



▶ BART Communications-Based Train Control (CBTC) Project Update

November 14, 2025 | SFMTA Train Control Upgrade Project Committee Meeting

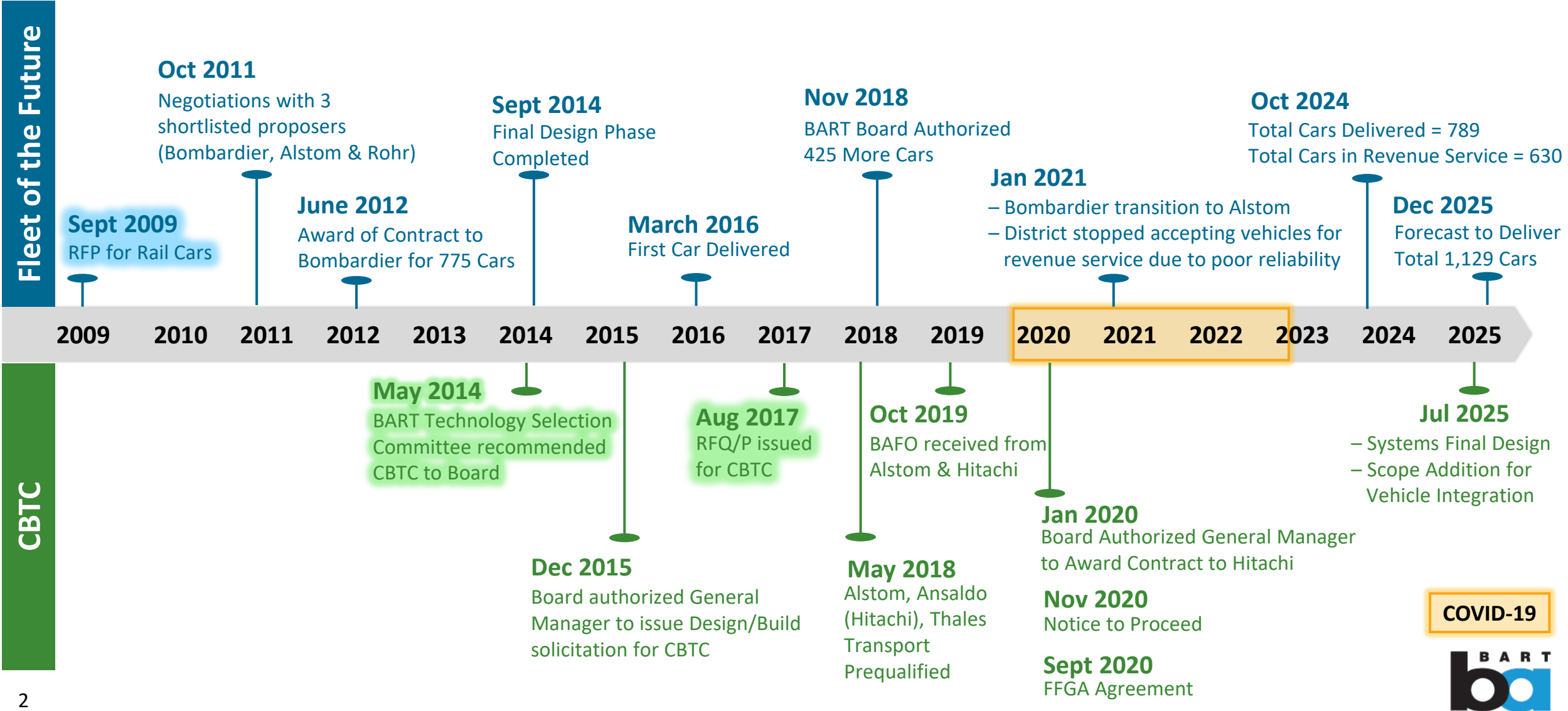


Overview

- History of BART's Fleet of the Future & CBTC
- CBTC Overview
- Vehicle Sub Systems Interface
- A “One Team” Approach

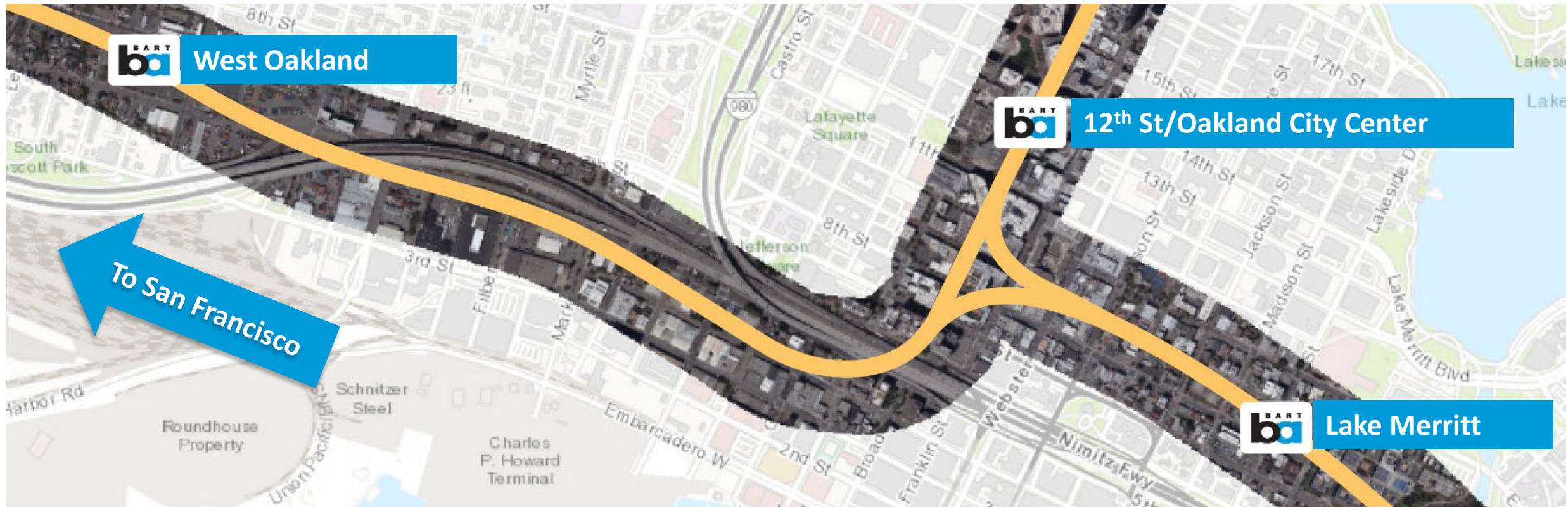


History of BART's Fleet of the Future & CBTC

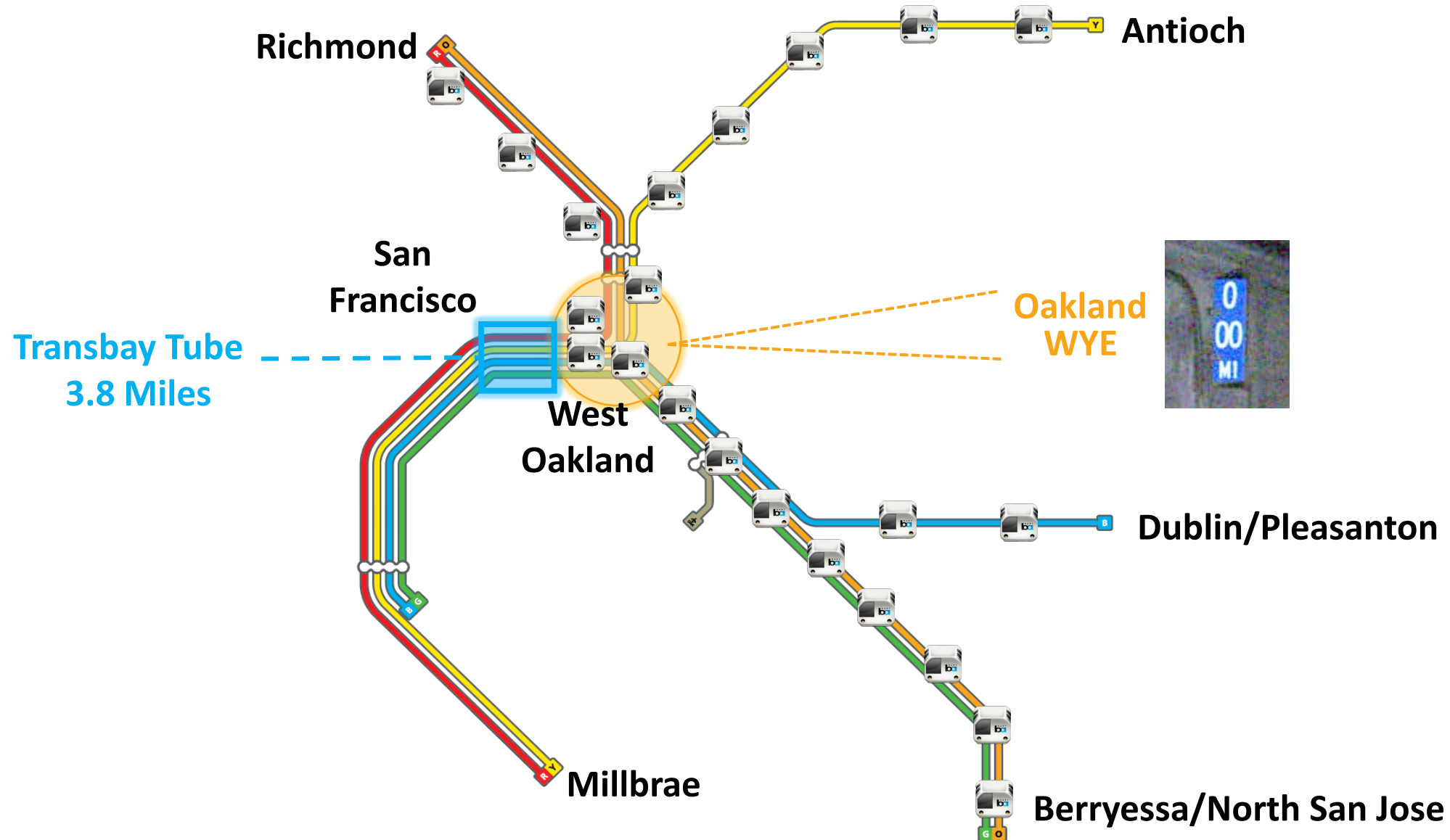


The Why of the WYE

Oakland WYE “A triangle of railroad track”



30 Trains Per Hour through the WYE only with CBTC



Fixed (Legacy) vs Moving Block (CBTC)

Existing vs Modern Train Control Systems

Fixed-Block Signaling System (Legacy)



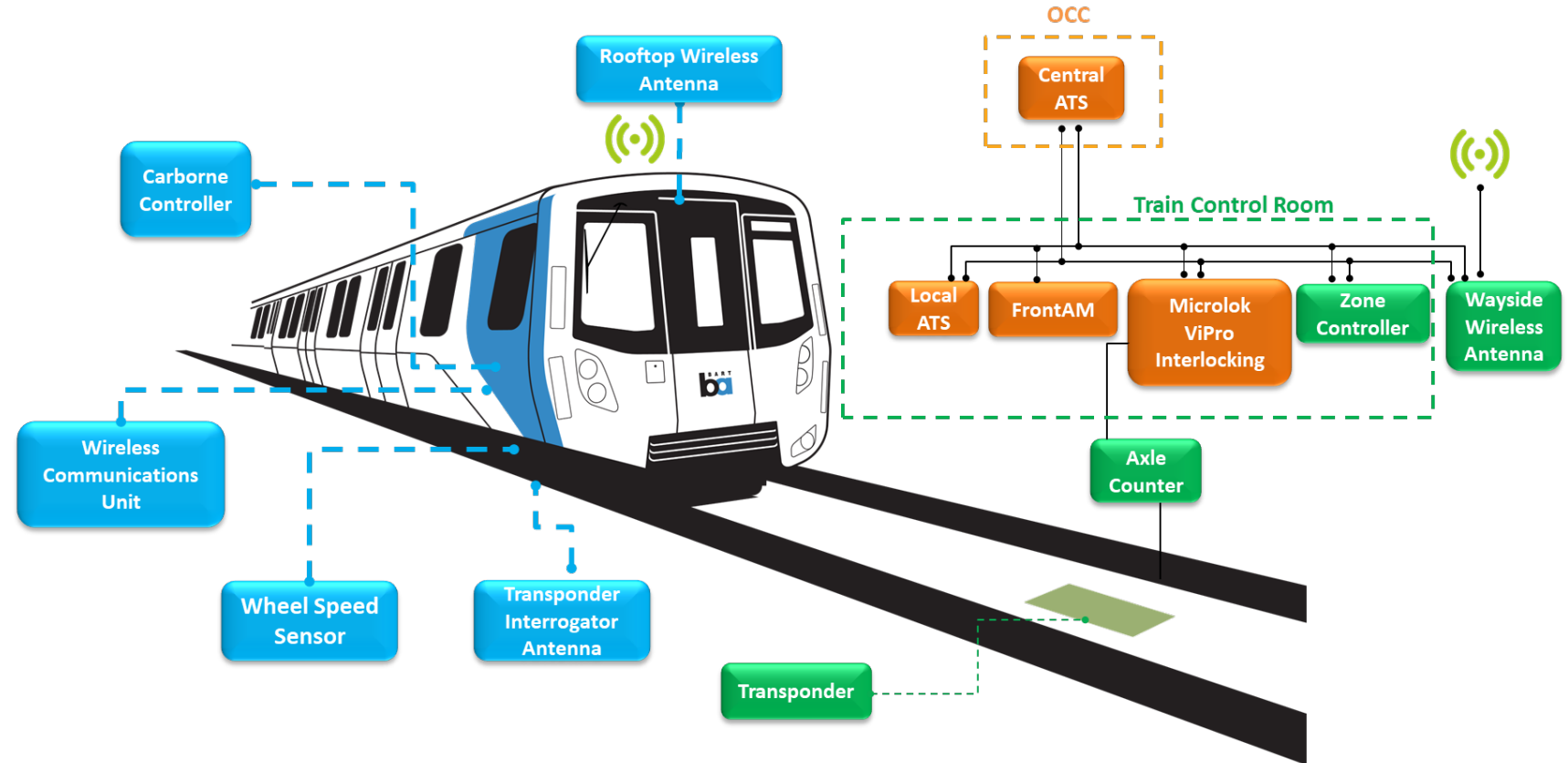
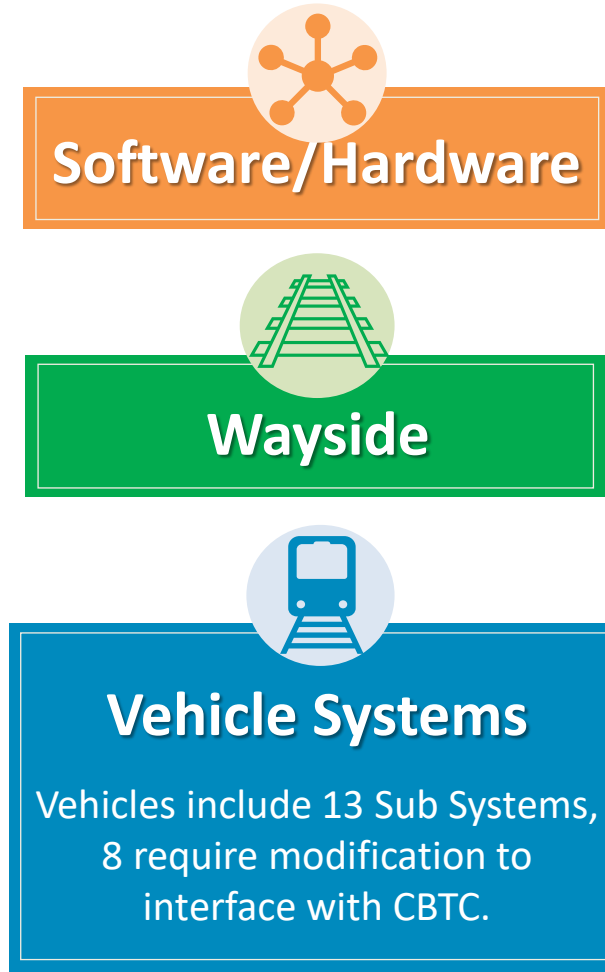
- Legacy Train Control Technology
- 24 Trans-Bay trains per hour per direction during peak hour
- Distances maintained with safety. Capacity can not be increased, even with more trains

Communications-Based Train Control

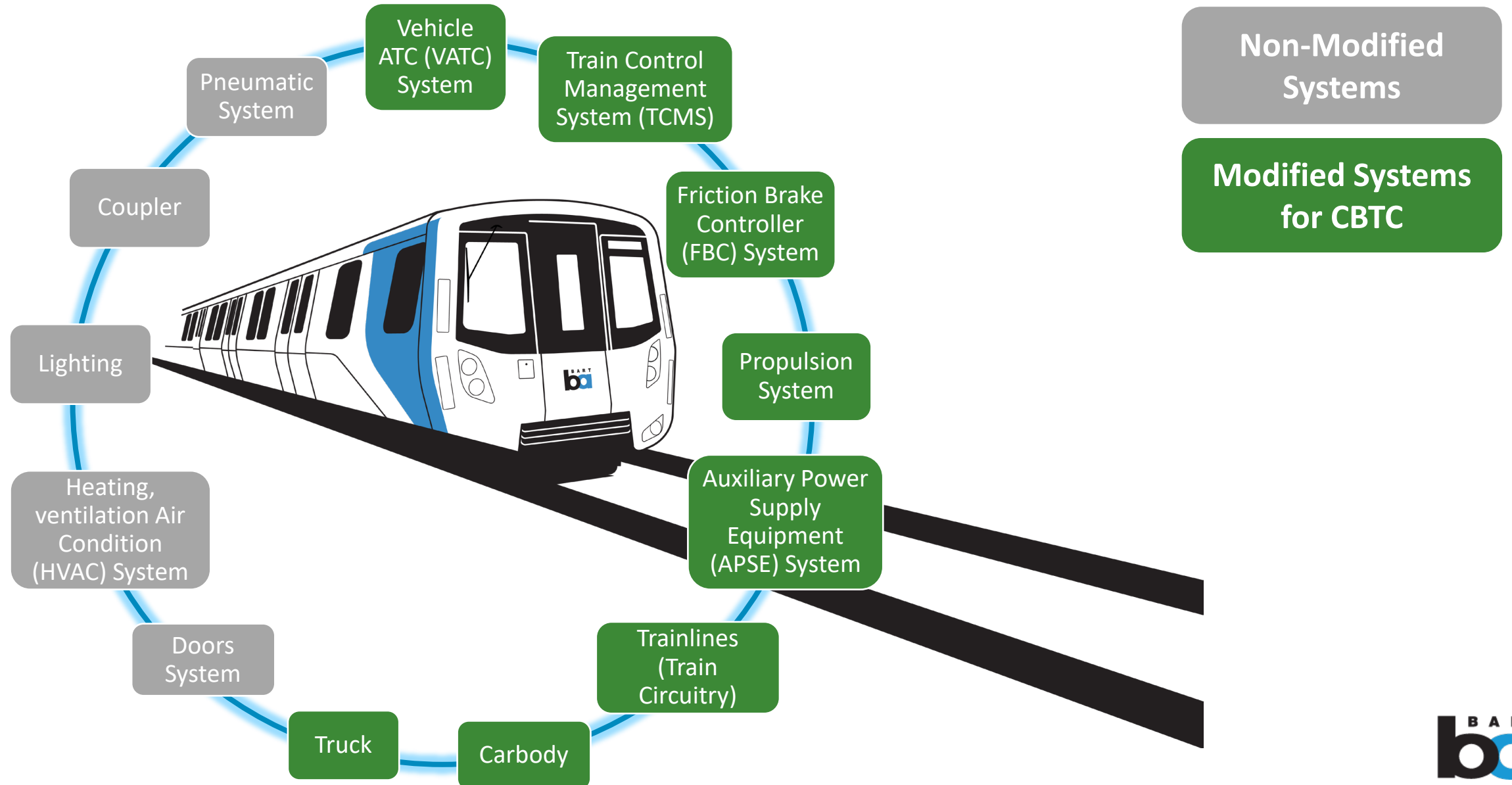


- Needed to Increase Capacity & Assure Reliability
- 30 Trans-Bay trains per hour per direction during peak hour
- Trains constantly communication to maintain safe distances and allow more trains to run closer together

CBTC Elements



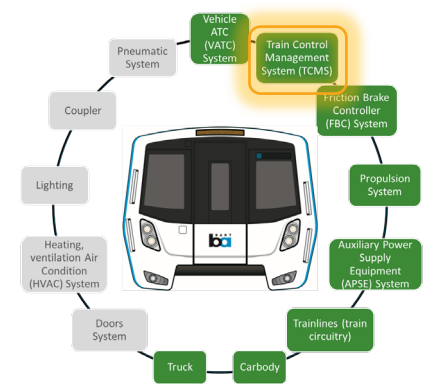
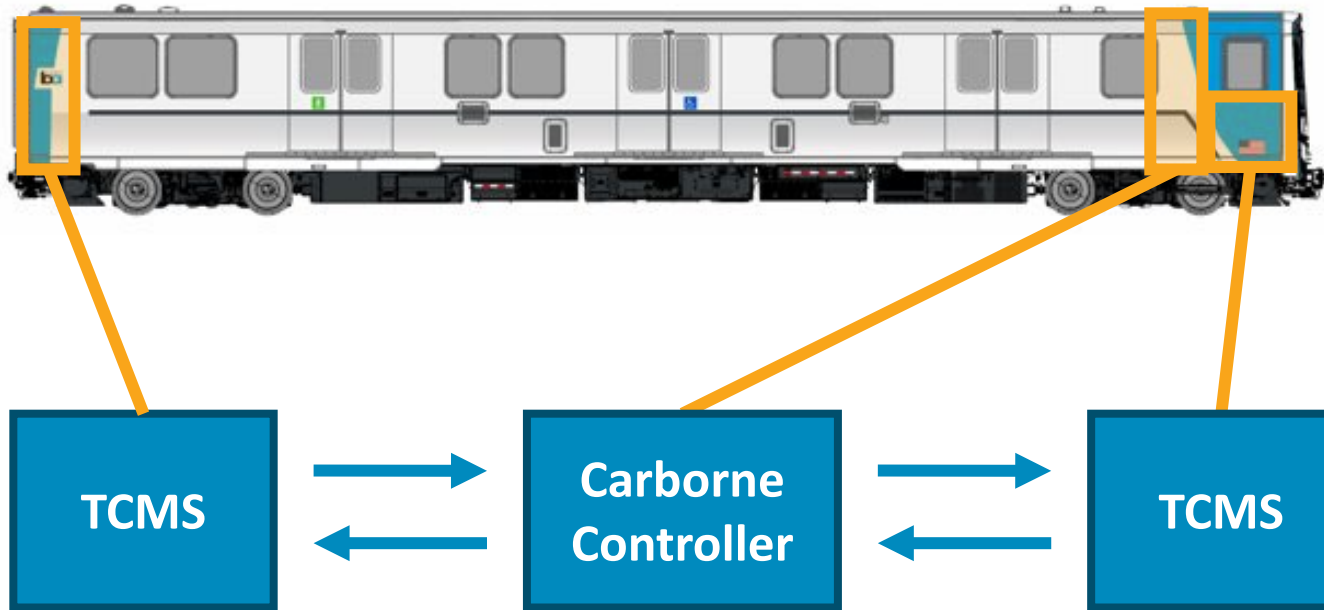
Vehicle Sub Systems Interface



Sub Systems Interface: TCMS

Train Control and Monitoring System (TCMS):

- Provide information to the Train Operator with the Train Operator Display (TOD)
- Supervises and controls onboard subsystems such as propulsion, braking, doors, HVAC, diagnostics etc.
- Allows all systems to communicate with each other



Train Control & Monitoring System (TCMS)

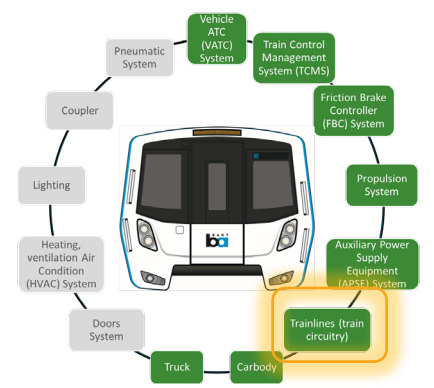
- **Hardware:** No
- **Software Adaptation for CBTC:** Yes
- **Function:** Interfaces with the carborne controller.
- TCMS provides commands to carborne controller for propulsion, brakes, doors, HVAC, lighting. Carborne Controller will process commands and send speed to TCMS.

Modified System
for CBTC

Sub Systems Interface: Trainline

Trainline System (aka Train Circuitry)

- Trainlines are bundle of cables and wires running thru the train cars carrying power, signals and connecting various systems: doors, brakes, signaling, communication, sensors etc.



- Existing
- Modification for CBTC

Trainline System with CBTC

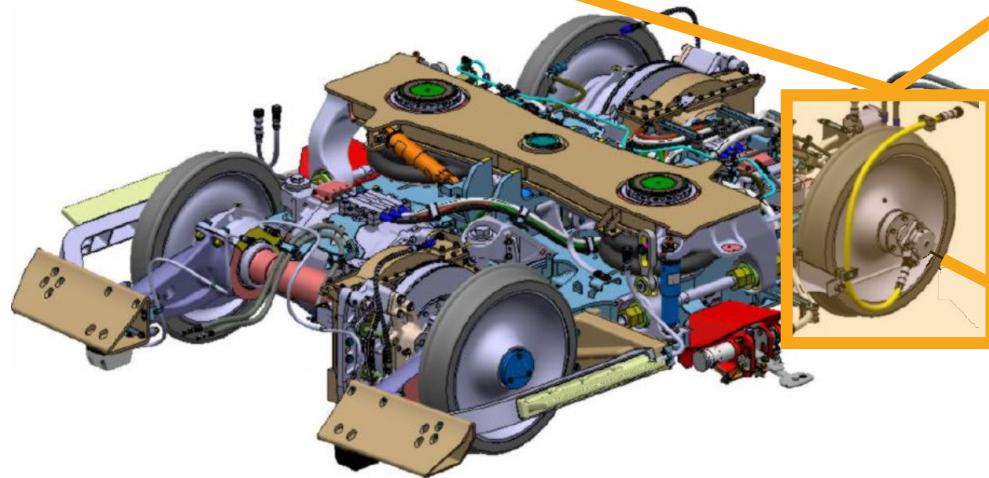
- **Hardware:** Yes (Partial Elements)
- **Software Adaptation for CBTC:** Yes
- **Function:** New cabling and wiring for sensor, carborne controllers, power supplies, connectors and control logic changes

Modified System
for CBTC

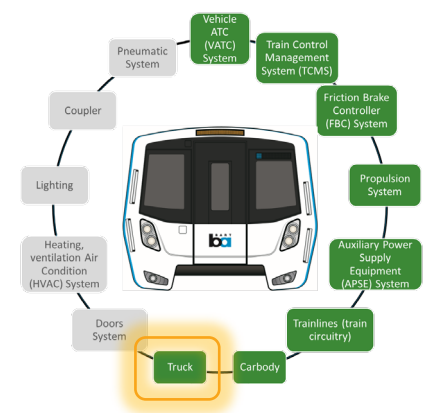
Sub Systems Interface: Truck

Truck System:

- Provide the motoring powers and effort to the axles & wheels
- Manage the Suspension
- Contains the 3rd rail mechanical interface components

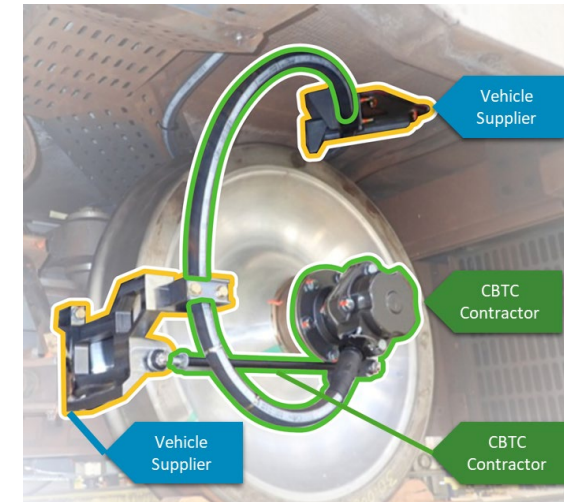


Speed Sensor



Truck System with CBTC

- **Hardware:** Yes (Partial Elements)
- **SW Adaptation for CBTC:** Not applicable
- **Function:** Adaptation of the axles to fit the CBTC Speed Sensor.



Modified System
for CBTC

A “One Team” Approach

Leadership

- Executive Engagement
- Partnering
- Assigning the right team per the phase of the project
- Decision Making

Team

- Flexibility
- Roles & Responsibilities
- Co-Location
- Technical Interface Requirements
- Manageable Schedule
- Stakeholder Engagement
- Dedicated Resources

Proof of Concept (Test Track)



Supervision Software (ATS)



Thank You

