Caltrain Broadband Wireless Communications Project

Project Overview

- Create a wireless **train to wayside** communication link for various uses by Caltrain and its passengers – that does not currently exist on Caltrain

- **Continuous coverage** from San Francisco to San Jose matching proposed EMU service area

Caltrain Goals (Vision 2040)

- Caltrain shall make a priority of enhancing equity in its system, focusing on the diverse constituency of riders who depend on transit for essential travel and addressing the historical inequities that have caused the rail service to be disproportionately underutilized by lower income riders and people of color

- Caltrain recognizes its unique position as a critical link within the Bay Area's passenger rail network. The railroad will undertake policies and actions that improve its connectivity to other transit systems to strengthen its role as part on a regionally integrated network

- Caltrain must address the needs of the present (during the COVID-19 pandemic), while simultaneously planning for and working toward a long-term future. The railroad will endeavor to proceed on a **path of recovery and growth** that anticipates, advances and, where possible, accelerates the incremental delivery of the 2040 Long Range Service Vision.

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Project Goals

- Deliver a **turnkey solution** for broadband wireless connectivity to EMUs

- Provide **train to wayside** connectivity for needed Caltrain specific solutions

- Deliver a **high-quality onboard WiFi solution that attracts riders** by enhancing the value proposition to support choosing Caltrain as their first and best solution for commuting through the Peninsula and Silicon Valley

- Leverage Caltrain's **existing fiber network** along its right-of-way

- Seek to **avoid technical obsolescence** with a defined technology roadmap over the next 10-years

Project Scope

- **Customer Experience**
  - High-quality onboard WiFi solution

- **Passenger Information Systems**
  - Real-time connectivity for onboard messages and other content generated from Caltrain's Central Control Facility

- **CCTV**
  - Connectivity for EMU CCTV
  - Allows real-time, 24/7 monitoring of onboard activity at Caltrain's Central Control Facility

- **Passenger Counting System**
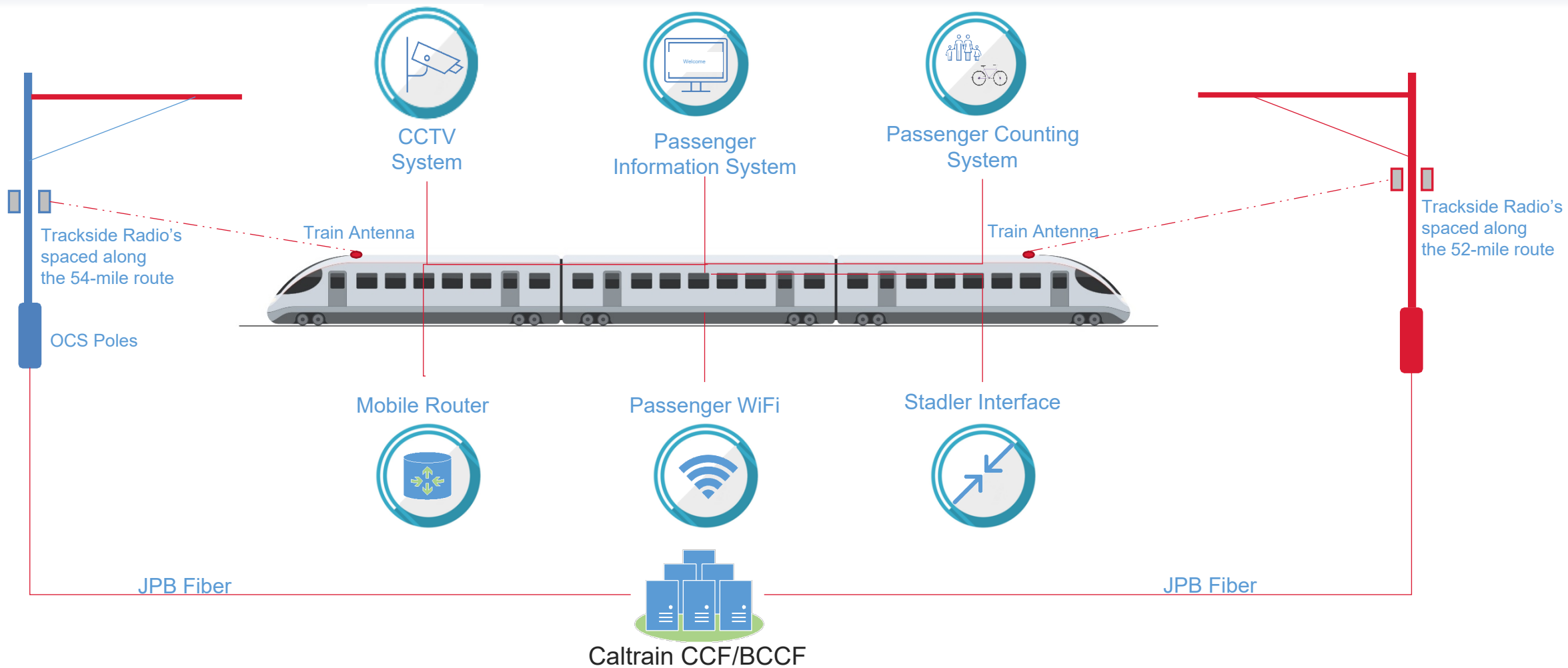 - Connectivity for data collection at Caltrain's Central Control Facility

Project Requirements

- **Technology**
  - Open to any technology
  - 4G, 5G, private LTE, and trackside solutions

- **Performance – Customer Experience**
  - Quick onboarding of the WiFi connectivity
  - Continuous coverage from San Francisco to San Jose
  - Minimum of 100 megabits/sec per train
  - High-quality connection that avoids dropouts
  - 99.9% uptime within Caltrain operating hours

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Project Requirements

- The Open Technology approach allows for an evaluation of a **wide range of technologies** to select the **best solution** given

  - Types of systems deployed onboard the train (WiFi, CCTV, etc.)
  - Number of riders and trains

- Identify **potential future revenue** or partnership opportunities – for Caltrain's consideration

- **Minimize alterations** to the EMU and integration into the Stadler onboard network

Project Conceptual Design

CCTV System

Passenger Information System

Passenger Counting System

Train Antenna

Train Antenna

Trackside Radio's spaced along the 54-mile route

Trackside Radio's spaced along the 52-mile route

OCS Poles

Mobile Router

Passenger WiFi

Stadler Interface

JPB Fiber

JPB Fiber

Caltrain CCF/BCCF

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Future Proofing the Technology

- Identify a **clear roadmap** with the ability to leverage advancements in technology

- Future Potential – **Customer Facing**
  - Advertising
  - Premium services, such as increased bandwidth for streaming, etc.

- Future potential – **Caltrain Systems**
  - Dynamic onboard map and messaging
 - Enhanced EMU Health Monitoring & Data Collection

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Procurement **Schedule**

- RFP Released - October 8, 2021

- Pre-proposal Conference –October 20, 2021

- Site Visit – October 21, 2021

- Q&A Period - October 27, 2021

- Proposals Received – December 30, 2021

- Oral Interviews – Week of Jan 31, 2022

- Live Demonstrations– April – May 2022

- Proposer Negotiations – June – August 2022

- Recommendation for Award – September 2022

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Procurement Live Demonstration

- **Intent**
  - Proof of concept
  - Demonstrate technical capabilities of proposed solution

- **What and Where**
  - Mount track side equipment on two signal bridges ¾ of a mile apart
  - Mounted equipment on a test train (locomotive, cab car and car)
  - All testing was done overnight from 11:30pm – 4am

- **Testing**
  - One day each for vendors and Caltrain
  - Measured maximum throughput, range, etc. of each proposer's solution
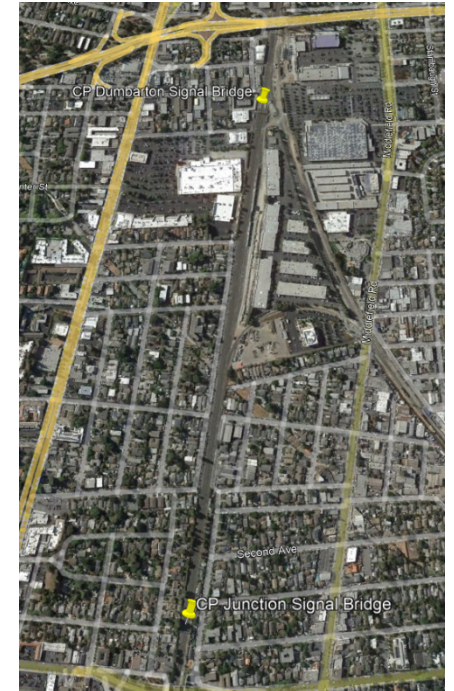
Summary – Next Steps

- **Goals to be met**
  - Create a wireless train to wayside communication link for various uses by Caltrain and its passengers – that does not currently exist on Caltrain

  - Leverage Caltrain's existing fiber network along our right-of-way

  - Identify a clear roadmap with the ability to leverage technical advancements

- **Next Steps**
  - Recommend a contract award for Board consideration in September 2022
  - Implement Project to correspond to commencement of EMU service

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Questions?

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FOR MORE INFORMATION

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