

# Fleet-Wide Vehicle Security Camera System Implementation -What You See and Don't See

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Rail Conference



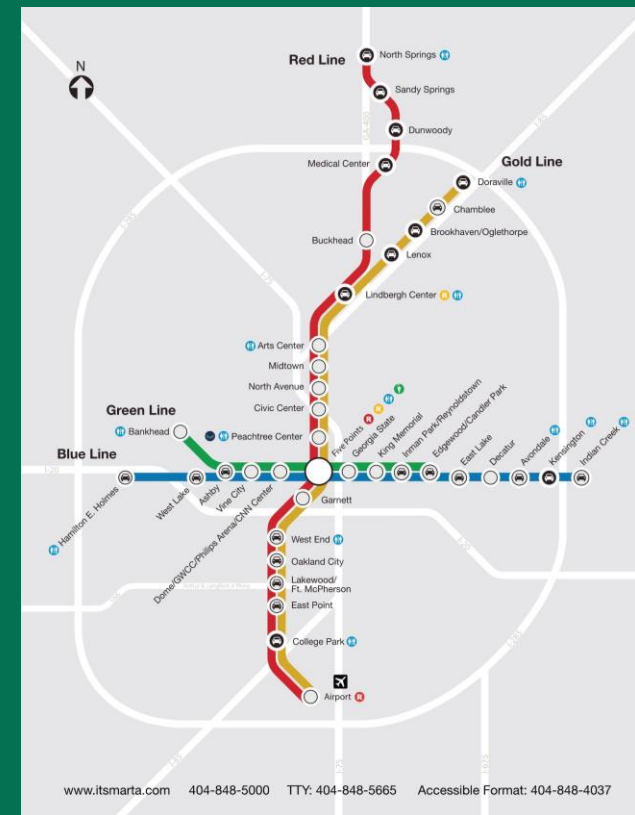
# Key Presentation Take-Aways

- What Does the System Do
  - Increases Safety & Security
  - Improves Situational Awareness
  - Improves Investigative Efficiencies
- Systems Approach - Complete, Holistic Solution
- Current Tech/Future Tech



# Metropolitan Atlanta Rapid Transit Authority (MARTA)

- 9<sup>th</sup> Largest Transit Agency in US
- 3 Modes; Rail, Fixed Bus, Paratransit
- 500,000+ Passenger Trips/day
- 38 Stations, 48 Mile
  - Double Track



# Vehicle Fleet Description

- 300+ Rail Vehicles
- 3 Rail Maintenance Yards
- 580 Fixed Route Buses
- 3 Bus Dispatch/Maintenance Garages
- 180 Paratransit Vans (“Mobility”)
- 1 Paratransit Maintenance Facility

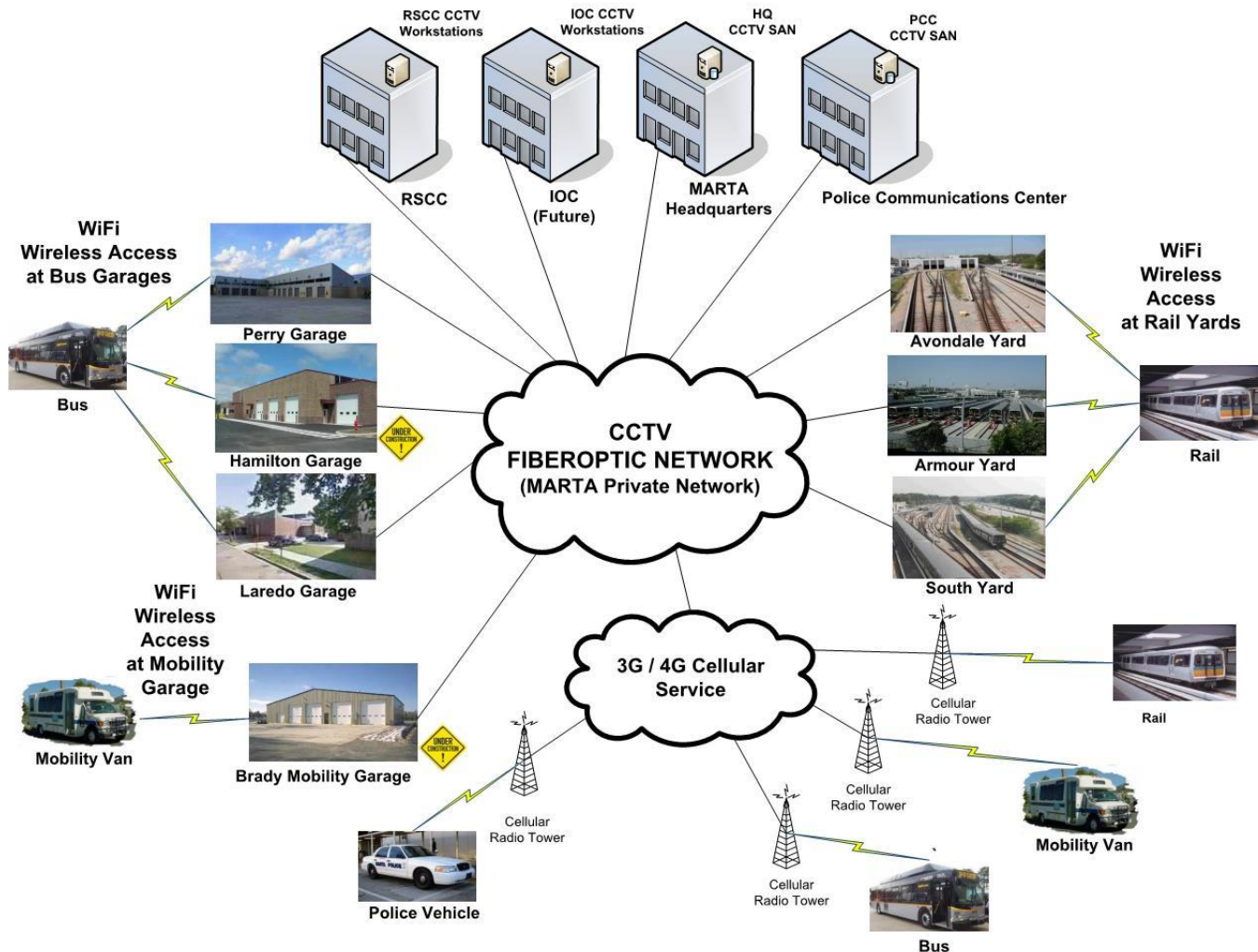


# Vehicle Security Camera System Requirements

- All Revenue Service Vehicles
- Internal/External Coverage
- On Board Storage-7 Day minimum, 30 day goal
- Clip Tagging with Wireless Download
- Live Look In



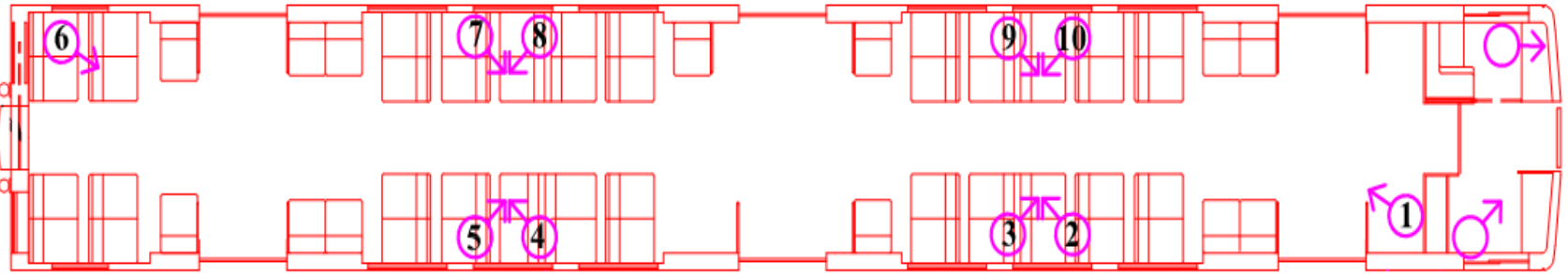
# Vehicle Security Camera System



# Vehicle Security Camera System Facts

- 8 – 12 Cam/Vehicle; 11,000 Cam Total
- On-Board Storage; 4TB for Rail, 2TB for Bus and Mobility
- Mobile Router; 802.11n + Cellular
- Video Management System
- Robust Tagging and Search Features
- Dual SAN's for Off-Board Storage

# Rail Vehicle Camera Layout



**RAIL VEHICLE (TYPICAL)**

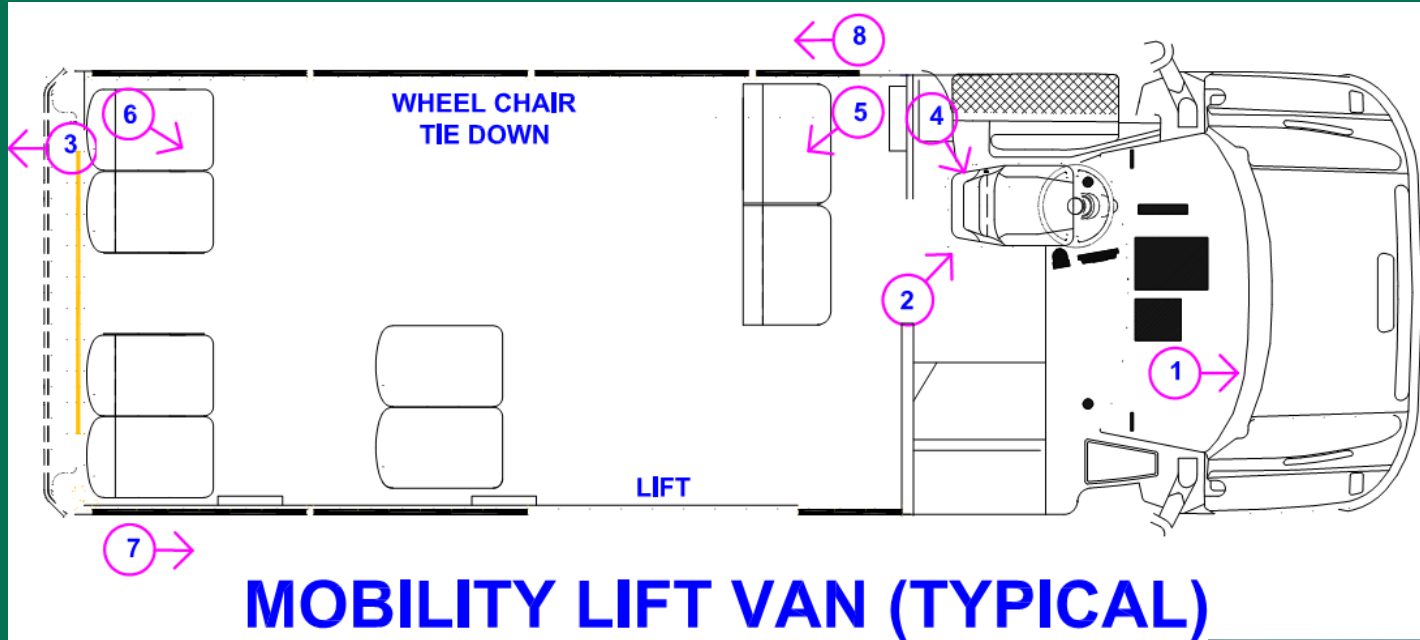




# Rail Vehicle Camera Views



# Mobility Vehicle Camera Layout

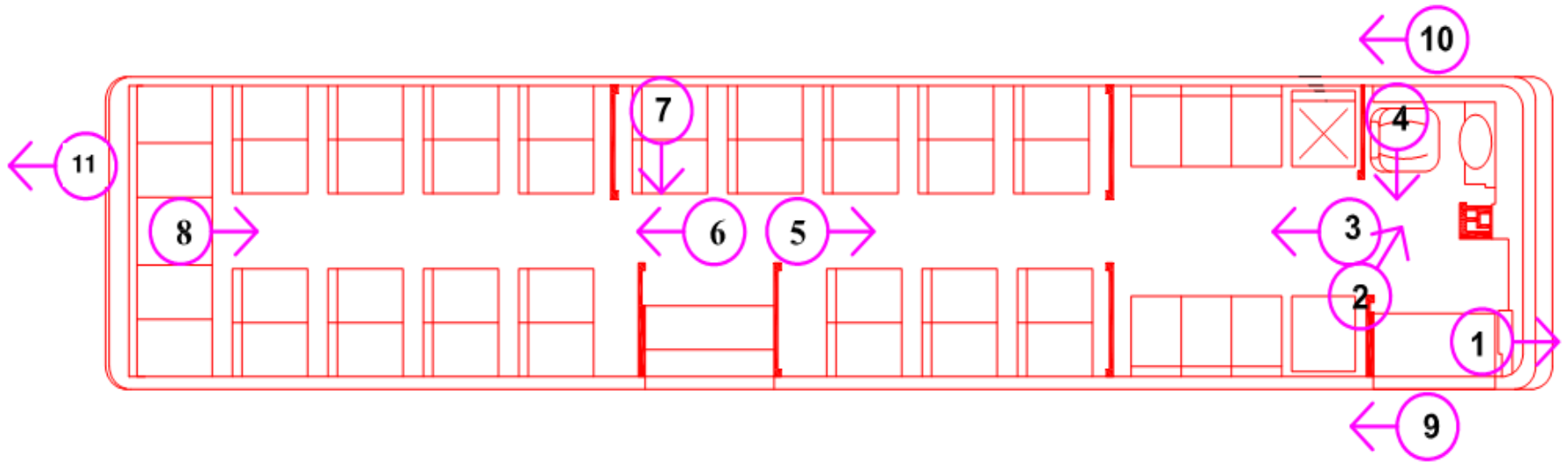




# Mobility Vehicle Camera Views



# Fixed Route Bus Camera Layout



## FIXED ROUTE BUS (TYPICAL)



# Fixed Route Bus Camera Views



# Vehicle Security Camera System Sample Clips

- [MARTA Bus Clip 1\\_Driver Event](#)
- [MARTA Bus Clip 2\\_Accelerometer](#)



# Infrastructure Description-NIC

- Dedicated CCTV WAN; Fixed & Mobile
- Dedicated CCTV WiFi; Each Facility
- Redundant Servers; User Workstations;
  - RSCC; Rail Services Control Center
  - BCC; Bus Communications Center
  - PCC; Police Communications Center
  - IOC; Integrated Operations Center
- Video Clip Storage; Redundant SANs



# Maintenance Facility Layout – Armour Yard





# Maintenance Facility Layout – Perry Blvd Bus



# Infrastructure Functional Characteristics

- MARTA Private Network
- Dual Storage Locations (Plus On Vehicle)
- Dispatch Center/Police Live View
- Wireless Download and Search
- Clips Available to Requester the Next Morning



# Cool Stuff, But....Lessons Learned

- Storage/Transfer Capacity vs Image Quality
  - Wireless Download Capacity-Never Enough
  - Continuous Connectivity
  - Operational Considerations-Bus Parking
- Robust VMS Parameters
  - Don't Lose Data on Power Shutdown
  - Wireless Updates (NVR and Router)



# Cool Stuff, But....Lessons Learned

- Maximize Maintainability
- One Contract vs Multiple Contracts
- Policy/Procedure Development
- Video Upload vs Patron WiFi



## **Even Cooler Stuff...**

### **Future Capabilities/Considerations**

- One Mobile Router; All Systems on Vehicle
- In Vehicle WiFi
- Increased Download Capacity
  - 802.11ac/ad & 5G
- Increased Download Opportunities; Bus Loops, Rail Stations
- Rail System Wireless Build-Out
- New Bus Types

# Thank You!

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