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To: Board of Directors

From: Arthur J. Kimball
Executive Officer, Procurement

Subject: Status Report and Implementation Plan for the Procurement of Buses with Advanced Technology Transit Bus (ATTB) Design

Background

In response to Director Yvonne Brathwaite Burke's motion at the February 26, 1998 Board Meeting, staff has prepared this report on the status and implementation plan for procuring Advanced Technology Transit Buses (ATTB).

The Los Angeles County Metropolitan Transportation Authority (MTA), the Federal Transit Administration (FTA) and the Northrop Grumman Corporation (NGC) have partnered together to develop a revolutionary new transit bus.

The ATTB program was initiated in 1992 to develop a lightweight, low floor, low-emission transit bus using proven, advanced technologies developed in aerospace industries. This vehicle is being designed to meet federal, state and local axle weight and clean air requirements. It will meet or exceed Americans with Disabilities Act (ADA) requirements through the use of a low, flat floor and a simple ramp access system that is more reliable than current wheelchair lift technology. The initial generation of ATTB buses will use CNG engines which drive electric generating systems; later generations of ATTB buses may incorporate hybrid fuel cells to power their propulsion systems.

The ATTB program is a national program with bipartisan support in Congress and is endorsed by the FTA. A Rapid Transit Review Board (RTRB), consisting of the nation's largest municipal transit systems, is participating in the program to ensure the design and performance of the prototype vehicles meet national requirements.

ATTB Program Objectives

The ATTB program was initiated with the objective of developing, manufacturing and field testing a heavy duty, urban environment transit bus. The final program

goal was to design, test and manufacture a production ready configuration, a transit bus for both domestic and international markets. The full funding grant agreement with the FTA, and MTA's contract with NGC, identified design objectives for the final production bus including the following seven goals: 1) Maximum production unit price of $300,000 (in 1992 dollars) with an estimated annual production rate of 2500 buses; 2) Meet Environmental Protection Agency (EPA) and California Air Resources Board (CARB), Low-Emissions requirements for urban transit buses; 3) Meet Americans with Disabilities Act (ADA) requirement for boarding and alighting a bus; 4) A 30% overall vehicle weight reduction (approximately 10,000 lbs.) when compared to current buses of similar configuration; 5) 40-foot bus with 43 seated and 29 standing passenger capacity; 6) Operator friendly; and 7) Low operating and maintenance cost.

Attachment A is the Overall Project Funding Summary.

Current Project Status

The MTA's contract with NGC has four major elements: Conceptual Design, Technology Validation, Prototype Development, and Prototype Field Testing. NGC has completed the first three elements (Conceptual Design, Technology Validation, and Prototype Development) and the final element (Prototype Field Testing) is currently under way. The contract calls for Prototype Field Testing to be completed by December of this year. The final project report and all deliverables are due to the MTA by March 1999.

The prototype development phase calls for six (6) prototype buses to be built. The first three prototype buses (the first of which was completed in September 1996) are in the field testing phase at this time. The field tests for prototypes one, two, and three are conducted in various parts of the country including Arizona, the federal test facility in Altoona, Pennsylvania; Denver, Boston, Houston, Seattle, San Francisco and Washington D.C.

Prototype number one completed testing at Failure Analysis Associates (FAA) outside of Phoenix, Arizona in May 1997. This testing was to validate performance of the bus and to perform Federal Motor Vehicle Safety Standard (FMVSS) testing.

On June 21, 1997, prototype number two was completed and shipped to Denver, Colorado for display at the annual meeting of the 'Group of Eight Industrialized Nations.' In October 1997, it was sent to the federal test facility in Altoona, Pennsylvania, where all federally financed transit buses are required to pass a stringent durability test. The durability testing is ongoing.

Prototype number three began a national tour in March 1998. It is scheduled to go to Boston, New York, Washington D.C., Houston, Seattle, and San Francisco. These cities were selected to test how the ATTB will perform in differing climatic operating conditions. As of this date, MTA has not received vehicle performance reports from the various cities.

MTA Field Testing

The MTA received prototype number four in March, with prototypes five and six due later this month. The MTA field test phase, is scheduled to start in May, and will be completed in December 1998. At the present time, prototype number four is experiencing stalling (loss of power) problems and inconsistent vehicle acceleration. Problems such as these are not unusual in prototype development vehicles, and we anticipate that the problems will be corrected as the field tests continue, and will be resolved in the final production buses.

The buses will be tested on MTA routes in Los Angeles later this summer, and tests will continue through December 1998. Public rides will not commence until the ATTB has completed 1000 miles without a failure in simulated service.

Ownership of all six prototype vehicles and support equipment will vest with MTA at the completion of the program. However, during the field test phase, the vehicles are owned by NGC until all testing has been completed. This arrangement makes NGC responsible and liable during this phase.

Project Property Rights

The MTA owns all rights to the ATTB, including drawings, designs, and integrated systems vital to the operation of the vehicle. The major exception to this rule is that NGC owns the manufacturing process that is used to fabricate the lightweight composite vehicle body structure.

As part of MTA's grant agreement with the FTA, the FTA retained a royalty-free, non-exclusive and irrevocable license to reproduce, publish and use, and authorize others to use, the data developed under the project. The FTA, in cooperation with the MTA, has established a system of granting licenses, and is currently making restricted licenses available to interested domestic businesses. Although the grant agreement does not explicitly cover foreign manufacture of ATTBs, FTA has agreed with MTA that MTA may charge and receive a royalty on any license to manufacture ATTBs outside of the United States. FTA has accepted MTA's form of license agreement containing the royalty provision.

Future Developments

The NGC has obtained a grant from the South Coast Air Quality Management District (SCAQMD) to test ultra-capacitors on an ATTB. Later this year, prototype number one will have ultra-capacitors installed on the bus and integrated into the electrical system. The ultra-capacitors are expected to absorb energy during the braking period and release this energy during vehicle acceleration, similar to existing hybrid buses using batteries. In theory, the ultra-capacitors should be lighter in weight and absorb and release energy faster than a typical battery. It is anticipated that the ultra-capacitors will improve the performance of the ATTB. However, this is a new technology and will take considerable research and development.

Boston has initiated an industry review of a technical specification for a dual powered (external and internal propulsion power systems) hybrid vehicle, with many similarities to the ATTB. In addition, Houston continues work on an alternative energy storage device (flywheel) for later adoption into one of the ATTB prototype vehicles.

When the MTA initiates a procurement for ATTB buses, staff will evaluate the potential of establishing either a local or national Joint Powers Agreement (JPA) to broaden the market potential for this bus. Current plans call the MTA to procure a total of 500 ATTB buses over a five year contract, with delivery commencing after July 2001.

Staff will periodically update the Board regarding the status of the ATTB project and vehicle performance tests. Satisfactory vehicle performance is a prerequisite to continuing the procurement process for the initial production of ATTB buses as outlined in Attachment B.

Attachments: A. Project Budget and Funding Summary
B. Proposed ATTB Implementation Plan

Prepared by: Richard Hunt

LOS ANGELES COUNTY METROPOLITAN TRANSPORTATION AUTHORITY
ADVANCED TECHNOLOGY TRANSIT BUS PROJECT
PROJECT BUDGET BY FISCAL YEAR

Attachment A

MTA Fiscal Year	Annual Budget	Federal Funds	Federal Share	Local Match	Local Share	Local Sources of Funds			
						Prop C 40%	Prop A	DA Article	In-Kind
FY 1993	$ 4,999,611	$ 3,999,689	80%	$ 999,922	20%	$ 798,050			$ 201,872
FY 1994	7,500,000	6,000,000	80%	$ 1,500,000	20%		1,000,000		500,000
FY 1995	8,000,000	6,400,000	80%	1,600,000	20%			1,600,000	
FY 1996	7,960,000	5,000,000	63%	2,960,000	37%			2,960,000	
FY 1997	12,863,200	9,673,000	75%	3,190,200	25%	3,190,200			
FY 1998	10,000,000	10,000,000	100%	-	0%				
TOTALS	$ 51,322,811	$ 41,072,689		$ 10,250,122		$ 3,988,250	$ 1,000,000	$ 4,560,000	$ 701,872

PROPOSED ATTB IMPLEMENTATION PLAN

The acquisition plan, which is contained in the following table, shows the major tasks and time schedule. This plan is based upon the purchase of 500 ATTB design Buses over a five (5) year period at the rate of 100 Buses per year and is consistent with the MTA's Bus Procurement Plan. The acquisition plan includes functional specifications which describe the function that a product must perform and/or a goal which the product must attain.

Key Dates	Major Milestones
April, 1998	Develop preliminary draft performance specification / technical scope of work - **Completed**
May, 1998	Receive Road Test Data from other Cities
June, 1998	Issue Draft Technical specifications to the transit industry for review and comment
July, 1998	Incorporate industry comments and test data in draft specifications and prepare final specifications
	Issue Notice of Availability of Specifications
	Advertise IFB in Passenger Transport and other appropriate media
August, 1998	Hold Pre-Bid Conference and Workshop
December, 1998	Receive and Open Bids
February, 1999	Present Award Recommendation to MTA Board of Directors
March, 1999	Receive Final Report and All Deliverables from NGC
	Issue and Execute Contract
April, 2000 or sooner	Successful Bidder manufactures 3 Production Vehicles and completes FTA mandated Altoona testing
	Successful Bidder provides Altoona test results to MTA
July, 2000 or sooner	MTA issues Notice to Proceed authorizing Pre-Production Vehicles
July, 2001 or sooner	Receive and approve Pre-Production Vehicles
	Issue Notice to Proceed for Full Production