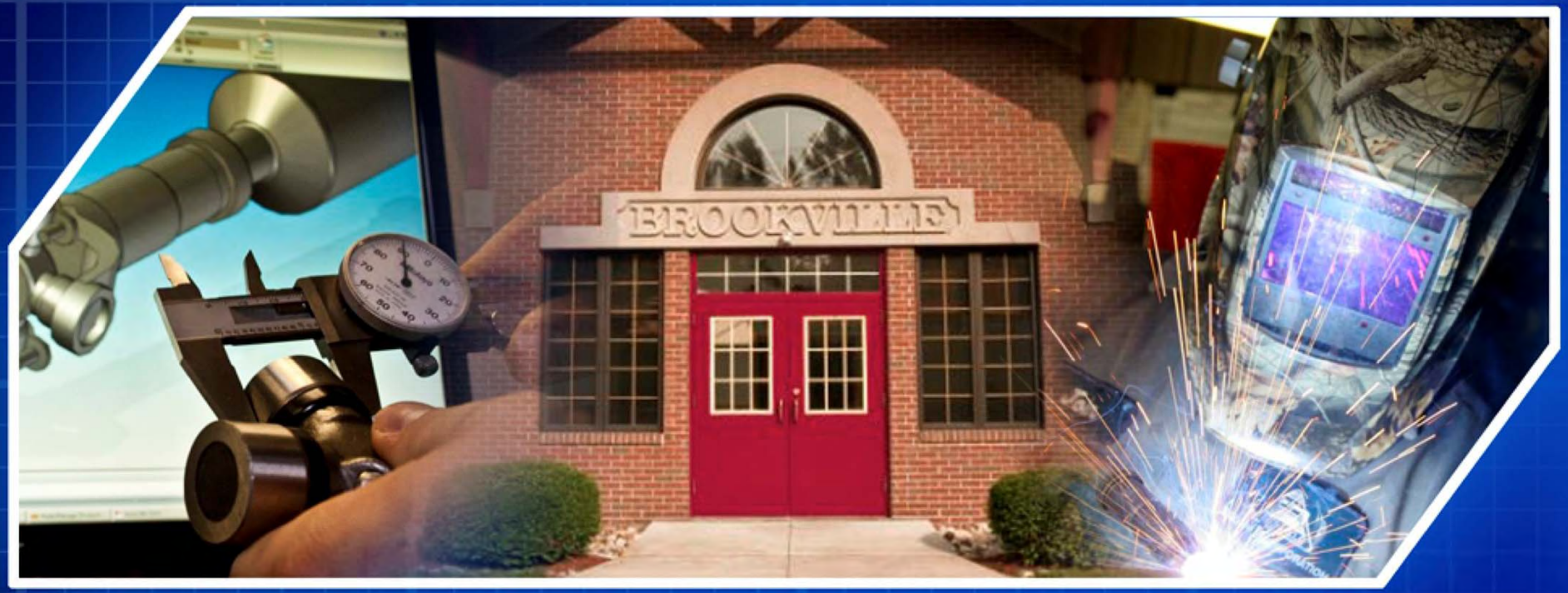
BROOKVILLE



Brookville is ...

A WORLD CLASS AMERICAN MANUFACTURER

Brookville Equipment Corp.

- Founded in 1918
- OEM of rail vehicles
- Manufactured over 4,200 rail vehicles
- Produced 66 vehicles with Energy Storage Systems
- 68 Streetcars running in USA

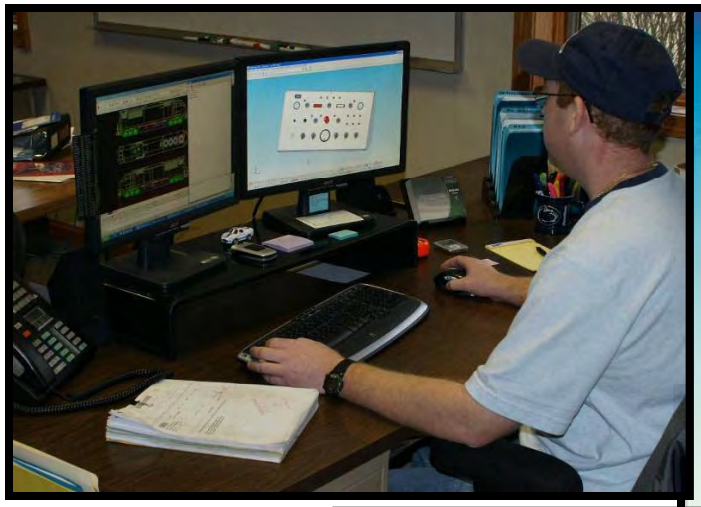
1927 – 28 passenger rail bus

Main Production Facility

- Established American Manufacturing Since 1918
- Engineering, Design, Manufacturing, Testing and Service all located in single location

Unsurpassed Engineering & Design

- In-house Engineering and Design Departments
  - 5 : 1 Manufacturing to Technical Ratio
- Efficient and Controlled Engineering
- Innovations & Advancements: Multiple Patents
  - Trolley Pole Patent



BROOKVILLE

AutoCAD

ANSYS

SOLID EDGE

ALGOR

SYSTRA RAILSIM

Markets for Rail Vehicles

Battery, Trolley & Diesel Mining & Tunneling Vehicles

Streetcars

Passenger Locomotives

Freight Locomotives

BROOKVILLE

Streetcar Projects

1. **New Orleans Transit Authority (NORTA)**
   - 31 streetcars

2. **Southeastern Pennsylvania Transportation Authority (SEPTA)**
   - 18 streetcars

3. **San Francisco Municipal Transportation Agency (SFMTA)**
   - 17 streetcars

4. **Walt Disney Corporation**
   - 2 streetcars

BROOKVILLE

Proven History - Modern Systems, Subsystems and Components

Proven Historical Success

- IGBT AC and DC Propulsion Systems
- Regenerative and Dynamic Brake Systems
- Wireless Induction Charging Systems
- Dual Control
- Proven Soft-Ride Trucks
- Proven HVAC systems and ducting
- Collision Energy Management Systems

BROOKVILLE

Proven Truck Design

Modern Streetcar Truck

- 49 streetcars running in everyday revenue service starting in 2001
- Proven in service with AC and DC traction motors
- Improved ride quality
- Reduced noise
- Increased reliability

Proven Propulsion & Control Systems

- ABB propulsion package is proven operationally on over 500 vehicles worldwide & in the USA
- Redundancy with ABB propulsion system
- TMV Control System is the latest in vehicle and traction control
- TMV Control System is proven on 31 streetcars in operation in USA since 2002
- User friendly touch screen display with remote diagnostics

Proven HVAC System

- Thermo King HVAC system proven on major systems throughout the USA (CTA, NYCT, Amtrak, etc)

- Thermo King LRV Unit is efficient, self-contained, low-profile, roof mounted unit

- 4.3 tons cooling & 10 kW overhead heating per unit
  - 3 units = 12.9 tons & 30 kW
  - 4 units = 17.2 tons & 40 kW

Proven Carbody Manufacturing

- Manufacturing workforce expert craftsmanship of LRV carshells
- Highest manufacturing standards of ASTM, FRA, APTA, AWS
    - Qualified welding on corrosion resistant, carbon and stainless steels, and aluminum

Interior Fit and Finish

- History of Modern Interior Designs
- Known for attention to fit and finish details
- Passenger and Operator Ergonomics
- Lighting
- Passenger Comfort & Safety
- CFD analysis for HVAC

Liberty Streetcar

- Carbody Design - Proven
- Propulsion Package - Proven
- Trucks - Proven

Liberty Streetcar

- Over 70% low floor
- Single step to high floor area

Customization Options

Regular Package Options

- Available in two body widths (8ft or 8ft 8in)
- Various Seating Arrangements
- Different Door Configurations
- Differing body trim and paint schemes
- Operators compartment configuration
- Bike Storage
- Fare box / payment system
- Pantograph

Standard Options

- Energy Storage System for off-wire operation
- Multiple Unit Operation

Dallas Streetcar Project

- Downtown Dallas to Oak Cliff
- Awarded in March, 2013
- Two Streetcars w/ Option of Two
- 8 Feet (2.46m) width vehicle
- ESS system for off-wire operation
- 1.5 mile line w/ 1 mile off-wire
- Delivery End of 2014

BROOKVILLE

Service & Support

- Dedicated Service Department
- Educational Operator & Maintenance Training
- On-site Field Engineer for Entire Warranty Period
- Remote Diagnostic Capabilities
- Various Extended Service Packages Available

BROOKVILLE

What You Get With BROOKVILLE

- Unrivaled Engineering
- Established Skilled American Manufacturing
- All Under One Roof in One Location
- Proven Track Record
- **Customer Satisfaction is #1 Priority**
- **Partner - not just a supplier**

Where commitment, quality, and experience combine to benefit the District of Columbia

Alternatives Analysis
Union Station - Georgetown

Supplier Questionnaire

April 3, 2013

Liberty Streetcar

BROOKVILLE®

Brookville Equipment Corporation (BROOKVILLE) is pleased to provide a response to the District of Columbia's Alternative Analysis for the introduction of premium transit service from Georgetown Waterfront to Union Station. We understand that sections of this alignment may limit the use of overhead wires and BROOKVILLE currently has a solution for situations such as this.

BROOKVILLE is currently engineering, designing, and manufacturing Modern Liberty Streetcars for the City of Dallas which are equipped with an onboard Energy Storage System (ESS) to allow the streetcar to operate for extended periods without the use of overhead wire. Please find responses to the questions provided below.

Question #1

The District will consider designs which allow for the use of an in-street conductor which supplies power to the vehicle continuously while operating, a system with long gaps in the overhead supply and wired areas for recharging while operating (batteries), or a system which charges an on-board storage system only when stopped at station platforms (supercapacitors or flywheels). Which of these types of systems have you supplied vehicles (rail, bus, or other transport) for? Or, are in the process of supplying? Do you have any comments on the advantages or disadvantages concerning the three system types?

Response

We currently have supplied rail vehicles with on-board ESS battery systems. The ESS systems have been charged by overhead wire, or by non-contact inductive transfer charging. We are currently in the process of supplying a lithium-ion ESS solution to the city of Dallas in a Modern Streetcar. The current Dallas alignment has a 1 mile off-wire section, with total system length of 1.6 miles.

Supercaps advantage gives you a higher power output for short duration accelerations compared to a battery solution. Supercaps recoup braking energy more efficiently than battery, and charge at higher rates. They have a higher cost per kwh and lower energy density.

Batteries advantage gives you a higher energy capability for longer duration off wire systems.

Possible combination of super caps and batteries for a multiple start/stop wireless section. Areas of concern with combination are cost, space, and complexity.

Question #2

A traditional streetcar is designed to operate from an overhead supply system operating continuously at either 600 or 750 Vdc. Would your company's offering place any special or additional requirements concerning integration of the electrification system? Would your technology operate with a pantograph when not on a wireless section?

Response

We would not require any additional requirements from the electrification system. Our streetcar would operate with a pantograph when not on a wireless section.

Question #3 – In Street Conductor

Has the in-street conductor been utilized in areas which normally experience snow and ice in the winter? What material would you use for fabricating in-street conductors? Would the material show corrosion for the application of de-icing road salt? What provisions are made to prevent snow plow blades from damaging the rail?

Response

Not Applicable. The current Liberty Streetcar ESS system does not utilize an In Street Conductor.

Question #4 – In Street Conductor

Has the in-street conductor been installed in mixed use traffic lanes? Has it been installed in reserved lanes with normal traffic operating at right angles across it? Have there been any issues related to cleanliness resulting from contamination with rubber tire, oils, or autumn leaves?

Response

Not Applicable. The current Liberty Streetcar ESS system does not utilize an In Street Conductor.

Question #5 – In Street Conductor

How is the conductor installed in the street? Are there any restrictions on horizontal or vertical curvature of the pavement? How are crossings or turnouts implemented with the conductor rail? What clearances are required for other structures such as manholes and metallic covers?

Response

Not Applicable. The current Liberty Streetcar ESS system does not utilize an In Street Conductor.

Question #6 – Batteries

Which battery type do you have experience in applying, Lithium (Li) or Nickel Metal Hydride (NiMH)? What is the maximum acceleration rate and maximum speed normally used in these applications?

Response

We currently have experience with Lithium-Ion battery technology. Our current design utilizes a 2.0 mphps acceleration rate for weights between AW0 and AW2 for speeds between 0-15 mph on level tangent track. Maximum speed maybe limited.

Question #7 – Batteries

What are the design limits and emergency limits for charge/discharge levels of the batteries on your vehicles? Is the battery management system provided by the battery manufacturer, third-party specialized supplier, or incorporated into the propulsion system? Are the individual cells monitored?

Response

Although the Lithium-Ion Battery can discharge or charge at very high C-rates, we are limiting our battery to a maximum discharge rate of 4C-5C, and a charge rate of 1C. At higher discharge or charge rates the cells will produce more heat, which is detrimental to the overall life of the cell.

Question #8 – Batteries

The operating environment in DC has a temperature range of -15 ^{0}F to 106 ^{0}F. What will be used for the cold temperatures to ensure proper operation of the system? Do the high temperatures with added solar heat gain prove detrimental to the batteries? Is a heating and cooling system typically provided for the batteries?

Response

Our design utilizes a thermal management system which has the capability of heating or cooling the battery dependent upon the ambient/battery module temperatures.

High temperatures are detrimental to the batteries. The Lithium-Ion batteries optimal operating temperature range is from 85 F to 95 F.

Yes a thermal management system is provided with our battery solution

Question #9 – Batteries

There is a concern with impacts damaging Li batteries with fires resulting days later. This was observed during crash testing of the Chevy Volt. Are the batteries located in an area susceptible to impacts in traffic accidents? Have you established criteria for maximum impact shocks and have the criteria been validated by the battery manufacturer?

Response

Due to the design of the Chevy Volt cooling system, in which coolant was in direct contact with the cells, the coolant leaked, crystallized, and shorted the cell which was the cause of the fire. Our thermal management system does not have the coolant in direct contact with the battery cell.

Our batteries are located undercar on the A/B end carbodies. The battery enclosure is centered under the carbody. A crash analysis is being performed to determine the need for impact protection to the ESS system.

The battery manufacturer impact/shock criteria, which are being incorporated into our ESS system design.

We have incorporated several design features which maximize the safety of the Lithium-Ion battery. For example we operate at a lower SOC, battery management system monitoring, high voltage disconnecting contactors, and battery module construction

Question #10 – Batteries

Batteries will be discharged during overhead gaps and recharged while operating in wired sections. As a "ball-park" approximation, if a streetcar traveled three miles off wire with 6 stops on an average 2% grade how long would the vehicle need to travel on wire to fully recharge? What would be the maximum current draw for battery recharging?

Response

Without specific alignment details, stop durations, speed, etc it is very difficult to determine the energy we would need for this specific scenario. However, making some "ballpark" assumptions we estimate the need to charge for 30-45 minutes to recharge the batteries keeping the 1C charge rate.

We would need approximately 133 amps from the overhead supply for battery recharging.

Question #11 – Batteries

If a stationary vehicle draws the maximum current for battery recharging in addition to the vehicle's maximum auxiliary power requirement on a 106 ^{0}F day in full sun with no wind, is it possible to heat a 350 kcmil overhead contact wire to the 160 ^{0}F annealing temperature of the copper? If so, what measures may be taken to mitigate this concern?

Response

Our pantograph is designed for a maximum stationary current of 200 amps. Our typical stationary current draw with maximum auxiliary power and battery charging will be approximately 150 amps.
If required, further investigation would have to be conducted with our pantograph supplier.

Question #12 – Supercapacitors

What is the time required to recharge fully depleted supercapitors at a stop? What level of current and voltage is this time based on?

Response

Not Applicable. The current Liberty Streetcar ESS does not have supercapacitors.

Question #13 – Supercapacitors

For a discrete charging system, would your firm recommend a traditional supply system with distribution via underground conduit or smaller discrete chargers at predetermined locations? If discrete chargers are possible, what is the range of AC supply voltages that could be accommodated? Can a one-line diagram of such a discrete charger be provided?

Response

Not Applicable. The current Liberty Streetcar ESS does not have supercapacitors.

Question #14 – Supercapacitors

If station spacing of one-half mile (800 m) on a 2% grade and the streetcars stops for traffic signals every 500 ft (150 m) is used, would your standard vehicle be capable of passing a stop without charging while operating with the maximum auxiliary load, including HVAC? What would be the anticipated charge level remaining at the second stop?

Response

Not Applicable. The current Liberty Streetcar ESS does not have supercapacitors.

Question #15 – Batteries & Supercapacitors

Under lane-sharing scenarios, a Streetcar could be delayed considerably in traffic resulting in insufficient remaining charge to reach the next charging area. What is your strategy for minimizing this risk? Would additional storage capacity or capacity monitoring and load shedding (HVAC) be used? What is the possibility of recharging the vehicle in the street and what equipment would be recommended?

Response

Utilizing the battery management system we constantly monitor the State of Charge (SOC) of the battery. Our vehicle controller will utilize this information to start shedding loads at predetermined setpoints thus minimizing the risk of the car being stranded on a section of unpowered rail. Also, acceleration and speed limits will be reduced at a predetermined SOC level to help conserve battery power.
The vehicle is provided with emergency stowable couplers that can be used to move the car to a powered section of rail.

Question #16 – Vehicle Design Criteria

The District currently owns three T12 streetcars manufactured by Inekon and has three American-built versions of the Skoda T10 streetcars on order. These vehicles use the standard Czech width of 8 ft (2.46 m). What are the implications of continuing to use such European dimensions? Would you be interested in proposing on a small order of 8-10 cars with this width requirement? If no, what is the minimum order size you would be interested in? Would you prefer using the typical US width of 8 ft 8.3 in (2.65 m)?

Response

The Liberty Streetcar is currently offered in two standard vehicle widths. The narrow 8 ft (2.46 m) vehicle and the 8 ft 8 in (2.65 m) vehicle.

Question #17 – Vehicle Design Criteria

The District's current vehicle design criteria limit the length of the vehicles to 72.2 ft (22 m). Does this length permit sufficient space to mount energy storage devices on your standard vehicles? If not, what is the minimum length of vehicle your firm would be interested in providing?

Response

The Liberty Streetcar has a standard length of 66 ft which permits sufficient space for the mounting of our ESS solution.

Question #18 – Retrofit of Existing Vehicles

The District currently has vehicles with lengths of 66 ft (20 m) and width of 8 ft (2.46 m). If these vehicles are to be operated on lines with wireless sections they will need to be retrofitted. What would be the approximate space requirements if your technology were to be retrofitted? Are there any proprietary components that would be required? Do you have any experience retrofitting the system to older vehicles manufactured by you or others? Would you be interested in performing the retrofit work as part of a new procurement?

Response

Due to the many unknowns of the existing vehicle structural designs, areas available for ESS components, and the integration of the ESS into the existing electrical systems we do not feel this is feasible.

Question #19 – Specialized Equipment

What specialized equipment will be required to maintain your proposed energy storage and/or enhanced propulsion technology options? Will additional shop equipment or storage/charging rooms be required? Will test and troubleshooting procedures be impacted, particularly for high voltage storage devices on the vehicles? Please elaborate on the specific function and purpose of such equipment.

Response

No specialized equipment is required to maintain our ESS system.

Depending upon if spare battery modules/pack are purchased an intelligent battery charger maybe required for maintenance during storage.

Special test and troubleshooting procedures will be provided for the ESS system. The ESS system has midpoint contactors that reduce the voltage for safe trouble shooting.

PPE will be required at a minimum may be rubber gloves and cotton clothing, etc.

Question #20 – Training and Education

Will additional specialized training for vehicle maintainers, wayside maintainers, or vehicle operators be required? Will specialized personnel in any of these areas be required or would a typical maintainer/operator with a high school diploma and standard maintainer/operator training be sufficient?

Response

Additional training for vehicle maintainers and vehicle operators will be required.

Typical electrical technicians will be required to maintain the ESS system.

BROOKVILLE®

LIBERTY MODERN STREETCARS

BROOKVILLE entered the streetcar market in 2002, contributing to the first truly "Made in USA" streetcars since the early 1950s. We currently have 68 streetcars in operation in the USA.

The Liberty Streetcar, BROOKVILLE's new light rail vehicle (LRV) platform, uses industry proven systems, sub-systems, and components. It was engineered after consulting operations and maintenance transit agencies to address streetcar industry needs. The car has been designed by an American workforce, using the best proven technology from around the world, and packaged for the North American market.

A Unique, Cost-Effective Solution: BROOKVILLE designs, constructs, and tests at a single location, permitting a convenient and cost-effective inspection schedule. Operations and maintenance training is included and conducted at your location by former transit agency professionals with hands-on experience. The Liberty Streetcar also takes FTA safety and security protocols seriously, and includes documents needed for inclusion in the Safety and Security Plan.

Our Customers Include:

- San Francisco Municipal Railway (SFMTA)
- New Orleans Regional Transit Authority (NORTA)
- Southeastern Pennsylvania Transportation Authority (SEPTA)

Above: Liberty Streetcar with three passenger compartments.

Left: Interior of Liberty Streetcar with customizable seating arrangements.

Right: Interior of Liberty Streetcar with just a single step to high-floor section.

Left: Exterior of Liberty Streetcar with sleek, modern design.

On Track for the ENVIRONMENT

BROOKVILLE EQUIPMENT CORPORATION
175 Evans Street • Brookville, PA 15825 USA

WWW.BROOKVILLECORP.COM
Tel: 814.849.2000 • Fax: 814.849.2010

BROOKVILLE®

INNOVATIVE SOLUTIONS FOR MODERN STREETCARS

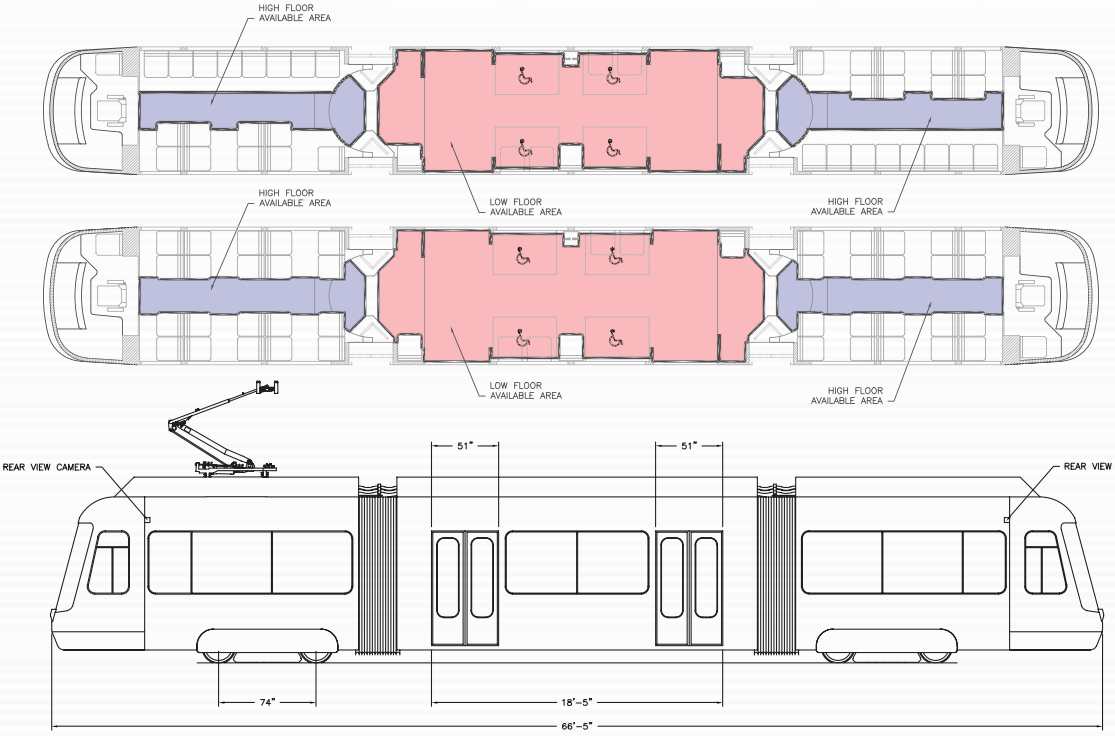
LIBERTY

Car Width
8 Feet
(2.45 meters)

Car Width
8 Feet, 8 Inches
(2.65 meters)

Smartphone Users: Scan this QR Code for more information on our Modern Streetcars.

Proposed Floor Plans Below Are Customizable For Your Specific Needs



Liberty Class Streetcar - Technical Specifications		
Track Gauge	Standard 4 Feet, 8.5 Inches	
Boarding Height	13.75 Inches (350mm)	
Power Supply	750 V DC (Max. 925 V DC, Min. 525 V DC)	
Low-Voltage Power Supply	24 V DC	
Motors	4 x 65 kW or 4 x 99 kW	
Maximum Speed	44 mph (70 km/h)	
Minimum Turning Radius	59 Feet	
Vehicle Length	66 Feet, 5 Inches	
Max. Height (w/o Pantograph)	11 Feet	
Wheelbase	39 Feet	
Weight of Car Empty	63,960 lbs (without off-wire capability)	
Acceleration	3.0 mphps (1.3m/s2)	
Brake Deceleration	3.0 mphps	
Emergency Brake Deceleration	5.0 mphps	
Maximum Grade	9%	
Vehicle Width	8 Feet (2.46 m)	8 Feet, 8 Inches (2.65 m)
Percentage of Low-Floor Area	71%	73%
Total Seating Capacity	41 Passengers + 1 Operator	47 Passengers + 1 Operator
Maximum Capacity (AW3)	127 Standees + 41 Seated + 1 Operator = 169	135 Standees + 47 Seated + 1 Operator = 183
Maximum Capacity (AW4)	170 Standees + 41 Seated + 1 Operator = 212	181 Standees + 47 Seated + 1 Operator = 229

Features of the Car Include:

- Single step design between low floor and high floor sections
- Over 70% low floor
- BROOKVILLE soft-ride trucks proven under 49 streetcars in USA
- Meets Buy America requirements

Standard Options:

- Two body widths
- Different door configurations
- Various seating configurations
- Various body trim/paint schemes
- Multiple Unit operation (MU)
- Propulsion upgrades for higher speed
- Energy Storage System (ESS) for periods of off-wire operation

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Kinkisharyo

Engineering
Sustainable
Urban
Transit

KINKISHARYO

beyond moving people

Who is KINKISHARYO?

KINKISHARYO has been customizing solutions for urban transit agencies worldwide for as long as there has been urban transit.

After designing and manufacturing more than ten thousand railcars, we continue to build on the heritage of technological innovation and customer service that have made us the number one supplier of low-floor light rail vehicles in North America. We know that each metropolitan area and transit system has needs beyond moving people safely and reliably. We tailor solutions to meet those needs.

From manufacturing to maintenance, from Dallas to Dubai, KINKISHARYO is delivering a full range of customer-focused, customized products and service that set us apart.

KINKISHARYO

Low Floor. Unlimited Ceiling.

high standards

About KINKISHARYO...

Policy

A Corporate Policy - A Customer Promise

Customer Focus
KINKISHARYO's long tradition of customization and innovation in vehicle design, outstanding manufacturing capabilities and maintenance proficiency provides our customers with the superior performance to meet their needs.

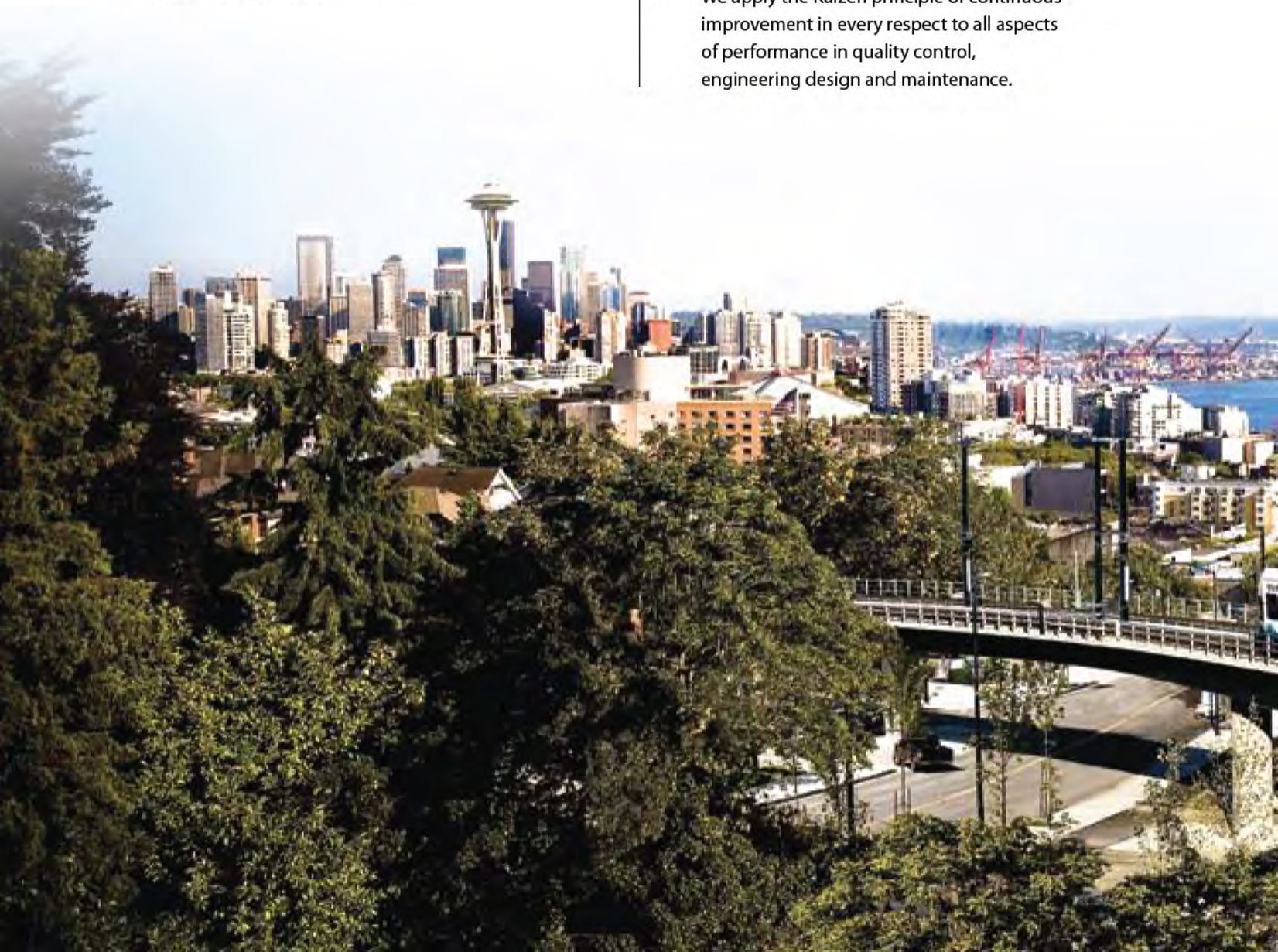
Our Mission
To provide high-quality products and services to our customers, on time and at a reasonable cost.

Strengths

Superior performance is why KINKISHARYO is the #1 manufacturer of low-floor light rail vehicles in North America.

Product Customization
Low-Floor LRV has evolved based on a standard platform.

Maintenance Proficiency
We apply the Kaizen principle of continuous improvement in every respect to all aspects of performance in quality control, engineering design and maintenance.



Technical Innovation

We're always finding new and better ways to enhance our rail cars. For example, we pioneered crashworthiness design, equipping cars with safety features like recessed couplers and energy-absorbent bumpers.

Safety & Reliability

Impeccable safety record - Reliability as much as 6x the industry standard.

Long-Term Customer Relations

Your needs aren't static; they evolve over time. We design the solutions you need to keep pace.

Local Presence

When we come to a city, we invest in its economy by establishing local facilities and hiring & training a local workforce.

Career Development

We're committed to helping our dedicated employees progress professionally. Many of our maintenance workers, for instance, progress to management positions.

On Time, On Budget.

Because we keep our promise of on-time and on-budget performance, you can keep your promise of opening your system on time without burdening taxpayers with additional costs.

success stories
KINKISHARYO... Innovations

Seattle, WA | Phoenix, AZ | Jersey City, NJ | Santa Clara, CA | Dallas, TX | Boston, MA | Dubai, UAE

Unique challenges. One-of-a-kind solutions.

To get a true sense of KINKISHARYO, what makes us different and what we can do for you, start by taking a look at just a few of the places we've been... and how we've met the needs of cities and their transit authorities.

In each case, the project was as unique as the city and presented a completely new challenge. We succeeded every time because we listened to the client, understood their needs and developed a customized solution.

KINKISHARYO is the #1 manufacturer of low-floor light rail vehicles in North America

1920 Kinki Sharyo Co., Ltd. is established in Japan

A History of Success

Explore our history of excellence in delivering innovative products.

success story

DUBAI

world class transportation

Client: { Dubai,
United Arab Emirates

Challenge:
New urban rail system rivaling the luxury & comfort of a fine automobile

Solution:
Best in class, fully automated metro system for fast, efficient & safe transportation

The city of Dubai, located in The United Arab Emirates, is in the middle of an enormous construction boom intended to establish the city as the jewel of the Middle East. Every building and every project is designed to make a statement. So naturally, for their new urban rail system, Dubai demanded the finest metro vehicles in the world. And that's exactly what KINKISHARYO delivered: a fully-automated, world-class system for a world-class city.

...the finest metro vehicles in the world...

1980
The company produces its 10,000th electric rail car

1986
100 light rail vehicles delivered to MBTA, Boston

success story

SEATTLE

on time and on budget

Client: { **Sound Transit**
Seattle, Washington • United States

Challenge:
Greener transit - on time & on budget

Solution:
62 environmentally-friendly, cost efficient low-floor vehicles

Seattle's Sound Transit was looking for more than just cleaner, greener railcars. They wanted a design that fit in with the vast beauty of the Pacific Northwest and matched the other vehicles in their transit fleet. But most critically, due to the high cost of operating a system in difficult terrain, they needed the cost efficient LRVs to be delivered on time and on budget.

KINKISHARYO met the challenge so well with the initial 35 low-floor vehicles, Seattle ordered an additional 27.

...delivered on time and on budget.
KINKISHARYO met the challenge...

1991
KINKISHARYO (USA), Inc. established in the U.S.

1999
KINKISHARYO International, L.L.C. established in North America

1995-2000
115 high-floor LRVs are delivered to DART, Dallas

success story

PHOENIX

safe and sleek success

Client: { **Valley Metro Rail**
Phoenix, Arizona • United States

Challenge:
Meet specific aesthetic and safety requirements

Solution:
Precise engineering, pioneering design

VMR asked us to develop safe light rail vehicles that could run in city streets with mixed traffic and to fit in aesthetically with the Phoenix area. It required precise human and industrial engineering at every stage of the design process.

To meet demanding safety requirements, we pioneered a crash energy management system that made us the very 1st car manufacturer to create a crashworthy low-floor LRV for North America.
With such features as recessed couplers and energy-absorbing bumpers, 50 of our custom-designed low-floor LRVs began service in 2008. They've proven their value by minimizing damage and injury in accidents.

...precise human and industrial engineering at every stage of the design process...

1997
20 additional LRVs are delivered to MBTA

1999 - 2003
Delivered 73 LRV's to NJ Transit, New Jersey

success story

JERSEY CITY

fast track to redevelopment

Client: { NJ Transit • Hudson-Bergen Line
Jersey City, New Jersey • United States

Challenge:
Rapidly increase passenger capacity, promote urban redevelopment

Solution:
DBOM Hudson-Bergen Line in 40 months

NJT needed to quickly add passenger capacity in a booming area near Manhattan. We responded by completing the project in an impressive 40 months from notice-to-proceed to in-service. The Hudson Bergen Line was the first Design-Build-Operate-Maintain (DBOM) transit operation in the U.S.

It was also the first in North America to feature a 70% low-floor light rail vehicle design. More than just moving people, it was about redeveloping an area where vacant brownfields once straddled the former Jersey Central line, which now stands a prosperous urban area thanks to the light rail.

...the first design-build-operate-maintain transit operation in the U.S...

2001
Delivered 100 LRV's to VTA, San Jose, CA

2006 - 2008
Delivered 50 LRV's to Valley Metro Rail, Phoenix

success story

SANTA CLARA

clean and environmentally friendly

Client: **Valley Transportation Authority**
Santa Clara, California • United States

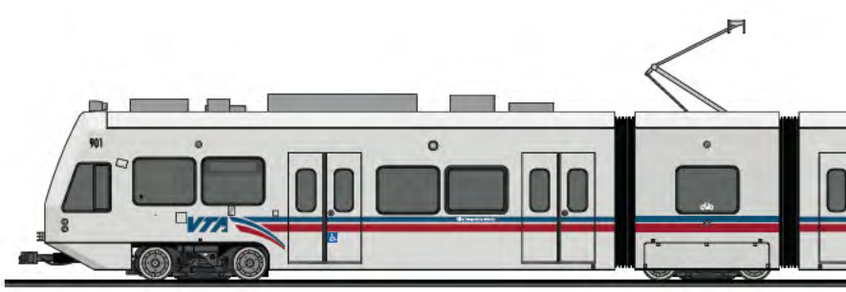
Challenge:
Expand & upgrade system to ease traffic congestion

Solution:
100 environmentally-friendly low-floor vehicles

The .com boom changed the landscape of California's Silicon Valley, bringing unprecedented prosperity, rapid growth... and traffic gridlock. With their public transit system straining to keep up with all this development, San Jose and Santa Clara County needed to quickly expand and upgrade.

KINKISHARYO designed and built 100 cars for the VTA to replace older fleet of step-well boarding cars with 70% low-floor direct platform-to-train boarding and interior bike racks. A fast, safe, environmentally friendly solution that's helping keep Santa Clara County moving in the right direction.

A fast, safe, environmentally friendly solution...



2008 - 2009
Delivered 35 LRV's to Sound Transit, Seattle

success story

DALLAS

customer commitment

Client: { Dallas Area Rapid Transit (DART)
Dallas, Texas • United States

Photo courtesy of DART

Challenge:
Increase capacity enhance ADA accessibility

Solution:
Innovative re-design for long-term customer

DART wanted to increase passenger capacity and enhance ADA accessibility without replacing existing cars or re-building platforms. This unique challenge called for an innovative solution: inserting new, custom-designed low-floor sections in the middle of their existing high-floor trains.

This innovation is known as the Super-LRV. The system opened in 1996 and continues to be one of the fastest-growing, most successful light rail systems in the country. And KINKISHARYO continues to play a major part in fueling the region's thriving economy.

This unique challenge called for an innovative solution...

The SUPER-LRV

2008 - 2010
115 low-floor C-cars delivered to DART

2010 - 2011
Delivered additional 48 SLRVs to DART

success story

BOSTON

custom engineering - seamless integration

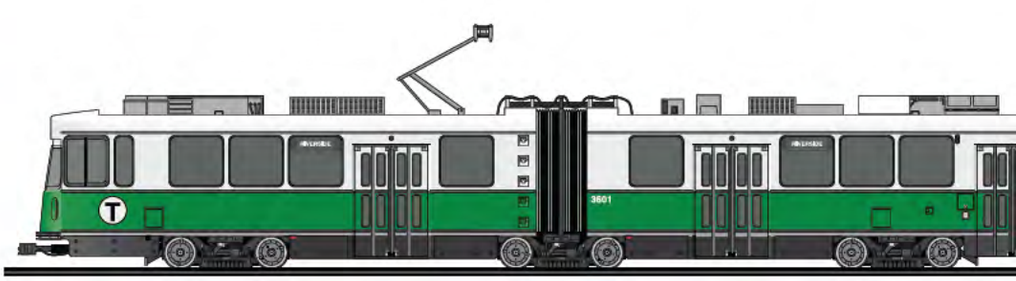
Client: { **Massachusetts Bay Transportation Authority (MBTA)**
Boston, Massachusetts • United States

Challenge:
Century-old rail system

Solution:
Custom-designed vehicles to work with existing system

In 1983, Boston's Green Line was in need of a new, reliable light rail vehicle that could maneuver through the ice and snow of New England winters. They looked for a company that could modernize the line yet work seamlessly with the vehicles, signaling & communications systems already in place.

KINKISHARYO delivered 120 custom-designed and engineered high-floor light rail vehicles. The safety & reliability of the vehicles, keeping the residents and tourists moving quickly throughout Boston, has been the key to MBTA's success.



2010 - 2011
Delivered additional 27 LRVs to Sound Transit

2011
ameriTRAM™ streetcar unveiled.
www.ameritram.com