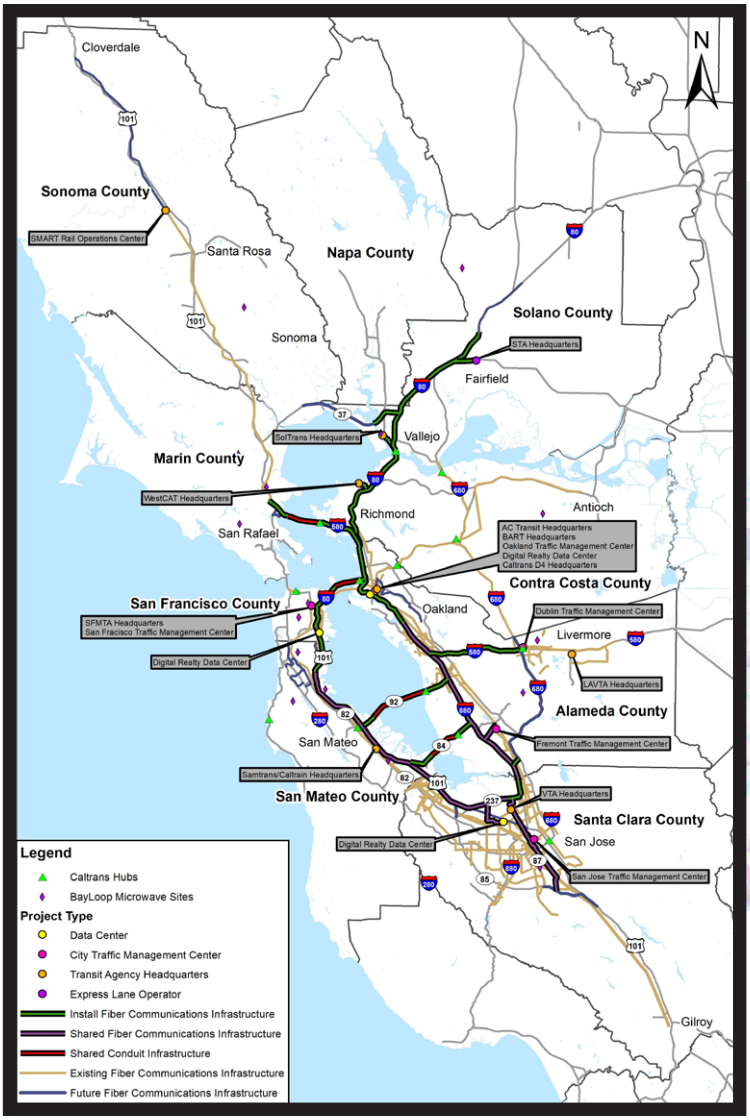
# REGIONAL COMMUNICATION STRATEGIC INVESTMENT PLAN

**EXECUTIVE SUMMARY**
**JULY 2019**

DRAFT

## VISION

*To provide the technical and policy framework to develop a fast, reliable, redundant, and cost-effective regional communications network that will enable the sharing of data, infrastructure, and maintenance costs among project partners; support coordinated and interoperable transportation systems across multiple jurisdictions; and facilitate technology-based strategies focused on enhancing safety, mobility, livability and economic vitality of communities throughout the nine-county San Francisco Bay Area.*




## PROJECT BACKGROUND

This Bay Area Regional Communications Strategic Investment Plan provides a framework to enable MTC, Caltrans, and other regional and local stakeholders to develop a regional communications network. The Plan proposes **40 projects**, prioritizes them based on their benefits and costs, describes traditional and creative funding sources, and outlines best practices for sharing communications infrastructure. Vision, goals, and objectives developed by project stakeholders guided the Plan's development.

The Plan lays a roadmap that will result in a regional communications network. This network will enable data and information sharing and facilitate the implementation of technology-based congestion management strategies focused on enhancing the livability and economic vitality of communities through the nine-county Bay Area. It will give agencies the ability to support managed lanes, ICM, Smart Cities, and other emerging, advanced technologies.

## BENEFITS

This Plan highlights benefits of a regional communications network at a regional and local level. A shared regional communications network would result in long-term cost savings by leveraging investments made in existing infrastructure and eliminating monthly recurring leased line costs. Other benefits include but are not limited to: decreased reliance on a single communications system owned by one agency, increased coverage and capacity, and enhanced redundancy.

Potential use cases of the regional communications network include but are not limited to: synchronized traffic signals across jurisdictions to enable better traffic flow, shared video feeds to monitor real time traffic conditions and make congestion mitigation decisions, and having regional control of traffic systems to respond and adjust signal timing in the event of an emergency or natural disaster.

METROPOLITAN TRANSPORTATION COMMISSION

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## PROJECT SELECTION

Based on the Plan objectives, the following project types were proposed: completing the regional communications backbone around the Bay and connecting Points-of-Presence (POPs), express lanes, and transportation centers to the regional communications network.

The **40 proposed** projects can be categorized as sharing existing communications infrastructure or installing new ones. For projects that propose sharing existing infrastructure, a draft sharing agreement was developed to facilitate negotiations between agencies. For projects proposing installation of new infrastructure, fiber was found to be the most appropriate technology. Projects were prioritized based on the availability of existing/planned infrastructure along their route, ease of construction, estimated project cost, congestion, and the level of coordination with partner agencies required. Based on these criteria, the following projects were identified to be complete within next five years as Phase 1 of the regional communications network:

### PHASE 1 - TOTAL COST = $9 MILLION

1. VTA/Caltrans to dedicate fiber strands installed as part of the planned SR 237 Express Lane project and the planned US 101 Express Lane Project for regional communications purposes
2. C/CAG/Caltrans to dedicate fiber strands installed as part of the planned San Mateo US 101 Managed Lanes Project for regional communications purposes
3. BAIFA/Caltrans to dedicate existing fiber strands along I-880 from Hegenberger Road to Dixon Landing Road
4. Caltrans to make existing conduit infrastructure available for regional communications purposes along I-80 from Yerba Buena Island to Bay Bridge Toll Plaza

## COST ANALYSIS

Planning level cost estimates were developed for the proposed projects. Preliminary project cost estimates are $149 Million, which is inclusive of capital construction, right-of-way, hub equipment, traffic control, miscellaneous construction, systems integration, and recurring operation and maintenance costs over 25 years.

A return on investment calculation was completed to compare the cost of leased wireless and fiber communications infrastructure. Bandwidth demands of typical technologies currently deployed along freeways were compared to future bandwidth needs necessary to accommodate emerging technologies such as connected/autonomous vehicles and vehicle occupancy detectors. The return on investment for fiber communications infrastructure installation drops from 30 years to 15 years when comparing existing to future bandwidth demands. While end equipment is constantly getting updated, a built out fiber network will likely still be necessary to provide reliable communications in decades to come.

The Plan identifies potential funding sources for the proposed projects. Funding types include traditional public funding, and innovative financing options such as loan programs and public-private partnership opportunities.

## RECOMMENDATIONS

To facilitate the build out of the regional communications network, the following tools were developed:

- A draft sharing agreement, based on research of local and national sharing agreements, to facilitate negotiations between agencies.
- A flow chart of technical recommendations for incorporating communications infrastructure into project design. At a minimum, it is recommended that the regional communications network infrastructure includes 12 strands of fiber, 1-4” conduit, and Caltrans No. 6E pull boxes. Pull boxes should have 200’ maximum spacing along arterials and 200’-800’ spacing along freeways, with 500’ recommended. Project sponsors are recommended to consider installation of communications infrastructure throughout all phases of project development.

To mainstream the deployment of fiber communications, the following policies are recommended:

- Smart Dig policy: Requiring agencies to install fiber communications infrastructure if their project limits overlap with a proposed project proposed in the Plan. The FCC contends that the cost per mile for fiber deployment increases roughly 42% when it is not jointly deployed.
- Communications Infrastructure Funding Policy: Projects proposed for programming in the 2020 RTIP and beyond, when project limits overlap with a proposed project in the Regional Communications Infrastructure Strategic Investment Plan, seeking funds for environmental or plans, specifications, and estimates (PS&E) phases, should consider incorporating communications infrastructure into project design.

The details of day-to-day regional communications network management and funding are to be determined. Detailed design parameters (e.g. infrastructure security, throughout as-built documentation, pull box spacing) will be defined as each project moves into implementation. Many proposed projects include agencies sharing infrastructure. For those situations, it is important to develop asset protection and maintenance guidelines to protect investments.

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