I. Civil Conditions and Rail Car Dimensions

A. Track

1. Rail Type: 115RE Section, continuous welded, with 1:40 cant
2. Minimum lateral radius: 350 feet yard, 750 feet mainline, 500 feet interline connector
3. Maximum vertical grades: 0.5% yard, 3% mainline, 4.5% interline connector
4. Maximum super-elevation: 6 inches
5. Track gauge: 4 feet 8.5 inches nominal
6. Contact rail height: 3.5 inches +/- 0.125 inches above running rail

B. Stations

1. Station platform length: 600 feet, except Bankhead at 150 feet
2. Platform height: 44 inches above top of running rail
3. Distance from centerline of track to edge of finished station platform: 5 feet 4 inches

C. Existing Rail Car Dimensions

1. Length of vehicle: 75 feet
2. Distance, center to center, truck: 52 feet 6 inches
3. Width of carbody: 10 feet 6 inches (maximum)
4. Height of vehicle from top of rail: 11 feet 10 inches (maximum)
5. Centerline of coupler, from top of rail: 25 inches
6. Interior height from floor to ceiling: 6 feet 8 inches
7. Width of side door openings: 50 inches (minimum)
8. Height of side door openings: 6 feet 7 inches
9. Train size: 2 to 8 vehicles
10. Seating capacity per vehicle: 64 (target)

D. Rail Car Weight

1. Maximum empty weight of 81,000lbs.
2. Maximum fully loaded weight of 122,000lbs. ("AW-3")

II. RAIL CAR TECHNICAL FEATURES

A. Renderings and Mock-ups

1. Exterior Design Renderings – three options for MARTA to choose from.
2. Interior Design Renderings – three options for MARTA to choose from.
3. Seat Sample Choices – for public display/discussion
4. Would like to retain MARTA-distinctive shape of the rail car
5. Interior Signage Samples
6. Mock-up: TBD

B. Configuration and Fleet Compatibility

1. Configuration: Married-pair, with options for alternate configurations that fit MARTA's infrastructure and take into account train make-up provisions.
2. Train length optimized for 6-car consists, but able to also run 2-, 4-, and 8-car consists
3. 40-years life of carbody/trucks
4. Duty cycle of 120,000 miles per year
5. Incorporate recently installed Train Control System features
6. Precise station stop berthing positioning
7. Provisions for eventual unattended train operation (UTO)
8. Structurally compatible with existing fleet
9. Rescue compatible with existing fleet
10. Compatible with existing shops
11. U.S. service proven equipment

C. Passenger Comfort Features

1. Improved, more reliable HVAC with better humidity control
2. Improved signage for better wayfinding
3. Availability of signage for advertising
4. Wider aisles for improved circulation, especially when luggage is aboard
5. Large windows for sense of safety
6. Open gangway between car pairs for better circulation
7. Interior and exterior cameras for improved security
8. Interior and exterior signage and speakers, adjustable for time of day
9. Fully ADA compliant
10. Luggage storage

D. ADA Provisions

1. Level boarding, with load leveling system
2. 36" wide aisles
3. 36" wide train line doors for mobility aid accessibility between cars
4. Priority seating
5. One or two wheelchair positions per car (TBD)
6. Signage with proper contrast and lettering height
7. Floor markings for wheelchair space
8. Windscreens shortened/eliminated/offset for better wheelchair circulation

E. Interior Layout

1. Primarily transverse seating, with some longitudinal seating
2. Cantilevered seats for improved security and ease of cleaning
3. Upgrade seat design for better space efficiency
4. Windscreens to accommodate better circulation
5. Interior design to accommodate signage in wall-to-ceiling cove area
6. Multi-purpose area, leaning area

F. Carbody

1. A & B cars with open gangway on R end (optional)
2. Stainless steel or aluminum
3. 36" end doors and aisles to meet ADA requirements
4. Similar cross section to existing cars to maintain wideness at seat level
5. Load leveling system for level boarding

G. Trucks

1. Cast or fabricated frames and bolsters with a proven history of reliability
2. Oil injection on wheel hubs to reduce wheel dismounting losses
3. Truck-mounted flange lubricators

H. Side doors

1. Linear electric operators – one per panel
2. Microprocessor system control
3. Microprocessor door control units
4. Three pairs per each side of the car (48-60" openings)
5. Pocket or plug type (options?)
6. Better weather sealing on door openings and door panels
7. Platform-side door safety interlock
8. Proven operating system with high reliability
9. Ease of maintenance, troubleshooting, and adjustment

I. HVAC

1. Two units per car
2. Enhanced cooling capacity for improved passenger comfort
3. Unitized HVAC system
4. Scroll compressor for improved reliability
5. Compliant 407C refrigerant
6. HVAC powered by a separate HVAC inverter
7. Door threshold heating
8. High efficiency, roof mounted condensers
9. Reheat feature to lower humidity for improved comfort

J. Lighting

1. LED overhead lights
2. Door threshold lights
3. Larger head lights, dimmable – PAR 56-200 watts
4. Lights off time delay 20-60 minutes
5. Exterior LED front end lights for style
6. Exterior color-coded LED route lighting alongside of car, lit upon entry to stations

K. Operator's Cab

1. Full width cab, of similar configuration to existing cars
2. Train control system features, same/similar to recently upgraded system
3. Video screens of passenger area
4. Video screens for door control [TBD]
5. Time-delay aux off feature
6. Layover controls to maintain cooled/heated interior at modifiable set points
7. Wayside Detection System to detect MOW personnel
8. Instructors seat in cab
9. Redundant screens on console

L. Auxiliary Power Supply

1. Proven history of high reliability and low maintenance costs
2. Improved robustness for wayside transient voltage spikes
3. Distributed inverter technology (separate inverter for major systems)

M. Friction Brakes

1. Disc brakes or tread brakes

N. Propulsion

1. Efficient AC traction
2. Efficient spin/slide system
3. Proven grounding for traction motors and other truck mounted components

O. Coupler and Draft Dear

1. Compatible with existing coupler for rescue operation (or coupler adapter furnished, along with installation plan/on-board storage provisions)

P. Signage and Communications

1. Automated stop announcement system, keyed with signage
2. Two passenger emergency intercoms per car, with camera coverage
3. Interior/exterior destination signage and general information video signage
4. Digital video surveillance system: passenger area, cab, exterior
5. Wi-Fi provisions
6. Review pending ADA requirements for speech-to-text conversion

Q. Automatic Train Control

Latest generation, compatible with MARTA's existing ATC system

R. Fault Indication and Monitoring System

System consisting of operator's displays, interfaces with all on-board systems, network data system to manage, monitor, and troubleshoot on-board systems throughout the train consists. System shall be compatible with MARTA's existing train to wayside infrastructure system, and consistent with MARTA's recently installed Train Control System upgrades.

S. Interface Study

Carbuilder to perform interface study to be sure their design properly interfaces with existing MARTA infrastructure, such as station platforms, traction power system, track, rail control center, security, maintenance facilities, train control system, EMI/EMC, automatic train operation, performance requirements, train announcements, station stop berthing, and routes.

T. Testing

Extensive test program, typical of a new rail car program will be required, including proof-of-design component level and car qualification tests, life tests, structural fatigue tests, EMI/EMC testing, ride quality, noise/vibration, production conformance/acceptance tests, and analysis. Prior test reports for identical equipment can be submitted for advance approval.

U. Training, Manuals, Special Tools and Test Equipment, Spare Parts

Typical training, manuals, special tools and test equipment, and spare parts will be required. Electronic manuals will require large screen displays in the shop for ease of readability.

V. Winterization

1. Heated coupler heads
2. Pneumatic system driers
3. Heated door thresholds
4. Heated drain valves

W. Disposal of Existing Cars

Dispose of up to 336 CQ310, CQ311, and CQ312 cars. The CQ310 cars contain asbestos.

X. Reliability, Maintainability, Safety, Human Factors

Typical RMSH requirements, including car-level and component level reliability requirements. MARTA is seeking 160,000 miles between service failures.