# Integrated Bus Fare Systems

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Transit Ticketing North America
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DRAFT

**cta** Chicago Transit Authority

# CTA Bus Revenue Collection 2024

- **2018** Procurement Process Began
  - Market Survey, Industry Review, CTA Interviews
  - Detailed Specification
- **2022** Executed S&B Contract
- **2023** Design of Fareboxes, Cash Boxes, Cash Receivers/Vaults
- **2024 – 2025** Installation and Testing
  - System Integration Test and Final Acceptance
- **2026** Network Integration
  - Clever, S&B farebox, Ventra 3.0
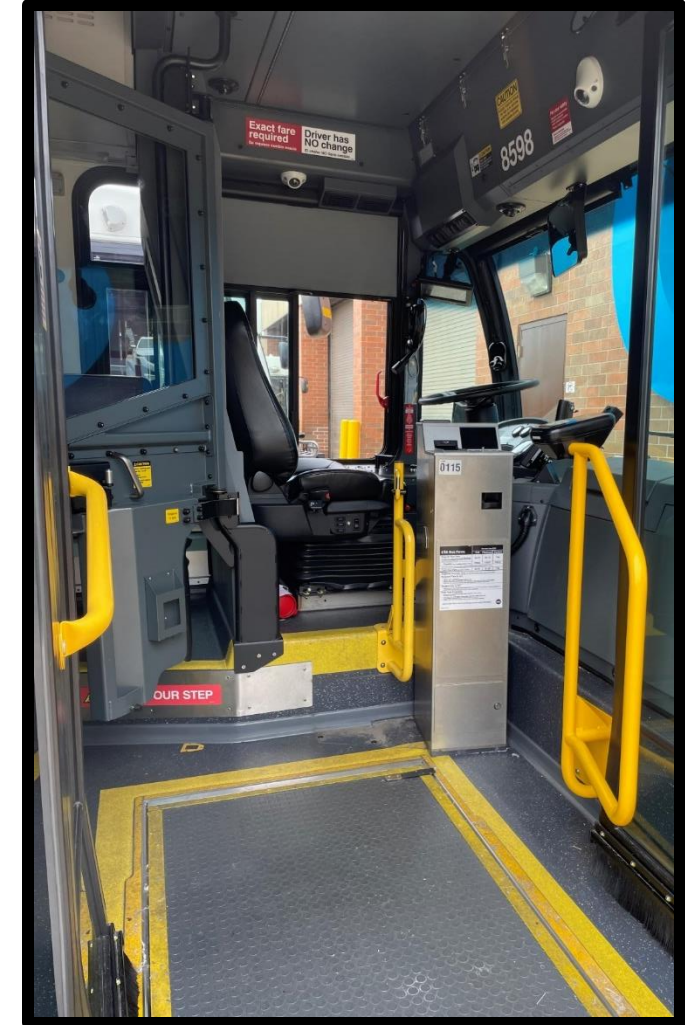
# Installation Lesson: 2000 buses in 14 months

- **Weekly meetings** to review progress and plan ahead
  - Milestone payments based on progress
- **Expect challenges**
  - Resource availability
  - Bus modifications
  - 10-15 buses per night
- **Accept Interruptions**
  - Software modification
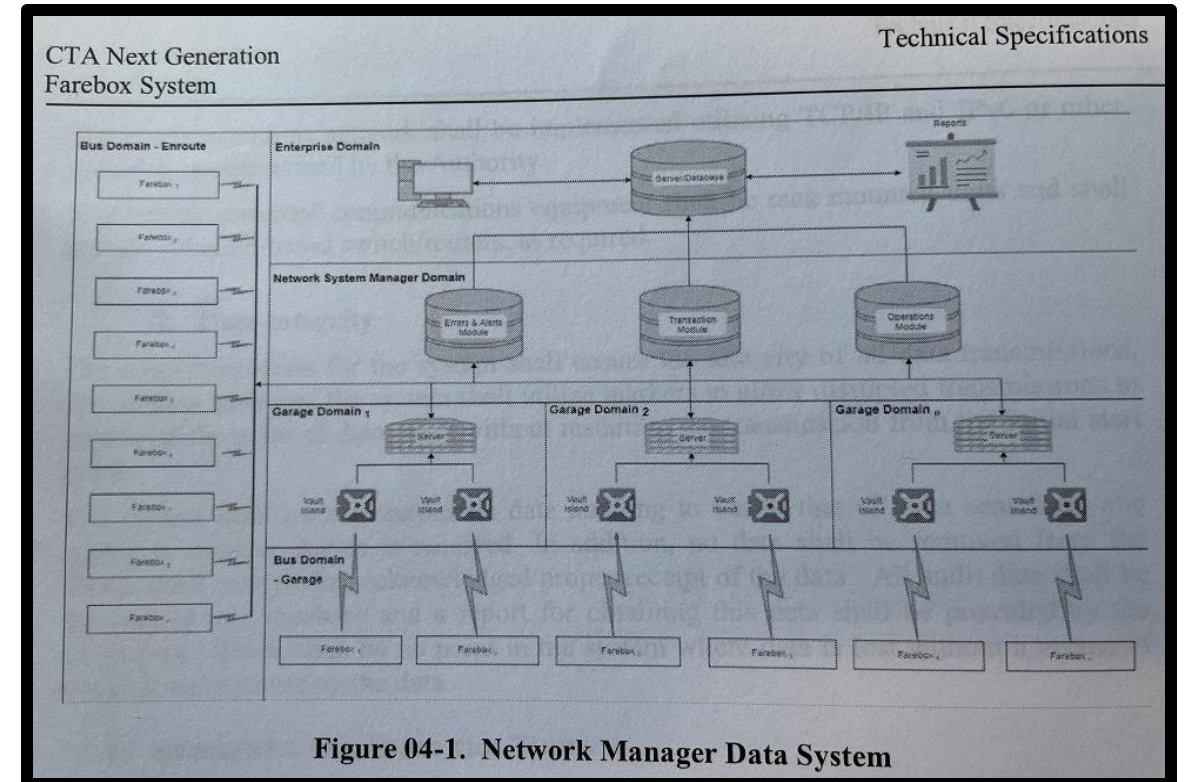  - Democratic National Convention
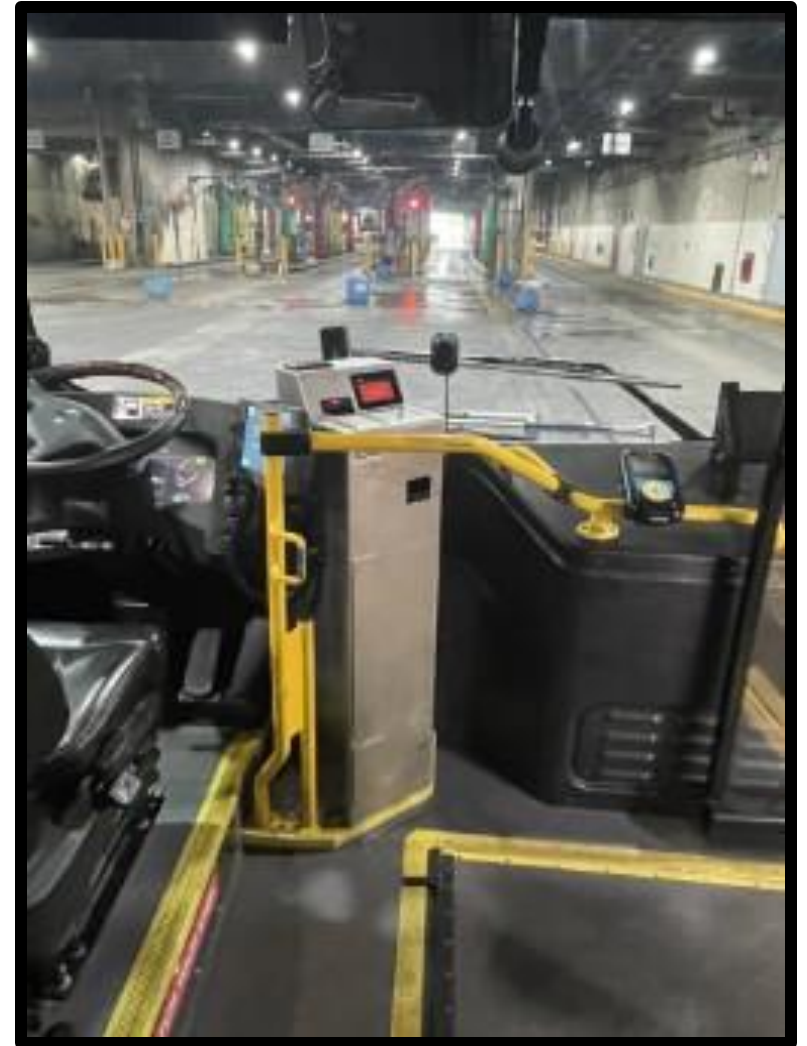
# Hardware installation is one thing...

- **Software and Data Management is another**
  - Farebox to Cash Receiver
  - Cash Receiver to Back Office
  - Back Office to CTA Database

- **CTA Issues**
  - Operations
  - Revenue
  - Ridership



Figure 04-1. Network Manager Data System

# Post Installation Activities

- **Operator Re-training**
  - Every Ride Counts

- **Revenue Issues**
  - Validating bill handling/bill rejection
  - Reconciliation: cash box to vault, vault to bank
  - Asset tags

- **Ridership Issues**
  - Bus reporting
  - Ridership categories
    - Full Fare Short
    - Multi-Ride Counts

## Bus Farebox Palm Card 2025

**Automatic Startup:** Farebox & Ventra MV start automatically via Clever Device.
- **If Farebox is Not Started:** Contact Controller for authorization to perform steps below.
- Press the "**Reset**" button for 5 seconds. If the farebox does not restart, press the "**Force Logon**" button.
  - **OCU Touchscreen:** Use finger or soft stylus ONLY.
  - **Hard tips or pens cause damage to the touch sensitive screen.**
- **If Ventra is not started:** Press "**Force Logon**" on the Driver Terminal.

**Damaged Bills (wrinkled, torn, or wet) will be rejected.**
- To manually accept and record the fare:
  - **Step 1**: Press "Other Functions"
  - **Step 2**: Press the value button corresponding to the rejected bill, ($1 to rejected $1 bill). Bill will then register.

**Coin Jams and Bypass:**
- To clear a coin jam: Operator should ask customer to press coin de-jam button (next to the coin slot repeatedly).
- **Bypass** (If persists): Contact Controller for authorization. Open Coin Bypass Slot (back of the farebox).

**cta** Every ride counts!

# Farebox Testing Protocols

- **Operational Readiness Testing**
  - Installation Testing - Completed
    - Equipment testing after each installation
  - System Integration Testing
    - End-to-end testing, including CTA interfaces

- **Acceptance Testing**
  - 180 days to confirm reliability requirements

# Integrated Bus Network

## S&B Fareboxes Created an Opportunity to Integrate Three Systems

- **Clever CAD/AVL**
  - Provides Route, Run, Operator ID and other data
  - Provides Single Point of Log On for the operator
  - Updates Route Changes
- **S&B Farebox**
  - Accepts, Counts and Transmits Cash Transaction Data
- **Ventra Card Reader**
  - Accepts Ventra Card Taps and Transmits Transaction Data

| Field | Description |
|---|---|
| Direction | Specifies the direction (N/S/E/W/Inbound/Outbound) of the Route the vehicle was running at the time of the fare transaction. The direction is set in Transit Agency's Scheduling System and linked to the Route in BusTools® by the BusTools® user. |
| Run | The piece of work the driver was running at the time of the fare transaction. The Run is defined in the Transit Agency's Scheduling System. |
| Block | The piece of work the vehicle was running at the time of the fare transaction. The Block is defined in Transit Agency's Scheduling System. |
| Garage ID | The garage for the piece of work the driver was running at the time of the fare transaction. The Garage ID is defined in Transit Agency's Scheduling System. |
| Route | The Route ID defined in BusTools® by the BusTools® user which represents the route variation the vehicle was running at the time of the fare transaction. |
| Stop | The stop the vehicle was servicing at the time of the fare transaction. Note: The Stop is defined in Transit Agency's Scheduling System. |
| Position | The Vehicle Position (Lat / Long) at the time of the fare transaction. |
| Operator ID | The ID the vehicle operator used to log on to the TCH with. |
| Bus ID | The ID of the vehicle. |
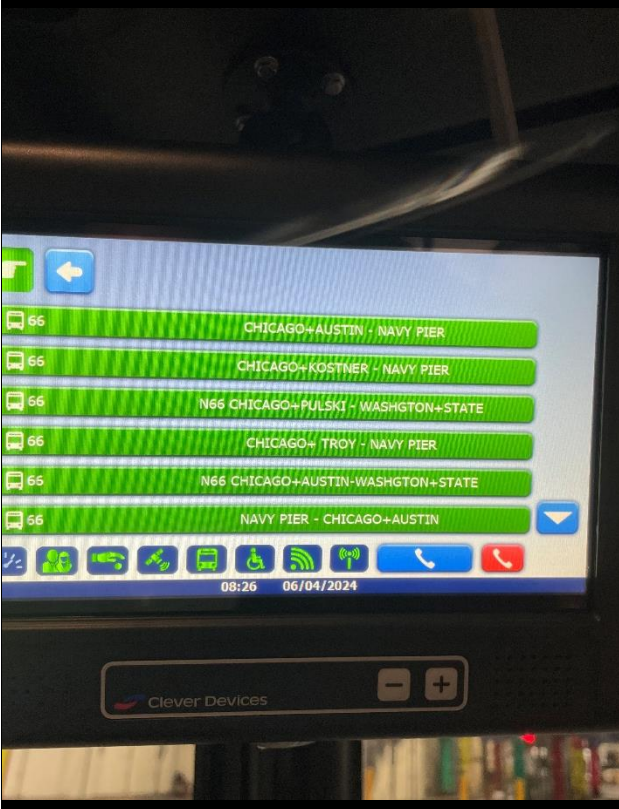
Clever Log On
Route Data
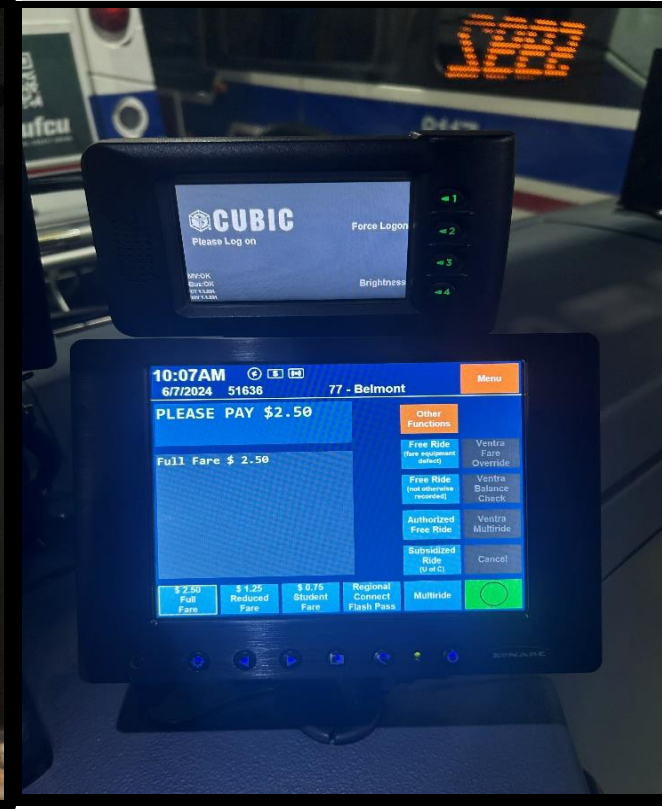
Cubic Driver Terminal
S&B Operator Control Unit

S&B Farebox

Cubic Card Reader

MP70 and Cradlepoint Routers not included

Chicago Transit Authority

# Scheidt & Bachmann – Fare Collection Systems (FCS)

We are a leading provider of system solutions that make using public transport easy. In partnership with transport operators around the world, we are committed to making travel as pleasant and stress-free as possible for passengers.

**We'll take you there.**

# North America FCS Offices

Lowell Headquarters, Production, Service

Buffalo - Service

Chicago - Office, Service

Elmsford - Service

Fredericksburg - Service

Kitchener - Office, Service
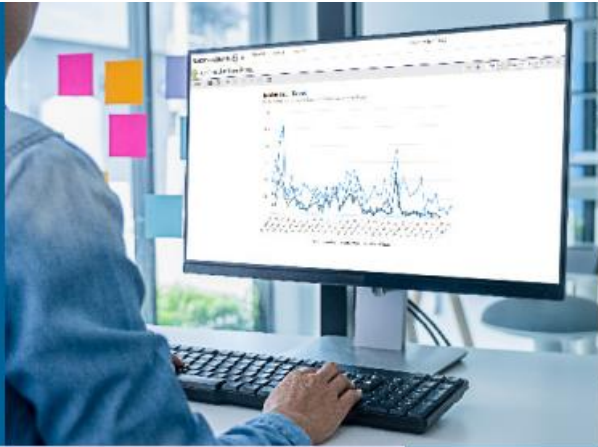
Ottawa - Office, Service

Phoenix - Office, Service

Pittsburgh - Service

Toronto – Canada Headquarters, Service

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## Software Solutions

- Central System Platforms
- Account-based Ticketing
- Data Management
- Device Management

## Sales & Validation Devices

Ticket Vending Machine

Fareboxes

Faregates

Validators

## Services

- Core Services
- Hardware Services
- Software Services
- Managed Application Hosting
- Financial & Payment Services
- Network Services
- Security Services

## Scheidt & Bachmann Fare Collection Systems

# Smart solutions for your fare collection

Scheidt & Bachmann Fare Collection Systems is a leading provider of system solutions that make using public transport easy. In partnership with transport operators around the world, we are committed to making travel as pleasant and stress-free as possible for passengers.

# Farebox System

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# FareGo FB|30

Next generation farebox designed for simplicity, durability and longevity

**Fast and easy payment**

**Long-lasting solution**

**Industry leading design**

# FareGo FB|30

- Stress-free boarding increases passenger experience

- Easy to use and intuitive customer interface

- Fast and accurate coin and bill validation

- Reduced bus dwell-times

- Easier on-site maintenance thanks to modular design

- High-quality units are long lasting and reduce repair and replacement costs

- Designed to withstand the harsh operating environments like vibration, dust, washing or temperature changes
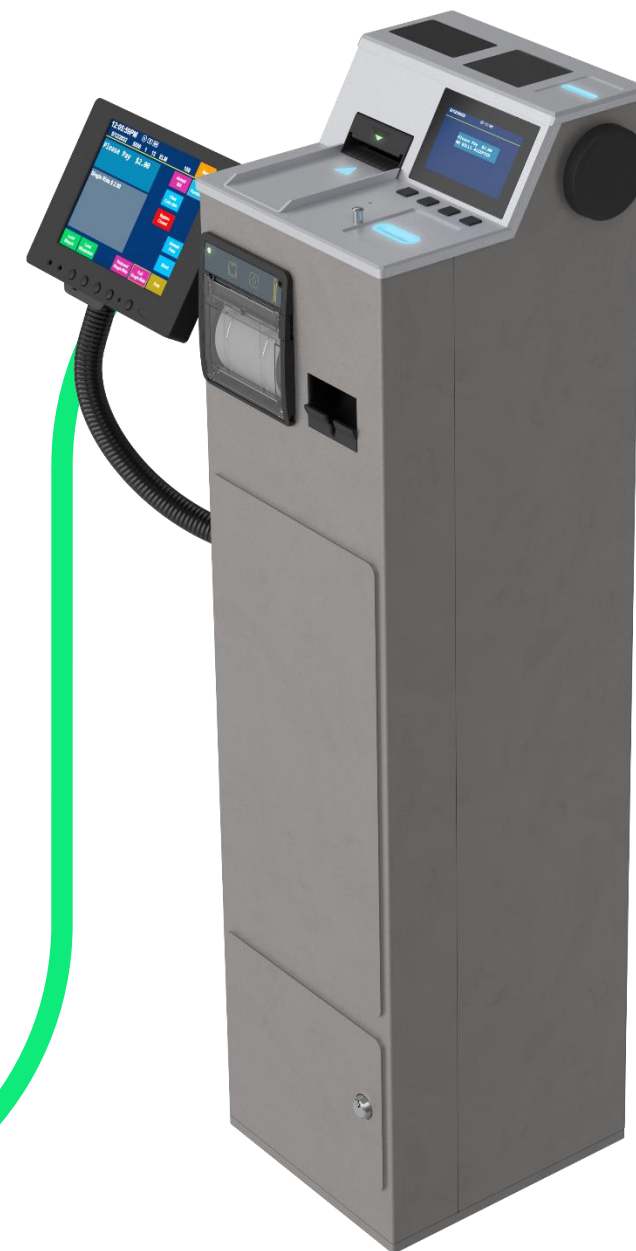
# Cash Receiver System (CRS)
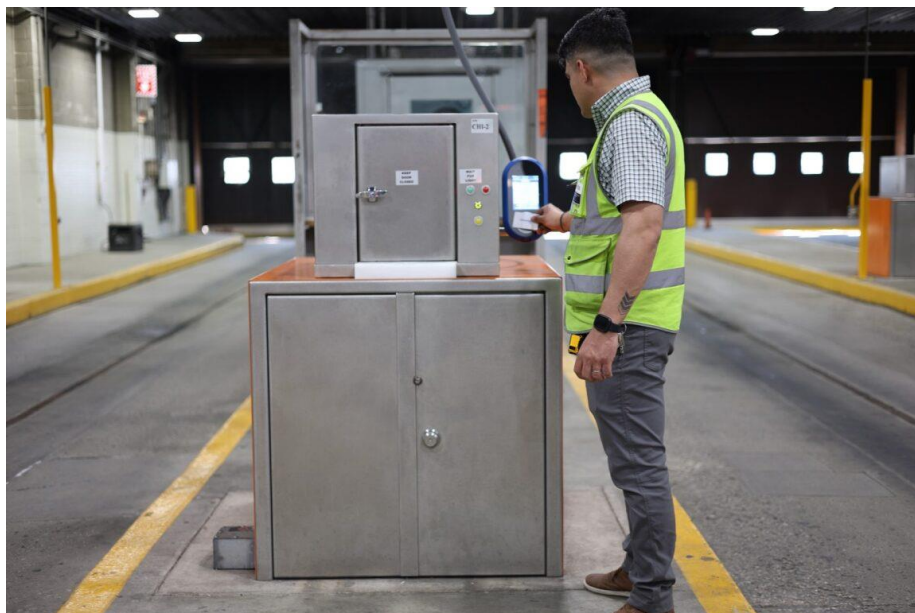


**The Cash Receiver System provides a highly secure, reliable, easy-to-use system and facilitates a quick turnaround of the buses during revenue servicing operations.**

**Function**

The main functions of the garage system are:

• Consolidation and transfer of cash revenue from

Fareboxes into cash receivers into a secure vault

• Data transfer between Fareboxes, garage equipment

and the backoffice system for the purpose of probing

and cashbox vaulting

• Auditing capability of single cashboxes

# CTA Farebox Deployment – Project Highlights

## Farebox / CRS Deployment

- **2,000+ FareGo FB|30 fareboxes** deployed
- Installed at CRS systems **7 CTA bus garages**
- Completed in just **49 working weeks**

## Project Timeline

- Project start: **Dec 2022**
- 3-month pilot phase
- Full rollout completed: **April 2025**

## Execution Highlights

- Integration with CTA infrastructure
- On-time delivery of all fareboxes
- Feedback gathered from field operations
- Real-time data functions activated

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# Execution Learnings & Acknowledgment

## Local Advantage

## (Chicago Office opened Aug 2024)

• Enabled faster coordination

• Supported real-time issue resolution

• Helped manage garage-level rollout

complexity

## Acknowledgment

Scheidt & Bachmann appreciates the opportunity to complete this major deployment under contract with the Chicago Transit Authority. This project highlights our capacity to deliver large-scale, schedule-driven transit solutions across North America.

## Lessons Learned

• Local presence improves agility

• Coordination drives schedule adherence

• Real-time adaptability ensures success

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# What comes next?

- Ventra 3.0 Implementation
  - Removal of Driver Terminal
- More Testing
- Decommissioning
- Ridership and Revenue Data Integration
- Other Mobility Integrations
  - Water Taxis
  - Regional Bus Lines
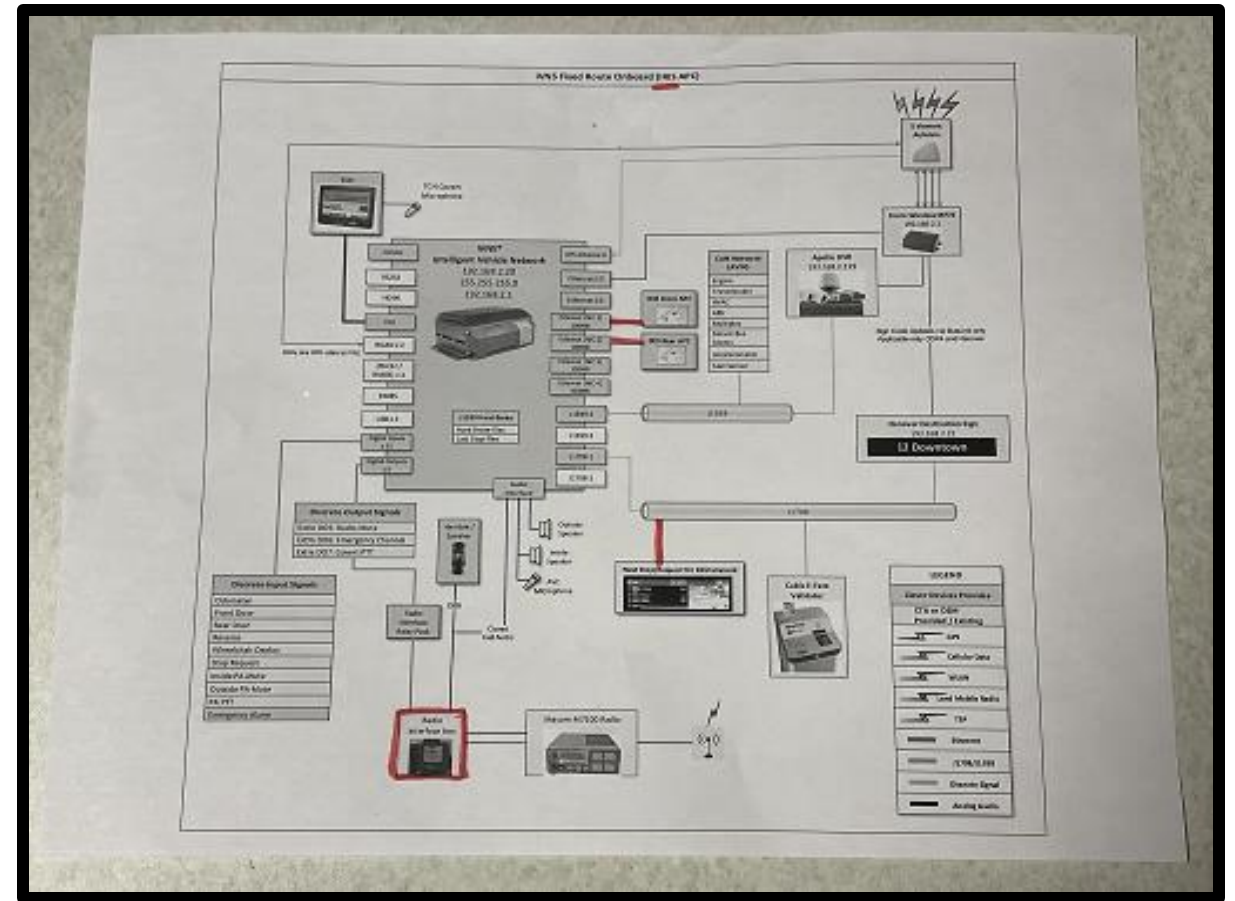- Modified Cash Collection Process
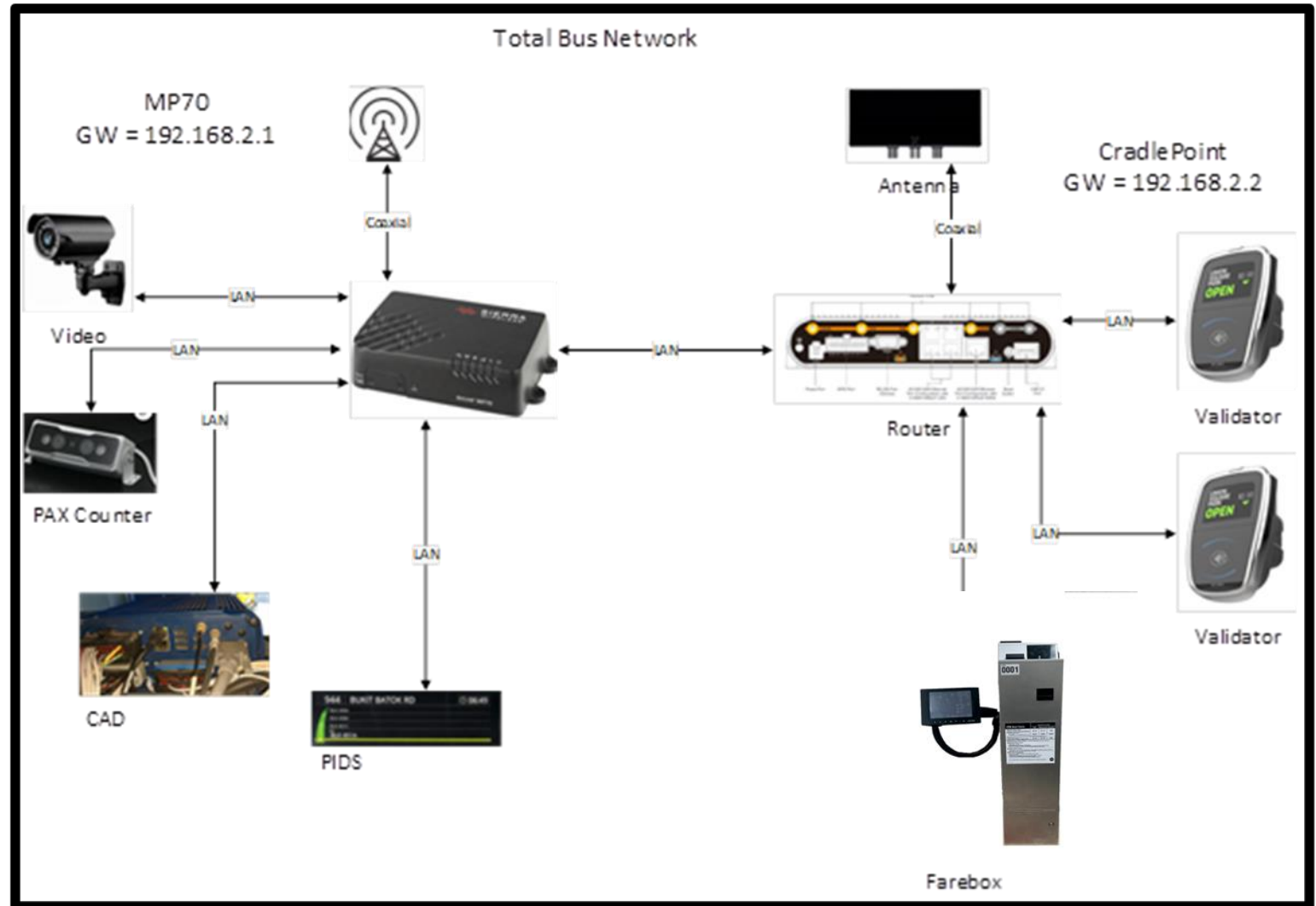
# What does it take to Integrate?

- **Clear Objectives** and Guiding Vision
- **Common Understanding** of Terms
- **Cooperating Vendors**
  - Clever, S&B, and Cubic
- **Cooperating CTA Departments**
  - CTA IT
  - Bus Engineering
  - Bus Maintenance
- **Testing Protocols**
- **Patience**
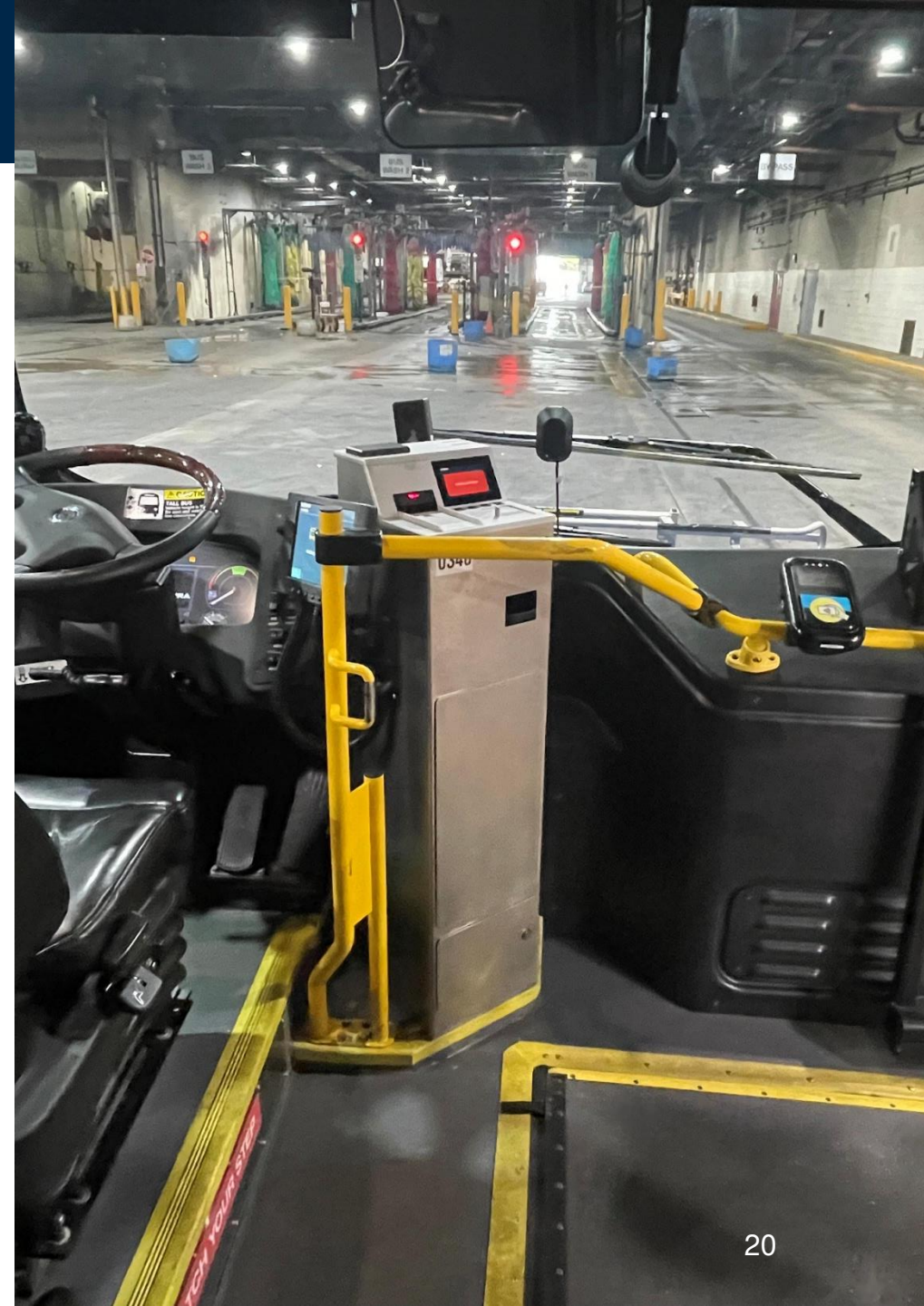
# Bus in a Box for Testing Integrated Bus Network

**Keene Model K-25 1960s**

**Grant Electrofarer 1960s-70s**

**Duncan Acceptafare 1970s-1980s**

**GFI CentsABill 1986**

Chicago Transit Authority

# CTA Farebox Team   2025

# A long time ago in a galaxy far, far away...