



OPERATIONS COMMITTEE  
FEBRUARY 20, 2002

Metropolitan  
Transportation  
Authority

One Gateway Plaza  
Los Angeles, CA  
90012-2952

**SUBJECT: UNIVERSAL FARE SYSTEM (UFS)**

**ACTION: AWARD CONTRACT TO CUBIC TRANSPORTATION SYSTEMS, INC.**

**RECOMMENDATION**

- A. Award a five year, firm fixed price contract number OP-02-4610010 to Cubic Transportation System, Inc. for a Universal Fare System in the amount of \$84,003,444, effective March 1, 2002
- B. Authorize the Chief Executive Officer to execute change orders for this procurement only, in an amount not to exceed \$5,000,000 for a total contract value not to exceed \$89,003,444.

**RATIONALE**

MTA's "customer first" focus requires designing a convenient, seamless countywide fare collection system to serve our public transit customers. In support of this initiative staff will soon implement a countywide "Regional Pass" in first quarter FY03. This paper flash pass will become the county's first "universal" fare media enabling the region's customers to seamlessly travel on any transit system or on any operator without worry of differing fare structures and media. This initial step serves as the cornerstone to the Universal Fare System (UFS).

The current procurement of new fare collection equipment will greatly enhance the capabilities of seamless travel for transit riders in our communities. New automated fare collection equipment permits MTA to replace MTA's current system that has reached the end of its life cycle. Automated equipment using smart card technology will feature bus fare boxes, rail ticket vending machines (TVMs), validators, a central data collection system and other related equipment with the capability to record and validate rides, store value, debit credit cards, accept cash and provide other multi-application benefits to the customer. The UFS can be used across all modes of transit among the county's service providers, including the region's municipal and local bus operators; commuter rail operator, Metrolink; and the ADA paratransit operator, Access Services. The UFS equipment also comes with a full complement of sales office terminals to be installed into the region's 900-plus sales distribution network, enabling convenient customer access to purchase and reload smart cards.

This automated fare collection system will improve data collection and reporting for the MTA through a new central data collection system. Revenue and ridership information will be readily available providing timely, accurate information retrieval and expanded financial control and service planning.

UFS equipment will also be available to the regional service providers through their exercise of procurement options in the MTA contract. Full integration of this UFS system will be accomplished as regional operators procure and install compatible equipment either from their acquisition of new, fully integrated fare boxes or UFS compatible "stand beside" equipment. Once MTA has awarded its contract, municipal and local operators can precisely identify equipment price and installation schedules to exercise a variety of options to best suit their needs for UFS system compatibility

Booz-Allen & Hamilton previously prepared the UFS technical specifications and is responsible for providing project implementation services for the design, testing, installation, and contract close-out phases of this multi-year fare collection project. Booz-Allen performs in this capacity at other peer agencies and entities such as WMATA, Seattle Sound Transit, San Francisco Translink, Denver RTD, New York PATH and Sydney, Australia.

The first milestone on the UFS project's critical path is the installation of TVMs for the Pasadena Gold Line by their anticipated revenue operation date of July 2003. This will provide for limited mode operation, comparable to MTA's current TVMs. Concurrently, bus fare boxes and final TVM software will be in design stages for a period of approximately fourteen months, followed by pilot testing and installation. It is anticipated that following contract award, the system will take approximately twenty-nine months to be fully designed, tested, installed and put into revenue operation at MTA. Other operators may be implementing compatible equipment concurrently – options allow additional time (up to four years) for other operators to order equipment from the contract.

While the UFS fare collection project proceeds, the MTA will separately procure a regional financial clearinghouse system. The clearinghouse will clear and reconcile financial transactions between the region's participating transit operators. In August 2001, the MTA Board selected the smart card as the preferred technology option for the UFS system. The UFS regional committee currently is exploring the various smart card-specific vehicles now available in the industry to clear funds regionally once UFS is fully implemented. Presently, a working group representing various operators has been meeting to discuss fare technology policies and work rules. In March 2002, MTA and its partners will hold a regional workshop to discuss the various aspects of administering a countywide common fare system utilizing the new automated fare collection technology.

## **FINANCIAL IMPACT**

The cost of MTA's UFS system is approximately \$89,000,000. Funding of \$76,303,000 is included in the FY02 Capital Projects budget in cost center 4610, Transit Planning under Project #200225, Universal Fare System (UFS). An additional \$1 million is required for the Pasadena

Gold Line betterments. Approval of this action will increase the project authorization to a new total of \$89,000,000. \$500,000 has been expended in FY02; and an aggregate \$4.9 million has been expended to date. Approximately 70% of the capital project budget is federally funded; the balance of 30% is state and locally funded.

Since this is a multi-year contract, the cost center manager and Executive Officer will be accountable for budgeting the cost of maintenance in their annual operating budget in future years, including any option exercised.

Funding for the municipal and local operators will be addressed when their equipment needs are specifically identified. \$15 million in 2002 STIP funds previously programmed to municipal and local service providers for UFS equipment will be exchanged for an equal amount of funds programmed to MTA's UFS budget. This exchange permits MTA to submit a single consolidated request to the State to immediately obtain the STIP funds and further relieves each individual municipal and local operator to separately submit single requests to the California Transportation Commission. This action permits the other transit operators to use a more flexible source of funding such as CMAQ, the most likely source for the exchange, eliminating the various administrative requirements associated with STIP funds. Finally, this exchange also gives the other municipal and local operators more time to develop their fare collection needs, since STIP funds must be used within a prescribed period, whereas CMAQ funds may be used over a longer period of time.

### **ALTERNATIVES CONSIDERED**

As an alternative, MTA could procure a combination system of magnetic and smart card technology. However, this approach results in a more expensive system and is contrary to the recent Board decision for the cash plus smart card as the regional fare media.

Another alternative would be to split the procurement, one for bus fare boxes, and another for rail ticket vending machines. However, this would be contrary to the Board's action to combine the procurement in order to reduce risk to the MTA by procuring an integrated system with a single point of responsibility.

The last option considered would be to maintain the current system, an alternative that would be contrary to the Board's direction to implement a regional, countywide fare collection system for our customers.

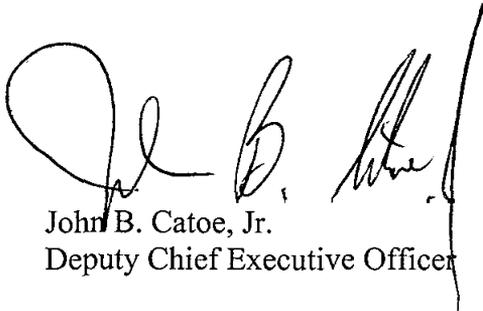
### **NEXT STEPS**

Staff will provide quarterly progress reports that will include key milestones achieved and delays to the project's critical path.

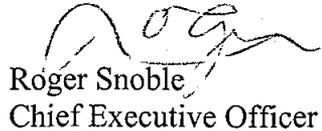
## ATTACHMENTS

- A Procurement Summary
- A-1 Procurement History
- A-2 Procurement List of Subcontractors
- B Itemized List of Equipment for Base Contract

Prepared by: Jane Matsumoto  
Project Manager, Universal Fare System



John B. Catoe, Jr.  
Deputy Chief Executive Officer



Roger Snoble  
Chief Executive Officer

**BOARD REPORT ATTACHMENT A  
PROCUREMENT SUMMARY**

**UNIVERSAL FARE SYSTEM**

1.	Contract Number: OP-02-4610-08		
2.	Recommended Vendor: Cubic Transportation Systems, Inc.		
3.	Cost/Price Analysis Information:		
	A. Bid/Proposed Price: \$85,115,725	Recommended Price: \$84,003,444	
	B. Details of Significant Variances are in Attachment A-1.D		
4.	Contract Type: Firm Fixed Price		
5.	Procurement Dates:		
	A. Issued: May 31, 2000		
	B. Advertised: June 1-8, 2000		
	C. Pre-proposal Conference: June 15, 2000, December 19, 2000		
	D. Proposals Due: July 5, 2001		
	E. Pre-Qualification Completed: August 31, 2001		
	F. Conflict of Interest Form Submitted to Ethics: July 20, 2001		
6.	Small Business Participation:		
	A. Bid/Proposal Goal: 3% DBE Goal	Date Small Business Evaluation Completed: January 31, 2002	
	A. Small Business Commitment: 5.65% Details are in Attachment A-2		
4.	Invitation for Bid/Request for Proposal Data:		
	Notifications Sent: 716	Bids/Proposals Picked up: 80	Bids/Proposals Received: 2
5.	Evaluation Information:		
	A. <u>Bidders/Proposers Names:</u> Cubic Transportation Systems Scheidt & Bachmann	<u>Bid/Proposal Amount:</u> \$85,115,725 \$141,601,047	<u>BAFO Amount:</u> \$84,003,444 No Bid
	B. Evaluation Methodology: Weighted Guidelines Details are in Attachment A-1.C		
6.	Protest Information:		
	A. Protest Period End Date: March 2, 2002		
	B. Protest Receipt Date: N/A		
	C. Disposition of Protest Date: N/A		
7.	Contract Administrator: Donald C. Dwyer	Telephone Number: 922-6387	
8.	Project Manager: Jane Matsumoto	Telephone Number: 922-3045	

**BOARD REPORT ATTACHMENT A-1  
PROCUREMENT HISTORY**

**UNIVERSAL FARE SYSTEM**

A. Background on Contractor

Cubic Transportation Systems, Inc., a wholly owned subsidiary of Cubic Corporation, is located in San Diego, California. Cubic Transportation Systems, Inc. (Cubic) has been in business since 1949. Cubic specializes in two areas of business: Defense and Transportation. Cubic is currently under contract with the MTA to perform maintenance on bus fare boxes. All the fare boxes currently used by the MTA were provided by Cubic in the early 1990's. Cubic's performance under these contracts has been satisfactory. Cubic has provided fare collection equipment to transit agencies throughout the United States and the World including New York City Transit, Chicago Transit Authority, Washington Metropolitan Area and London Underground Limited.

B. Procurement Background

On May 31, 2000, a Request for Proposal was issued soliciting proposals for the replacement of the MTA's fare collection system. In accordance with PUC 130238, the MTA Board authorized by a 2/3 vote (April 2000 Board) a competitive negotiation methodology that allows price and other factors to be considered in the selection of a contractor. By separate Board action (August 2001), the MTA Board determined that the fare collection system would feature the "smart card" as the regional fare media.

The solicitation period began on May 31, 2000 and completed with the submittal of proposals on July 5, 2001. During the solicitation period, the proposal due date was extended due to the redrafting of the technical specification to incorporate a smart card only option, the review of the solicitation documents by the law firm of Foley and Lardner and because of several requests by proposers to extend the due date because of the complexity of the system. Scheidt and Bachmann and Cubic Transportation Systems submitted proposals.

The UFS source selection committee convened to review the proposals on July 9, 2001. Proposal presentations were held during August 20-24, 2001 and scoring of the initial proposals was completed by August 31, 2001. The request for Best and Final Offer (BAFO) was issued on December 20, 2001. On January 24, 2002, a single BAFO proposal was received from Cubic.

On January 3, 2002 and January 7, 2002, letters were received from Scheidt & Bachmann requesting various changes to the BAFO documents as a condition for the submittal of a Best and Final Offer. These changes included a further extension of the BAFO due date, the extension of the overall Contract schedule by approximately one year, an eight percent overall limitation of Contract liability and a reduction in the performance and payment bond amounts. After discussion with the Office of the Chief Executive Officer, Scheidt & Bachmann's request was denied. Scheidt & Bachmann declined to submit a Best and Final Offer.

A. Evaluation of Proposals

The Source Selection Committee was comprised of scorers from both within and outside the MTA. Four individuals represented the MTA, one each from Construction, Revenue, Information Technology and Operations. Two individuals, one from Santa Monica and one from Foothill, represented the region's Municipal Operators. In addition, two consultants were included on the Source Selection Committee to add outside, technical expertise.

Proposals were reviewed in accordance with the MTA's Procurement Policies and Procedures and the approved Source Selection Plan. The Source Selection Committee conducted a comprehensive evaluation of both the technical merits and qualifications of each proposer. Both proposers participated in presentations before the Source Selection Committee to discuss and clarify their respective technical approaches. Reference checks were performed and found to be satisfactory. On November 26-30, 2001 and December 3-7, 2001, negotiations were held. Upon conclusion of the negotiations, the committee members completed an initial scoring of the proposals. Based upon the Committee's initial scoring, Cubic's proposal received the highest score.

On December 20, 2001, a Request for Best and Final Offer was issued to both proposers. On January 24, 2002, a single proposal was received from Cubic. On January 28, 2002, the Source Selection Committee reconvened to review the proposal and finalize the scoring. No adjustments to the initial scoring were made.

#### D. Cost/Price Analysis Explanation of Variances

The recommended price has been determined to be fair and reasonable based upon adequate price competition. Cubic's Best and Final Offer was submitted based on the presumption of competition and price analysis (including market analysis) was conducted as provided for under the MTA Procurement Policies and Procedures (1514.d.b).

**BOARD REPORT ATTACHMENT A-2  
LIST OF SUBCONTRACTORS**

**UNIVERSAL FARE SYSTEM**

**PRIME CONTRACTOR – Cubic Transportation Systems, Inc.**

Small Business Commitment

American Alloy Fabrication	0.25
Lows Enterprises, Inc.	0.13
Priority Mfg. Inc.	0.93
Robnett Electrical	2.53
TechProse	0.40
J-Tec Metal Products	0.13
KLI, Inc.	0.25
Kormex	1.02
Total Commitment	<hr/> 5.65%

Other Subcontractors

GFI Genfare  
Mercury EMS  
AllBright Technologies, Inc.  
ICS Advent  
Mars Electronics

ATTACHMENT B  
UFS List of Equipment for Base Contract

**Base Contract**

The following items are in the base contract.

- 266 Ticket Vending Machines for sale of fare media.
  - General Characteristics:
    - Ergonomic external design
    - Designed to withstand vandalism, prevent minimum entry of liquids while providing maximum ease of use for entry of coins and bills.
    - Exterior light/light system
    - Expandability, using open ports or circuit card slots for future capability to process other payment media
  - Security
    - Strengthened cabinet
    - Audible intrusion and vibration alarms
    - Maintain and print a record of alarms
    - Alarms reported to the Central Data Collection System (CDCS) and Rail Operations Center (ROC) as they occur
    - High Security locking mechanism.
    - Separate secure vaults to contain coins and bills
  - Customer Interface
    - Contactless smart cards shall serve as the primary fare media. Low value tickets such as single or round trip or single-trip transfers shall be printed on paper or polyester ticket stock.
    - System shall be designed to accommodate different ticket stocks or low-value contactless smart cards in place of polyester or paper stocks as delivered.
    - Menu driven touch screen with customer information
    - Comply with requirements of the Americans with Disabilities Act.
    - Multiple languages
    - Customer input process using focus groups for interface design.
  - Ticketing
    - Ability to handle multiple ridership categories
    - Multiple ticket stocks
    - Means of easily changing ticket print format and generating additional ticket types as required, through the Central Data Collection System
    - Ticket and receipt printing using thermal printing
    - Provide fare validation functions for electronic media, similar to those of the SAV
    - Self-unjamming
    - Payment Processing
      - Accept US coins and currency in common circulation
      - Accept smart cards, tokens, credit cards and debit cards

- Recirculation of coins for use as change
- Continuous monitoring of ticket stock, coins and bills
- Bills escrowed pending completion of transactions. (Optional coin escrow)
- Credit/ATM (Debit) Bank Card System
  - Capable of processing credit and debit card transactions, in accordance with prevailing banking regulations.
  - System to be provided shall include interface capabilities for regional transaction processing and allowing other transaction processing services to be added or substituted at a later date.
  - Minimizing fraud by comparing credit and debit card numbers against internal bad-card lists, updated regularly.
  - Checking sales against editable parameters
  - Routing transactions to the clearing house, checking customer PIN (debit card payments only), obtaining authorization and transmitting the authorization to TVMs.
  - Providing Settlement data to LACMTA and the clearinghouse.
- Contact Smart Card Reader
  - EMV compliant
  - Read identification and security data from and remove and load to or remove value from epurse on contact-type smart card.
  - Capability to provide LACMTA personnel access authorization via a smart card for revenue servicing and maintenance.
- Reporting
  - Report all transactions in batch mode via Data Transmission System
  - Fully transactional database
  - Alarms and credit/debit card transactions reported in real time
- Bus Fare Collection System, consisting of the following:
  - 2,711 Electronic Validating Fareboxes, each furnished with
    - Driver control module
    - Currency (coins and bills) recognition
    - Smart card processor
    - Interface to ATMS
    - Read-only Card Readers
    - Installation
  - Revenue Collection System, including:
    - Revenue collection vaults (RCV) – four for each garage.
    - 100 Mobile collection bins (MCB)
- 300 Stand Alone Validators (SAV)
  - SAVs provide the following functionality:
    - Validate smart cards by deducting the designated fare amount and encoding the new value, with appropriate identifying information including date, time, location and unit identification number.
    - Record all validations and transmit all data transactions and event data to the CDCS.

Be suitable for mounting on its own pedestal or on walls or support columns.

Customer interface complying with ADA requirements.

- 200 Handheld Card Validators (HHV)
  - Handheld device for fare enforcement personnel to use to check smart cards, including keypad, display, audio indicators, card interface, printer and power supply
  - Base stations and communications to CDCS
- Division Computer Network
  - Computers located at each division to provide a means of polling fareboxes, storing data, transmitting data to the CDCS, receiving operating parameters from the CDCS and transmitting operating parameters to the fareboxes and other bus System Components.
  - Portable Data Probes
  - Interface to LACMTA's LAN/WAN (at LACMTA divisions)
  - Communicate to CDCS
  - Communicate to on-board System Component (farebox and other Bus System Components) via infrared probe and through UFS RF LAN.
  - Associated software and reporting subsystems.
- 955 Sales Office Terminals (SOTs) to permit sales agents to:
  - Two types – Limited function (855) to be placed in concession sales locations. Full function for MTA sales offices and locations where smart card “personalization” will be done
  - Sell Contactless Smart Cards (CSCs)
  - Load value onto CSCs
  - Check the existing value of a CSC
  - Print transaction receipts
  - Store and transmit transaction data to the CDCS.
- Central Data Collection System
  - Provide transaction control, daily farebox, TVM, SAV and SOT polling, event and machine status reporting
  - Data repository for all event and transaction data
  - Control of operating parameters
  - Producing specified reports
  - Report writer for ad hoc reporting
  - Monitoring and control of the fare collection System communications network.
  - Downloading of “negative list” of bad ticket numbers
  - Communication and logging of fare collection System alarms
  - Communication hub between TVMs and SOTs and credit card clearinghouse
  - Communication hub between field fare collection System Components and any external computing system used to facilitate regional revenue clearing activities
  - Have a fully relational database, allowing the generation of reports other than those that are provided preformatted, as part of the System.

- Contactless Smart Card System
  - All field items such as fareboxes, TVMs, etc., shall contain contactless smart card readers to process CSCs.
  - Load value onto a smart card (Farebox, TVM and Sales Office Terminal only)
  - Vend new smart card (TVM only)
  - Pay for the current transaction using value resident in the e purse
  - Capable of processing stored ride tickets, stored value tickets, passes, rolling period passes, transfers, POP validation and other documents encoded on smart cards as required by LACMTA.
  - Transfer value from old smart cards (TVM, SOT, BSU and farebox)
  - Provide validation for transfers, POP tickets, and stored ride tickets (excluding SOTs)
  - Primary interfacing device of the Universal Fare System.
  - Read and display remaining balance of the smart card.
  - Re-encode information to the smart card.
  - Obtaining access authorization for the opening of the TVM maintenance door.
  - Support multiple contactless smart card standards
  - Initial supply of smart cards
- Rail maintenance contract (3 yrs, 10 months)
- Passenger, driver, and maintenance training
- Computer based training program
- Bar code scanner and software
- System installation
- Quality assurance, inspection and testing
- Product support
  - Manuals
  - Spare parts
  - Training
  - Diagnostic and test System Components

## **Options**

In addition, the following optional System Components and/or Work shall be available for exercise by LACMTA. Contractor will maintain base price for these additional quantities of System Components for a minimum of four years after Contract execution, subject to an agreed price escalation index.

- Additional units (Fareboxes, TVMs, SAVs, CLVMs, HHVs and both configurations of SOTs, plus installation and support), which may be procured through contracts with LACMTA or with other UFS participating agencies. Proposers are to propose unit prices for lots as identified in the cost proposal forms.
- Card Loading and Validating Machines (CLVM) for loading value to cards at MetroLink stations, Bus Rapid Transit stops and other locations where compact, low cost sales capability is required. CLVM may have capability to accept dollar bills.
- Bus Smart Card Processor System (BSU)

- "Stand beside" device to process smart cards on vehicles that do not have a farebox or have a farebox that is not compatible with UFS.
- Provide reports at the operating location with a Division Computer.
- Communicate to Data System or to a clearinghouse computer to be provided in the future.
- Additional smart cards.
- High Speed smart card Encoder.
- Rail AFC System Components maintenance program, additional three years.
- Extended warranty.
- Magnetic ticket processor unit (TPU), can be purchased with equipment or as retrofit as desired by specific agencies.

41

**Staff recommendation for contract award  
UNIVERSAL FARE SYSTEM**

**Operations Committee  
FEBRUARY 20, 2002**

**John B. Catoe, Jr.  
Deputy Chief Executive Officer  
UFS Project Sponsor**



# **Cubic Transportation Systems, Inc. has been selected to be the supplier of the region's Universal Fare System**

- **Cubic Transportation Systems, Inc. (CUBIC) is the prime contractor**
- **GFI Genfare is the sub-contractor for the construction of the bus fare boxes.**
- **These two suppliers have provided nearly all of the fare collection systems in the United States.**
- **In addition, they have installed fare equipment in Sydney, Australia; London, England; and in China, to name a few.**

**The objective of the Universal Fare System is to support the  
“CUSTOMER FIRST” ...**

**The equipment that MTA will purchase from Cubic  
Transportation Systems, Inc. will:**

- **Assist passengers to travel “seamlessly” across all modes of transit, on any service provider in the region**
- **Eliminate customers’ confusion over differing fare structures and media among regional operators**
- **Help reduce our riders’ threats to theft caused from carrying cash**

**The UFS can also provide many additional benefits for our customers in the future**

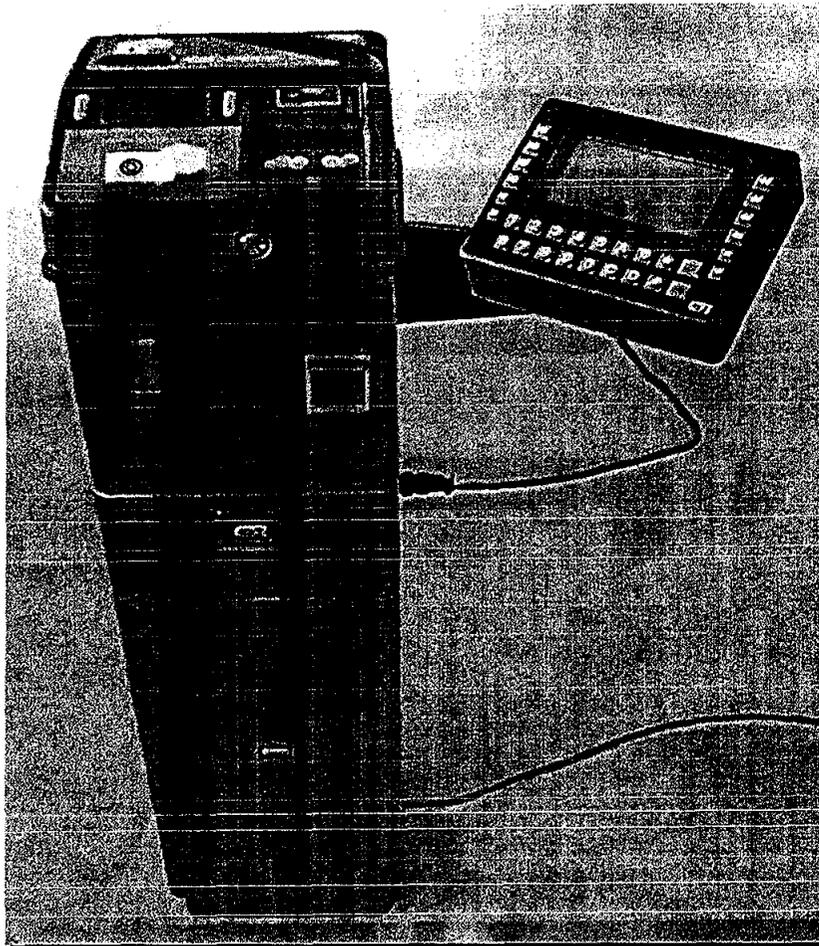
**Potentially, customers will have the opportunity to use one “universal” smart card for multiple applications:**

- **Loading corporate-sponsored transit subsidies on the UFS smart card**
- **Purchasing goods and services from potential retailers and parking lots**
- **Expanding the usage to include banking institutions in the future**

**This procurement includes provisions for other transit and public organizations to participate as “media partners”**

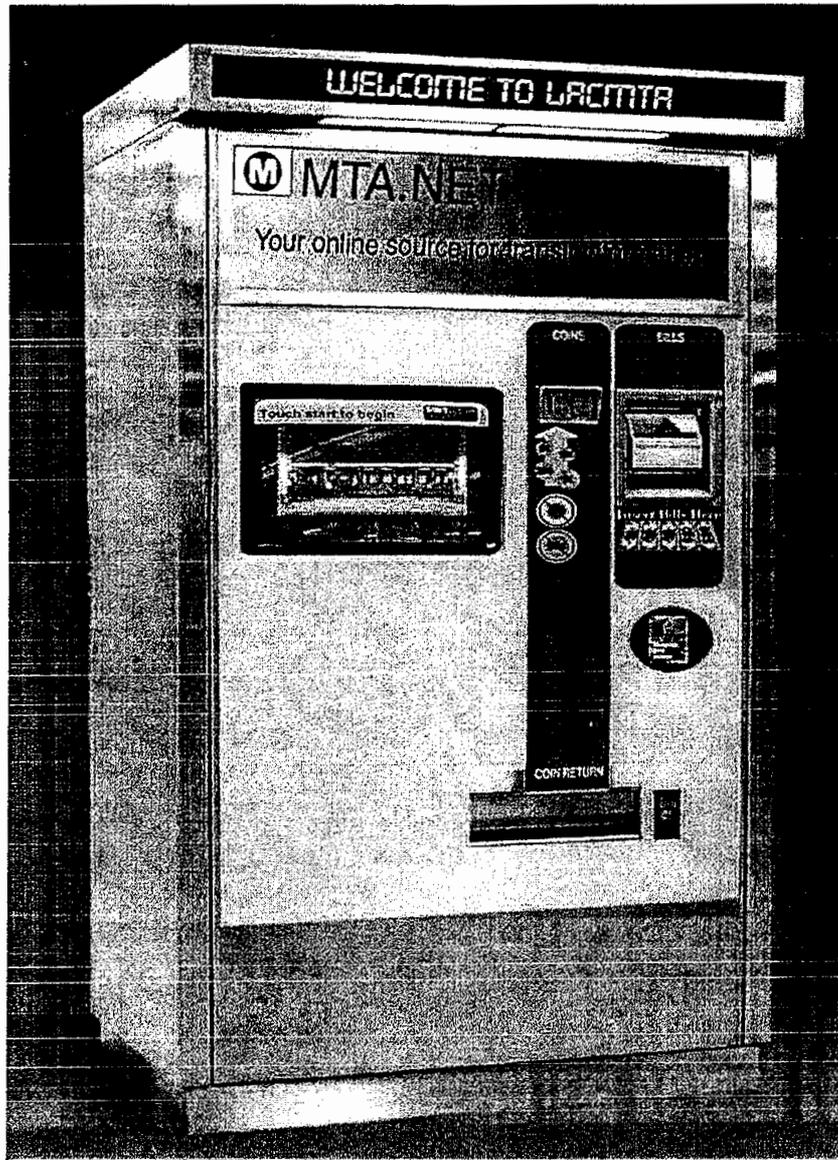
- **The contract document will permit other external entities to participate in the MTA’s licensing agreement and provide compatible systems.**
- **The system design process can include input from many sources of interest.**
- **Municipal and Local Operators, Metrolink, etc. have purchasing “options” to exercise from this procurement.**

Here is a preview of some up-coming equipment...



## GFI Genfare Odyssey Bus Fare Box

# CUBIC Rail Ticket Vending Machine



# CUBIC Smart Card Validator

