to slow traffic

- Critical air pollution problems solved
  - System fueled by clean-burning natural gas!

- Sustainable urban transit - Can pay for itself
  - Up to 65-mph MicroWay public mass transit
  - 65-mph MicroWay electric CarFerry™ service

- Nothing added to impede traffic
**MicroWay™ Builds on What We Have**

**Easy Adoption by Public Users**

- Elevated over street right of ways
  - No interference with current streets

- No new personal user vehicles needed
  - Low-cost public system equipment purchases
  - Little change in current travel methods

- Current & affordable technology
  - Easy, current production methods
  - Current installation & construction methods
Affordable 65-mph MicroWay™ Mass Transit

Ultralight, All Weather Multi-mode SuperWay

- Small, low-cost, low-maintenance, elevated SuperWay
- Silent & ultra-low air pollution – Natural gas powered
- No added right of way, ground or street traffic lane impacts
MicroWay™ Skycoach™ mass transit service

MicroWay – Affordable mass transit
- Whisper-quiet smooth ride
- Most passengers seated
- Grade-separated for safety
- Safe, derail-proof design
- All-weather service
- 65-mph top speed
- Service in 42 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

65-mph ultralight MicroWay transit train

MicroWay – Ultra-light, comfortable SkyCoaches
- 3% LRT car weight
- Self-propelled
- Long-life stainless
- Rubber tires
- Air suspension
- Air conditioned
- 11-13 pass. cars

Coaches carry up to 13 and seat four to six

16 to 25-car trains – 176 to 275 passengers per train
City-wide 65-mph Dualmode Car Service

- Standard personal cars and passengers on elevated SuperWay
- Silent & ultra-low air pollution – Natural gas powered
- Share same guideway as mass transit services

Door to door service in your own automobile
You ride and don’t drive!
Midsize and smaller cars!
You ride in your car on Carferry™
Avoids traffic congestion
**CarFerries™** allow people to take their cars

Rapid (1-min) loading and unloading by car drivers at stations

CarFerries provide fast Load & Unload

- People in cars that need their cars
- People in *Skycoaches* who don’t need cars

Individual CarFerry Safety Features

- Side escape walkways
- Guideway rails
- Car support tracks
- Side railings
- Doors may be opened for escape

Ferry walkways enable passengers to access SuperWay center emergency walkways

Roll correction in curves for airliner ride comfort level

Car drivers drive their cars onto and off of ferries at stations

Easy as pulling into slant parking space or car wash

Car wheels automatically lock into place on ferry to hold car
Sample *CarLiner*™ Station Arrangement

Short *Carliner* train shown to simplify illustration

Drivers enter line for desired route or destination

(Trains may take different *MicroWay* routes)
Dualmode Solves “Last Mile” Problem

Typical fixed route 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 or streetcar line

Light rail stations (one to two mile spacing)

Economically impossible to provide lines to all points

Desired service area (Now served by buses or nothing)

Dualmode cars solve problem

Typical max walk distance (1/8 mile)

Only the carless & a few others use fixed route transit

Expensive BRT has offers only a partial solution
Expanded **MicroWay** Capability

**All LRT & streetcar capabilities plus dualmode cars**
- **SuperWay** stations – Over streets – Elevators / stairs in parking lanes
- **SuperWay** short turns (30-ft) to follow street corners
  - All Electric operation
  - Natural gas generators along lines

**Dualmode personal car service – Full citywide service**
- Shares passenger train **SuperWay**
- Electrical **SuperWay** operation
- On & off-**SuperWay** transport
- Normal car street operation

**Easy expansion – Affordable extension throughout area**
- Use available bridges or new, lightweight suspension bridges
- No traffic lanes impacted
- Minimal installation impact

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

*PAT. PENDING*
**MicroWay™ Easy Fit over City Streets**

Two-way *MicroWay* Lines over Wide Street

- Up street *MicroWay*
- Down street *MicroWay*

- Bus Lane: 12’
- Bike Lane: 6’
- Sidewalk: 18’
- 13’

Easy Fit over City Streets

MicroWay™
Ultralight, Low-cost Factory-built Columns

- Natural gas supply lines
- Dual gas-powered generators
- Stainless-steel factory-built columns – from steel sheet
- Cross-arm bolted on
- Sits over tapered spud on concrete base
- Base is 24-inch round poured concrete pier in ground (30-inch for dual guideway) (Slightly larger for steep curves)
Ultralight, Low-cost Factory-built **SuperWay**

- Factory-built wheelway tubes
- Open center passes snow & light
- Emergency mesh walkway
- 6.5 - ft x 2.7 - ft
- Factory-built cross members
  - Plasma & laser-cut flat stainless-steel
  - **Machine welded for low labor cost**
  - Truck to site & lift onto uprights
Electrically powered from protected bars

Weather-proof operation

- Power bars in enclosed tubes
- Can’t ice up and stop operation
- Power collectors are inside
- Protected by weather guards
- Power distribution lines inside

Powered entirely from clean-burning natural gas from lines under guideway
Enclosed wheelways for all-weather operation

- No snow plowing
- Climb 10% grades
- Always full speed

TIRES & HUB MOTORS INSIDE
TRACTION SURFACES FULLY PROTECTED
OFFSET AXLES THRU INVERTED SLOTS
RAIN, SLEET, OR SNOW

Perfect for winter weather service
MegaWay – Self-funding Alternate that Works

- Elevated steel SuperWay over any right of way
  - Electrically-powered from natural gas – Low pollution
  - Rubber-tired wheels in enclosed wheelway tubes
    - Silent service
    - All-weather service
    - Up and down hills
    - Low-cost SuperWay
  - Small wheelway tubes for low visual obstruction

- Little new right of way – Minimum land use
- Serves ALL users – TAKES TRAFFIC OFF ROADS!

Ultralight, stainless-steel structure
Long-life, no rusting
Minimum sky blockage – No wide elevated train shadows
Open-center SuperWay casts small shadow

Low risk – Current, proven technology!

U.S. Patent 6,837,167
Center Emergency Escape Walkway

Safe passenger emergency escape

- Welded stainless-steel wire mesh between tubes
- Easy passage of light & snow
Prototype Test Vehicle

In road and SuperWay proving

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

Not just another “paper” system – It’s real and here!
Future “Last Mile” Problem Solutions
Fully Automated, 24/7 services in 52 Months

Automated CarFerry service
- Drive to CarFerry station
- Drive onto waiting CarFerry
- Select destination
- Mid-size and smaller cars
- Ride without driving to desired station
- Drive back to street and to destination

PAT passenger service
- Walk to nearest station - Any time of day
- Enter waiting car (up to four people)
- Select destination
- Ride, non-stop to selected station
Technology Summary

Unique, patented new combination of proven technology (8 patents)

Enclosed stainless-steel wheelways - US Pat. 6,039,135
- Simple welded steel factory fabrication
- Standard electrical power buses

Flat-free tires – Current car tire technology

Permanent-magnet electric motors
- Current commercial motor technology
- Electric motor wheels – current electric car use

Car-based steering & switching
- Smooth non-contact electronic steering control
- Switching – By cars as on conventional freeways!

Only the combination & SuperWay are new!
MegaRail Staff is Highly-experienced

- Experienced aircraft engineers & business personnel
  - Experience level – 40+ years on far more complex systems
  - Managed 30,000 people, many vendors & $4B+ contracts
  - Developed, & supported the USAF B-58, F-111 & F-16s
- Staff understands long-term support
  - Includes experienced logistics & vendor support people
- More highly experienced personnel available
  - Similar experience levels in all required fields

MegaRail team able to provide complete systems
Proven Industry Team

**MegaRail Transportation Systems**
- System Design & Integration
- Prime Contractor

**Control & Software**
- MegaRail Design
- Outside Harness Production
- Outside Electronics Production

**Clark’s Precision Machine**
- Vehicle Production
- SuperWay Production
- Ramp & Station Production

**Austin Bridge**
- Site Engineering Design
- On-site SuperWay Assembly
- Pier & Superway Installation

Reduced Customer Risk
Major *MicroWay* Benefits

- **Near-term, low-cost transit & traffic solutions**
  - Public / Private partnerships possible
  - No more costly light rail projects!

- **Minimal physical & visual impacts**
  - Adds only small, stainless-steel *SuperWays*

- **Reduced commuting times & reduced cost**

- **Major reduction of traffic noise & air pollution**
  - Drivers find *MicroWay* lower cost and faster commute

- **All-weather travel – No rain, snow & ice impacts**

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Win, win approach to problems!
**MicroWay Summary**

**Performance** – Beats any other approach

- Up to 6,500 cars / hour / direction – **More than 6-lane freeway!**
- Shorter trip times • 10% grade hill capability • Off-line stations!
- Mass transit train & dualmode automobile for full city service

**First service** – **Within 48 months!** – (Train-type manual control)

- Joint private / local funding – **No Federal funding delays**

**Total system cost** – **$6 – 7M per lane-mile** (Typical cost)

- Local funding and control • **No on-going operating subsidies**

**Environment friendly** – Low emission – Uses natural gas!

- No earth moving • No new right-of-way • Noise free
- No impact to street traffic capability
- No power substations or electrical lines

- **Low Cost**
- **Proven Tech**
- **Low Risk**
Suggested, Low-cost, Low-risk Action

- Compare *MicroWay* with LRT & BRT
  - Cost per lane-mile
  - Area of city served

- Compare *MicroWay*, LRT & BRT total risk
  - Technical & schedule
  - Long-range cost risk

- See *MicroWay* prototype demo

- Request & evaluate *MicroWay* proposal
**MicroWay Results**

- Reduce street traffic – Use elevated alternate
- End freeway traffic jams
- 65-mph, non-stop travel in our own cars
- 65-mph, non-stop mass transit train service
- Gas-generated power for low air pollution
- All-weather travel – No rain, snow & ice impacts
- Avoid billions for light rail or BRT lanes

Nothing else offers anything close!
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