PART 1 – GENERAL

1.01 SECTION INCLUDES
A. Addfare Machines (AFM)

1.02 RELATED SECTIONS
A. 34 50 10 Fare Collection System
B. 34 50 11 Fare Collection Equipment Installation
C. 34 50 13 Ticket Vending Machines
D. 34 50 16 Fare Gates

1.03 MEASUREMENT AND PAYMENT
A. Measurement: Addfare machines will be measured for payment as a lump sum unit acceptably installed and tested for compliance.
B. Payment: Addfare machines will be paid for at the Contract lump sum price for addfare machines or as part of the lump sum price for Fare Collection System Work, as determined by the lump sum measurement specified above, as indicated in the Bid Schedule of the Bid Form.

1.04 REFERENCES
A. Payment Card Industry (PCI) Security Standards Council
   1. Pin Transaction Security (PTS) Point of Interaction (POI)
   2. Point-to Point Encryption (P2PE) Solution Requirements and Testing Procedures
B. EMVCo (Europay, MasterCard and Visa) Specifications
   1. Integrated Chip Card to Terminal Interface
   2. Security and Key Management
   3. Application
C. Americans with Disabilities Act (ADA):
   1. Americans with Disabilities (ADAAG)
D. California Code of Regulations (CCR):
   1. CCR, Title 24 California Building Code
E. San Francisco Bay Area Metropolitan Transportation Commission (MTC):
   1. Clipper® Card Specification

1.05 SUBMITTALS
A. Refer to Section 34 50 10, Fare Collection System, for submittal requirements.

PART 2 – PRODUCTS

2.01 GENERAL
A. Functionality: The AFM shall perform the following functions:
   1. Upgrade an undervalued BART Blue ticket to the minimum fare required to exit the station, using cash;
   2. Reload Clipper® Card fare media up to the minimum fare required to exit the station using cash;
   3. Allow the customer to select the amount to load on an existing fare media.
   4. Pay for parking by entering a stall number for validation, using either magnetic ticket store value or cash, credit or debit card).
   5. Accept credit and debit cards with either magnetic stripe, EMV (Europay Mastercard Visa) compliant chips, contactless payment card, or mobile device;
   6. Accept one and five dollar bills, nickels, dimes, quarters, dollar coins, and optionally ten and twenty dollar bills;
   7. Return nickels, dimes, quarters, dollar coins and optionally bills for change on cash transactions;
   8. Provide change up to $4.95. The quantity of change dispensed shall be programmable locally in the service keypad or remotely from EME;
   9. Make change without purchase for one $1.00 bill;
B. Design: The AFM shall be of same design, construction, software and operating features to the ticket vending machines (TVM) specified in Section 34 50 13, Ticket Vending Machines, except as modified herein.
C. Drawings: The Contract Drawings depict examples of front panel features and equipment dimensions. The examples are provided to the Supplier as the basis for developing its design and shall not be construed to be complete. The Supplier shall
be responsible for the design of the AFM and their compliance to the requirements specified herein.

2.02 COMPATIBILITY

A. Functional and physical compatibility requirements with existing AFM shall be the same as those specified for TVM’s in Section 34 50 13, Ticket Vending Machines.

2.03 CUSTOMER INTERFACE AND HUMAN FACTORS:

A. The requirements for customer interface and human factors shall be the same as for TVM as for TVM as specified in Section 34 50 13, Ticket Vending Machines.

2.04 FRONT PANEL ASSEMBLY

A. The operating features on the front panel of the AFM are indicated on the Contract Drawings. Requirements for message display unit, soft keys, out-of-service annunciator, coin bezel, coin return cup, bill bezel, bill return, ticket slot, access lock, and front panel graphics shall be the same as for the TVM as specified in Section 34 50 13, Ticket Vending Machines, except as modified herein.

B. Message Display Unit (MDU): Messages shall be adapted to the functions of the AFM.

C. Numeric Keypad: A numeric keypad is required to allow customers to enter a parking stall number for fee-based parking validation. The keypad shall also serve as the PIN entry device for debit card transactions. When used to enter the debit card PIN, the key pad shall encrypt the PIN prior to transmitting the data to the Single Board Computer. Parking stall numbers shall be transmitted unencrypted.

D. Bill Bezel: AFM shall accept $1, $5, $10 and $20 bills. The bill bezel shall be constructed of stainless steel or cast aluminum and formed with a ledge and side guides such that the customer can hold the bill down and slide it into the bill validator entry slot to minimize any tendency to skew. No gaps shall exist between the bezel and entry slot that could divert the bill into the inside of the AFM. The bezel shall be of sufficient strength to withstand minor acts of vandalism and shall be a replaceable module. The bezel shall be designed to reduce and prevent potential for fraud through tampering. Graphics, located on the bezel below the entry slot, shall illustrate the correct orientation of the bill. Graphics shall be engraved. The bezel shall not extend more than one and one-quarter inch from the surface of the front panel and shall be affixed to the bill validator and not to the front panel. Upon rejection, bills shall be returned through the bill bezel. The bills shall protrude at least two inches, and shall be held until forcibly retrieved by the customer.

E. Bill Return: Upon cancellation of a transaction, the escrowed bills shall be returned through a separate bill return slot. The bills shall protrude at least two inches, and be held until forcibly retrieved by the customer. In addition, transactions requiring change return many optionally return bills as change, returning change with the best combination of bills and coins.
F. Cancellation: The “Transaction Cancelled” message shall be displayed on the MDU conditions:

1. Coin or bill escrow capacity has been exceeded.
2. Power failed before the total amount of money required was inserted.
3. Greater than $1.00 is inserted for a “Change Only” transaction.
4. Jammed ticket.

G. Front Panel Graphics: shall be designed to be sufficiently different in appearance from the TVM to enable customers to readily identify the two types of equipment.

H. Receipt Printer. The AFM shall be equipped with a receipt printer that prints a receipt for the following scenarios:

1. Upon request, receipt for a successful credit card or debit card transaction
2. Receipt for a failed cash transaction for refund claim
3. Receipt for revenue service access
4. Receipt for parking validation transactions

I. Smart Card Reader (see Article 2.14 in Section 34 50 13, Ticket Vending Machines) for Reload: the AFM shall be equipped with a customer-facing Smart Card Reader that allows the customer to add value to an existing smart card.

2.05 TRANSACTION TIMES

A. Transaction times shall be measured based on the total time for ten consecutive identical transactions conducted by trained personnel, divided by the number of transactions.

B. Undervalued Ticket. The AFM shall complete the upgrading of a ticket undervalued by $2.40 in less than 15 seconds for the following denominations of money inserted:

1. Three one dollar bills ($0.60 in change returned).
2. Two one dollar bills, one quarter, one dime, and one nickel.
3. One five dollar bill ($2.60 in change returned).

C. Clipper® Card: Transaction time for a Clipper® Card loading shall be the same as for the TVM, as specified in Section 34 50 13, Ticket Vending Machines.
2.06 MICROPROCESSOR ASSEMBLY

A. The requirements for chip quality, data storage, and data interfaces shall be the same as those for the TVM as specified in Section 34 50 13, Ticket Vending Machines, except as modified herein.

B. Data Storage.

1. AFM shall gather the following data.
   a. Cumulative Sales Data: Each storage partition (current and previous) shall maintain a record of cumulative sales data including:
      1) Total sales revenue;
      2) Revenue from currency by denomination;
      3) Total number of change-only transactions;
      4) Number of tickets or Clipper® cards by type addfare by currency;
      5) Value and number of ticket or Clipper® card addfares by ticket type;
      6) Value and number of Clipper® Card reloads;
      7) Number of parking fee payment transactions; and
      8) Value of parking fee payment from tickets and from currency.
   b. Individual Ticket Transaction Data: Each storage partition (current and previous) shall maintain a record of each individual addfare and Clipper® Card reload transaction. For each transaction, the recorded data shall include but not limited to:
      1) AFM identification number;
      2) Station location;
      3) Date and time of transaction;
      4) Transaction number;
      5) Amount of money patron paid;
      6) Identification of change-only transaction;
      7) Value of ticket before addfare or Clipper® Card before reloaded;
      8) Value of ticket after addfare or Clipper® Card after reloaded;
      9) Value of addfare that AFM wrote to ticket or Clipper® Card;
      10) Ticket value used for parking payment;
      11) Ticket or Clipper® Card type and serial number;
      12) Currency accepted by denomination;
      13) Coins returned by denomination;
      14) Coins returned by hopper by denomination; and
      15) Parking stall number entered by the customer and validated by the AFM.
ADDFARE MACHINES

c. Equipment Summary Data: Each storage partition (current and previous) shall maintain a record of Equipment Summary Data including but not limited to:

1) Number of failure or malfunction incidents by type
2) Number of access to Bill Vault and Bill Escrow
3) Number of access to Coin Vault, Coin Hoppers, and Coin Magazines
4) Number of access to ticket roll stocks
5) Number of legitimate entries
6) Number of intrusions and manipulation entries
7) Number of bills read but not accepted
8) Number of service and warning incidents by type
9) Amount of money in each revenue service component
10) Number of accesses to ticket handling mechanism

d. Equipment Event Data: Each storage partition (current and previous) shall maintain a record of each equipment event, including details for each transaction or media validation failure. The recorded data shall include but not limited to:

1) AFM identification number
2) Station location
3) Date and time of event
4) Type of Event
5) Failure Code
6) Operator ID, Security Level (if applicable)
7) Complete financial status of component (if applicable)

2. Storage Capacity: The data storage media (RAM, Hard disk or Solid State Disk) shall be adequate to store the current and previous Cumulative Sales Data and the Equipment Summary Data for at least 30 days. For the Individual Sales Transaction Data and the Equipment Event Data, the data storage media shall have the capacity to store 10,000 transactions or three days worth of data, whichever is greater, for both the current and previous period. The data storage media shall be adequate for the storage capacity indicated plus a reserve of 300 percent of the capacity used. If RAM storage is used, expansion shall be possible with the simple addition of memory boards or chips.

C. Data Interface. The data to be transmitted shall include the following as a minimum:

1. Real Time Data: The data indicated below shall be transmitted to the DAS as soon as the events occur. The data transmission process shall be accomplished with no degradation to system performance and transaction times.

a. Event Data:
1) AFM Identification number;
2) Station location;
3) Date, Time;
4) Operator ID, Security level;
5) Door open;
6) Door close;
7) Maintenance Mode On;
8) Maintenance Mode Off;
9) Coin box 85 percent full;
10) Coin box 100 percent full;
11) Supplemental hopper 10 percent full (5-cent);
12) Supplemental hopper 10 percent full (25-cent);
13) Supplemental hopper empty (5-cent);
14) Supplemental hopper empty (25-cent);
15) Bill vault 85 percent full;
16) Bill vault 100 percent full;
17) Ticket level low;
18) AFM in secondary mode; identify mode;
19) Failure code;
20) Intrusion Alarm;
21) Manipulation Alarm;
22) Rejection bin full;
23) Coin jam;
24) Bill Jam;
25) Complete financial status of the AFM every time the AFM door is opened;
26) Indication of low-ticket supply;
27) Indication of low-receipt supply;
28) Performed function code;
29) AFM in-service/out-of-service;
30) Hopper recharged;
31) Authorized entry;
32) Loss of power;
33) Configuration parameter change;
34) Component status and failure events.
b. Individual Sales Transaction Data: The data specified in Article 2.06.B.1.b shall be transmitted.

c. Treasury Service Data:
   1) AFM ID number and location
   2) Date, Time
   3) Operator ID, Security level
   4) ID of each revenue service component removed
   5) ID of each revenue service component inserted
   6) Number and type of bills/coins in each revenue service component removed
   7) Unauthorized bill vault or coin box removal or insertion

d. Real Time Data: The data indicated below shall be transmitted to the DAS as soon as the events occur, in real time. The data transmission process shall be accomplished with no degradation to system performance and transaction times.

2. Polled Data: The AFM shall transmit the following data when polled
   b. Summary of Sales Transaction: The stored Cumulative Sales Data specified above.
   c. Ticket Transaction Data: The stored Individual Ticket Transaction Data specified above.
   d. Equipment Event Data: The stored Equipment Event Data specified above.

2.07 TICKET TRANSPORT MODULE

A. The ticket transport module shall encode the new remaining balance on the inserted magnetic stripe ticket upon completion of the add fare or parking transaction. The AFM shall not have a ticket supply, nor shall it print on the ticket.

2.08 FARE STRUCTURE

A. The AFM shall conform to the fare structure requirements specified in Section 34 50 10, Fare Collection System.

B. Parking fees shall be specified via downloadable configuration tables, and may be individually configurable for each station. Parking fees shall support time/day-based pricing.
2.09 OTHER REQUIREMENTS

A. Other requirements for the AFM shall be the same as those for the TVM as specified in Section 34 50 13, Ticket Vending Machines. This applies to maintenance mode, coin handling assembly, credit card module, audio, smart card reader, power supply management, external security and intrusion alarm, service keyboard, and downloading capabilities.

PART 3 – EXECUTION

For installation refer to Section 34 50 11, Fare Collection Equipment Installation.

END OF SECTION 34 50 19