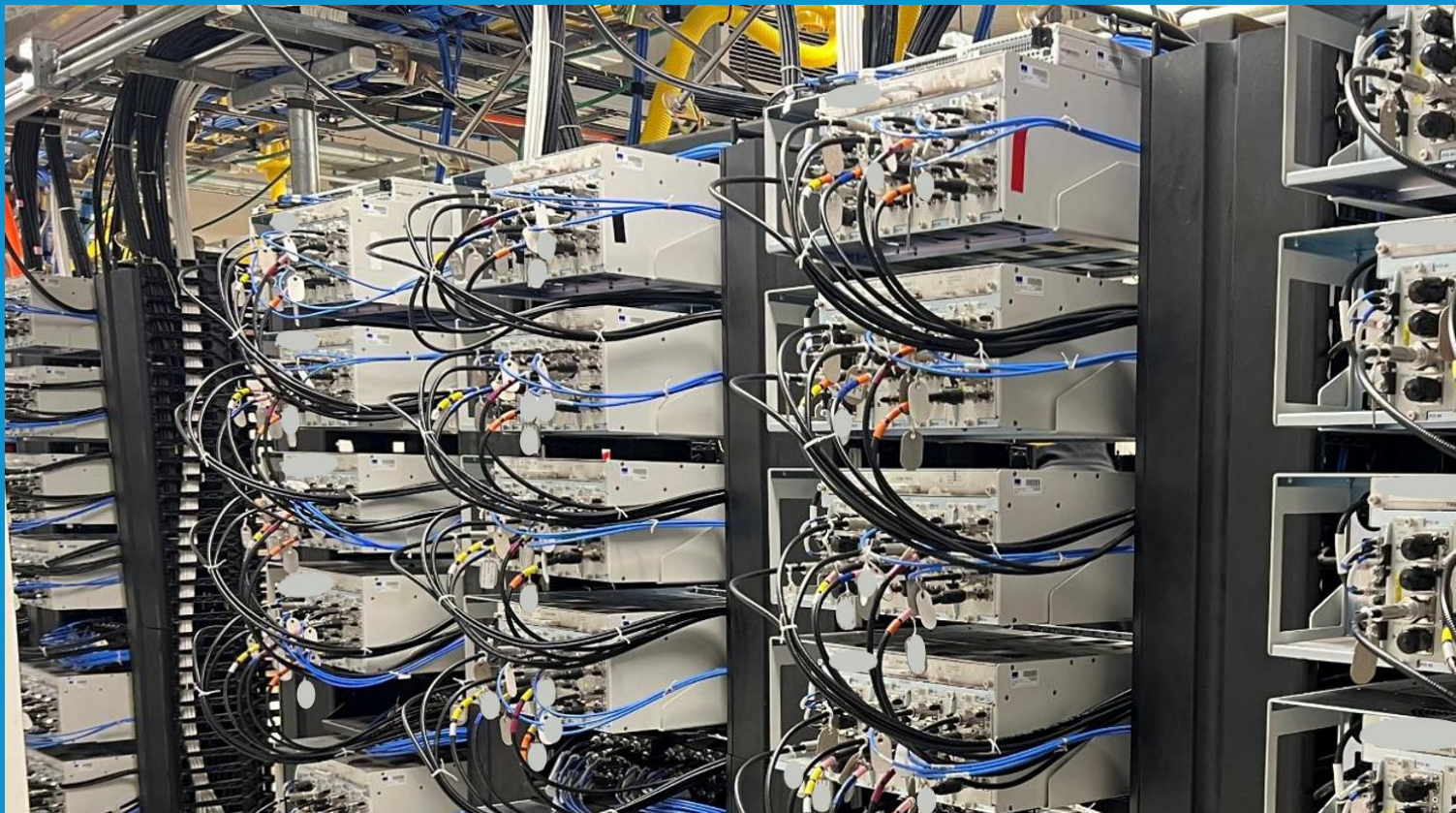




▶ Operational Technology Topology Modernization (OTTM)

For Action: BART Board, August 13, 2026

Follow-up from the October 23, 2025, Board Meeting



- Following up on our **October 23, 2025**, Presentation to the Board on the Network Disruptions from September 5, 2025
- Discuss the progress we've made thus far, and the present our plan for a **More Resilient Network Design**, for your consideration.

▶ Delivering on our Commitments



Near-Term

- ✓ • Reduce risk of network storms
- ✓ • Minimize dependency on Spanning Tree Protocol (STP)
- ✓ • Standardize network traffic flow
- ✓ • Repair single-leg fiber breaks on two Unified Optical Network (UON) rings
- ✓ • Establish a network operational baseline and verified **Stability Report**

Mid-Term

- ✓ • Expand redundant network paths.
- ✓ • Establish a modern Border Gateway Protocol (BGP) plan for datacenters and stations.
- ✓ • Document future topology with verifiable failover functionality.

Longer-Term

- ✓ • Define and enforce network design standards:
 - Uptime: **99.999%**
 - Recovery Time Objective (RTO). **<500ms**
- ✓ • Lifecycle Management Plan
- Network Monitoring
- Logging Implementation Report

▶ Since our last update



NETWORK STABILIZATION & RESILIENCE

212

Wayside Stabilization Events Completed

Targeted repairs and modifications have successfully stabilized the existing network infrastructure.

11



Consecutive Months Without a Network Storm

Improved oversight and stabilization efforts have prevented major network disruptions and disasters.

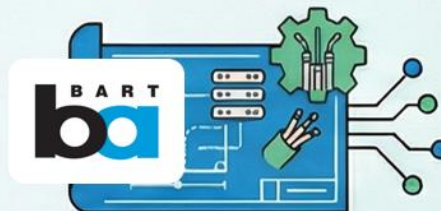
4x Avoided



Network Resiliency Assessment (NRA) Finalized

Completed logical architecture reviews and physical audits of 16 key stations.

MODERNIZATION & STRATEGIC GROWTH



Comprehensive Modernization Plan Completed

Finalized strategies for interim routing, future fiber redundancy, and hardware requirements.



Competitive Hardware Bidding Initiated

Bids solicited from industry leaders including Cisco, Arista, HPE/Juniper, and Ciena/Siemens.

GOVERNANCE FRAMEWORKS



Change Management Process

Draft Phase



Configuration Control Board

Draft Phase



Network Stability Plan

Draft Phase

3x Hired

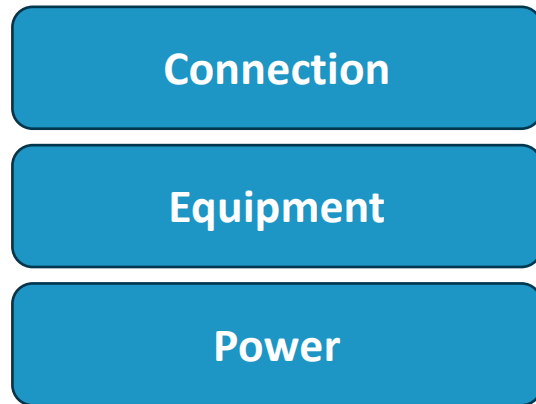
100+

Applicants for Key Engineering Roles

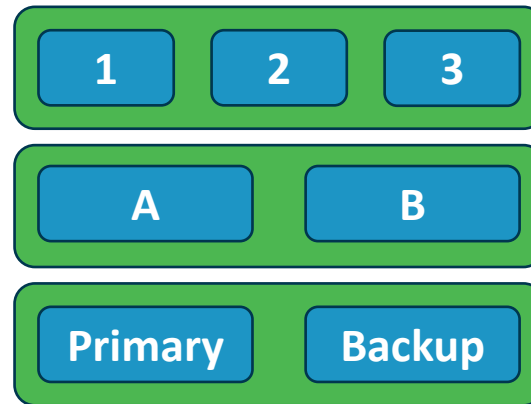
High interest in Principal Cyber Security and Network Engineer positions to support growth.



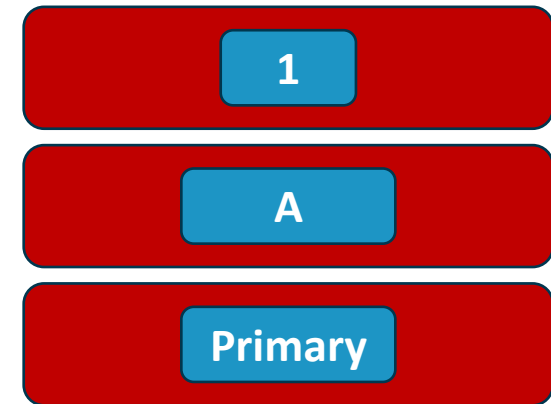
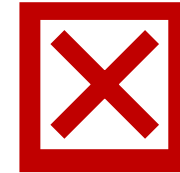
▶ Resilient Connectivity



All networks require 3 basic things, **Power**, **Equipment**, and a **Connection**.

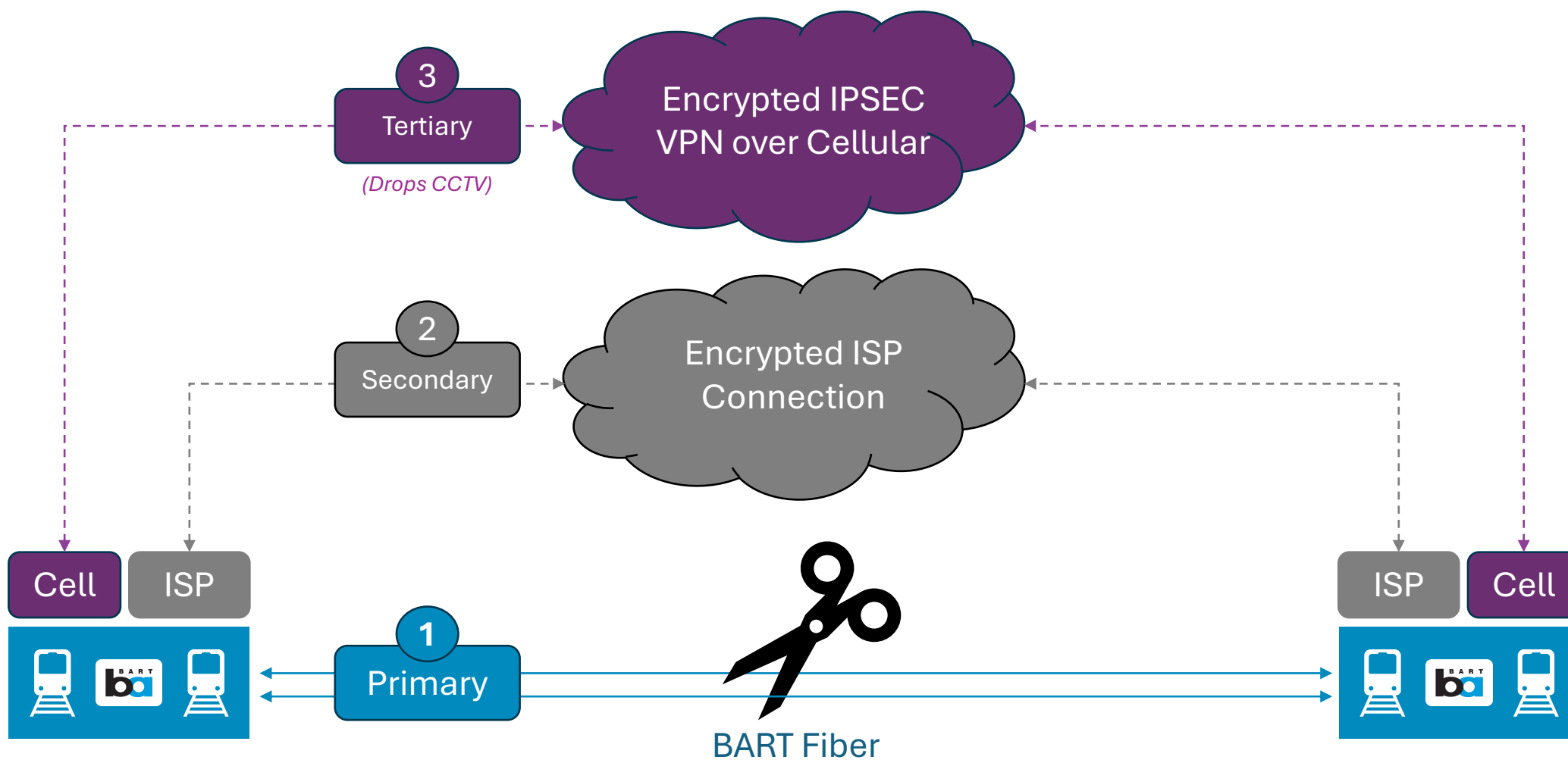


A resilient network has **multiple of each** to ensure constant connectivity.



Our audit uncovered that nearly all **facilities were lacking redundancy** in at least one area.

▶ Redundant Communication Paths

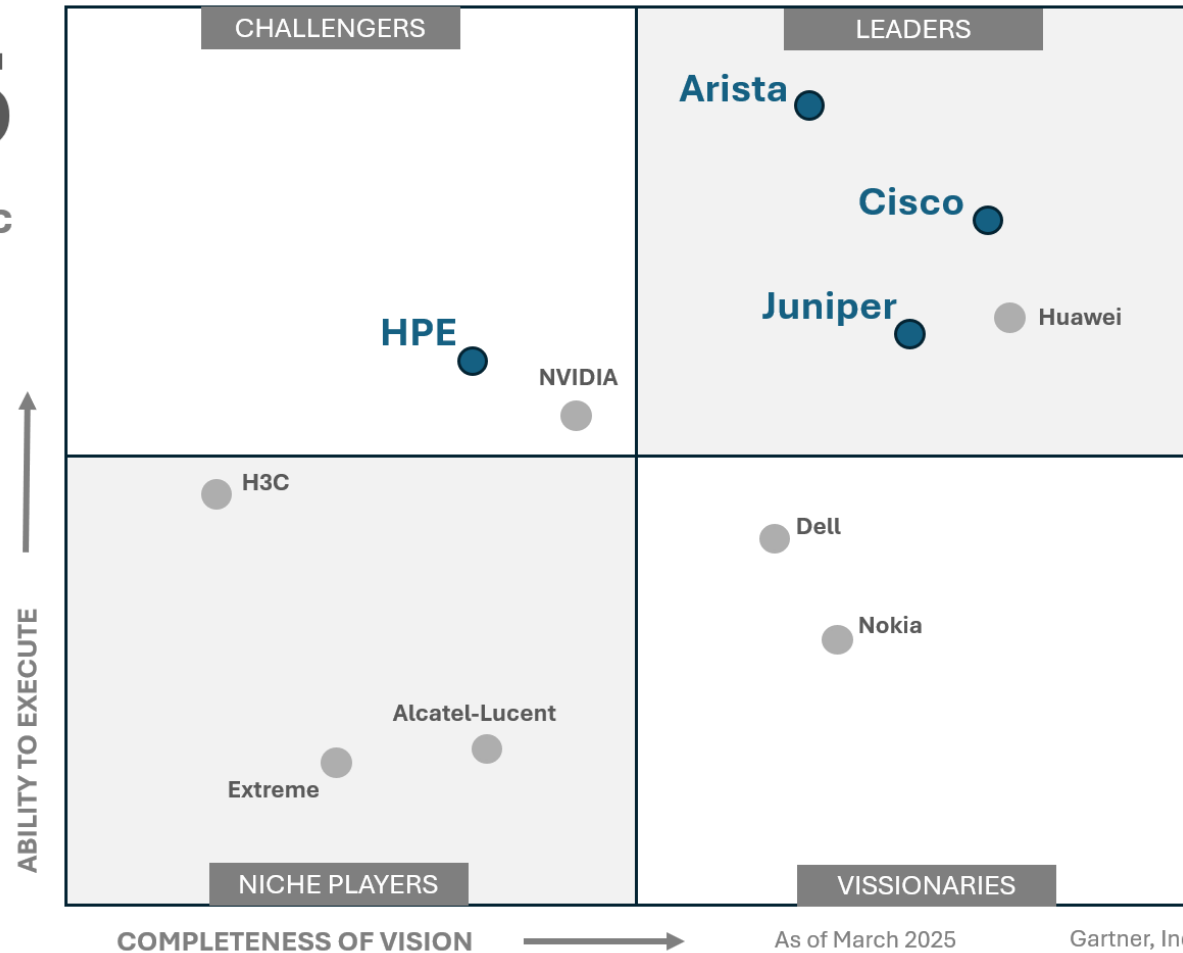


Modern Competitive Analysis



2025

Gartner Magic
Quadrant



Data
Center
Switching

As of March 2025

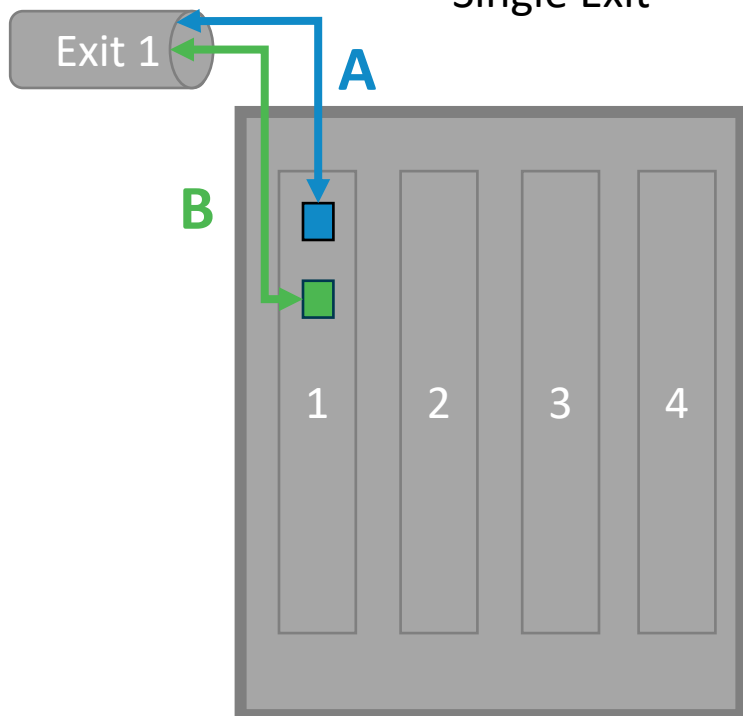
Gartner, Inc.

▶ Upgrading our Network Resiliency



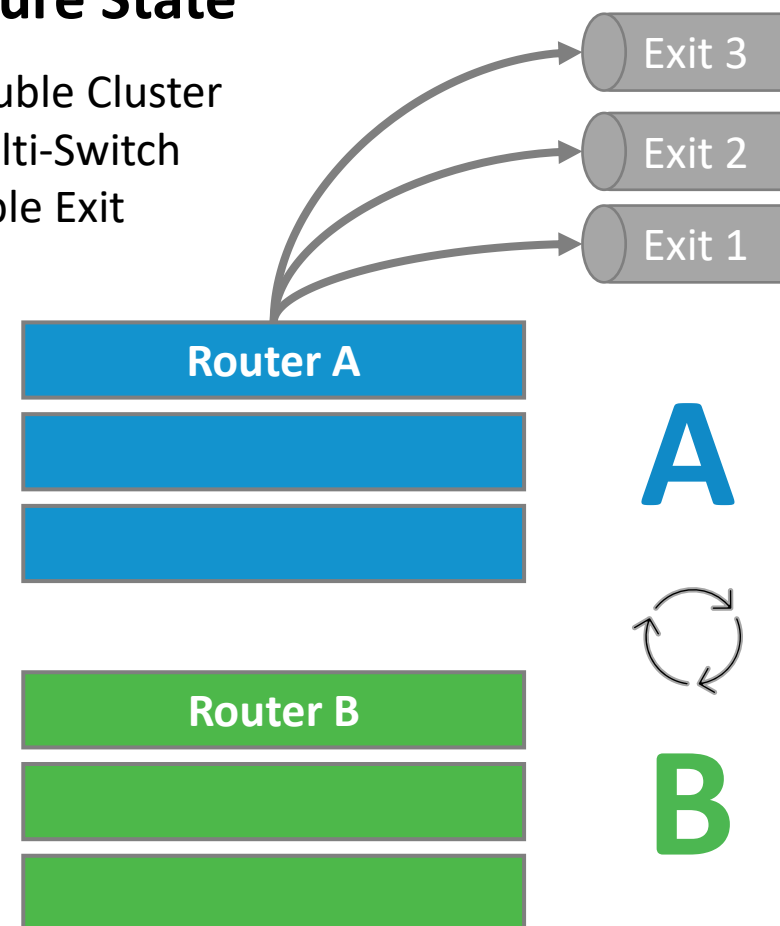
Current State

- Single Chassis
- Single Blade
- Single Exit



Future State

- Double Cluster
- Multi-Switch
- Triple Exit



Measured Improvements



Future Racks Will Be Less Expensive

58% Reduction in Price, and 3x the Reliability

Existing Network
Cost per Station

Future Network
Cost per Station

*Trains can still run after
cable vandalism*

Automatic Failover

*Ability to service one
cluster while the other
one runs*

\$650k

- \$375k
↓

*Equipment weighs less,
and is easier to transport
and install*

*Ability to replace
equipment with Zero-
Downtime*

*Uniform Training &
Inventory*

\$275K

▶ Scope Summary

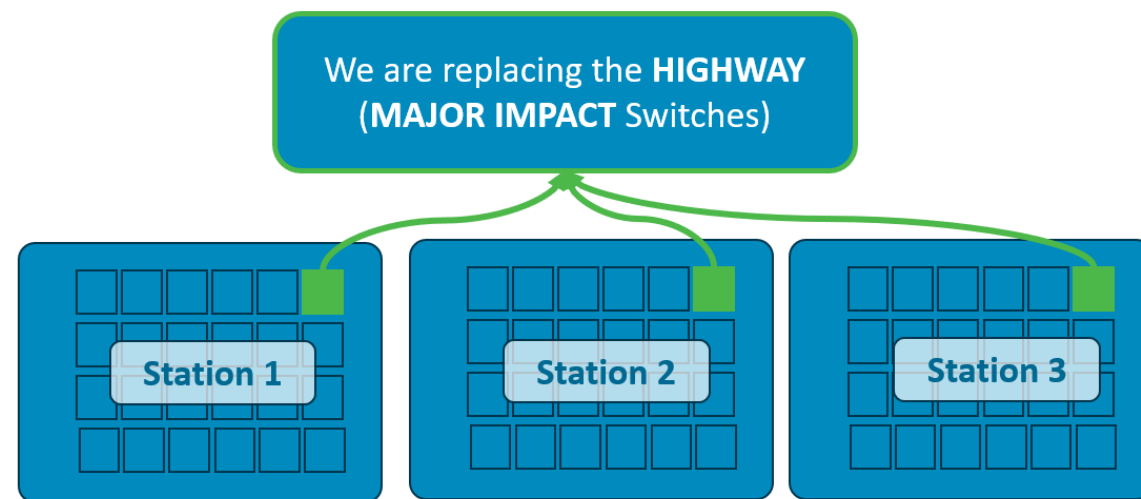


- Equipment
- Services
- Training
- Software & Support
- Next Day Replacement
- Testing & Assurance



- We are replacing the communications backbone, the **HIGHWAY**, for many of our mission-critical systems, including:

- Legacy Train Control,
- Fare Collection,
- Operations Control Center (OCC),
- Supervisory Control and Data Acquisition (SCADA),
- Radio Communications,
- Public Address Systems,
- CCTV Surveillance,
- Maintenance Facilities, and more



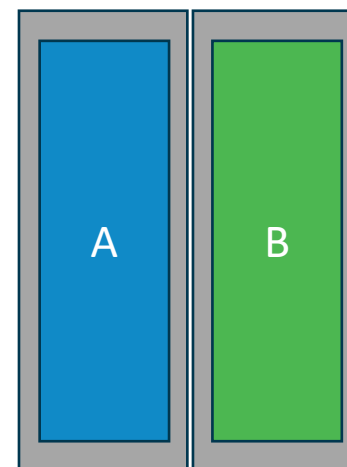
There will still be **850 LIMITED IMPACT** Switches, worth ~\$17M. Many of these will be replaced by the State of Good Repair, Train Control Modernization, or other Capital Projects. However, many will remain in service for now, and need replacement in the future.

A District-Wide Deployment



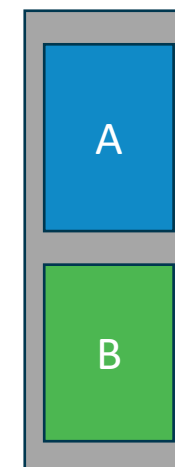
2

Datacenter Double Racks



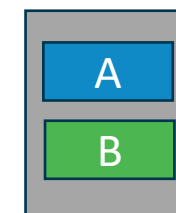
63

Facility Single Racks



135

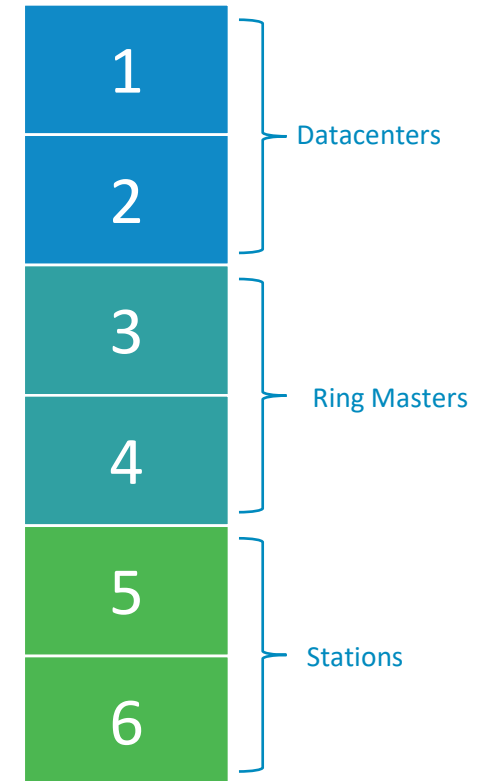
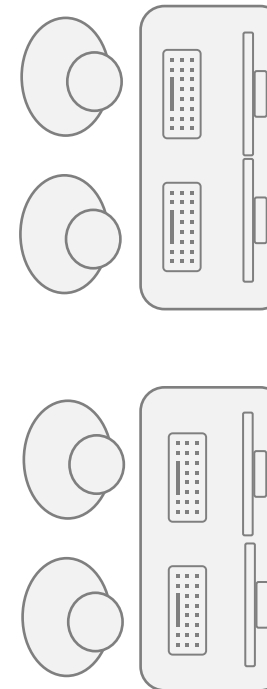
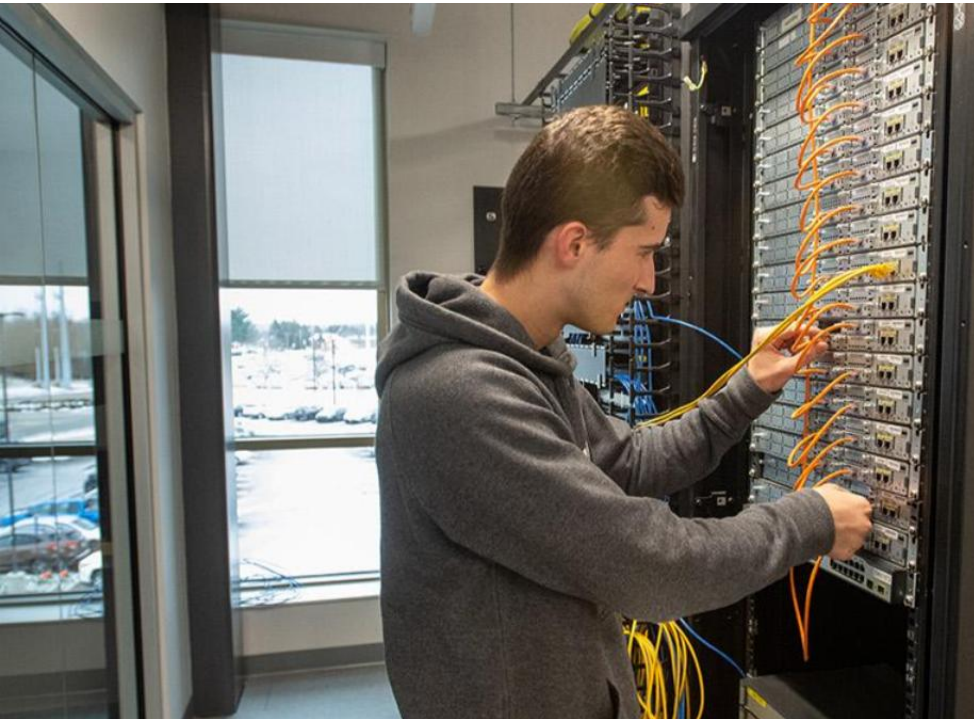
Wayside Half Racks



▶ New Training Facility



- We will be installing a Network Training Room.
- **Custom Courses. Unlimited Online Training for Staff.** Rack & Stack Equipment, Practice Maintenance Procedures, Advanced Troubleshooting, Emergency Drills, Pre-Deployment Testing



▶ NEW Pre-Positioned Fiber Optic Cable



Under the District's **Digital Railway Agreement with Boldyn Networks**, each time Boldyn installs new fiber optic cable to support its licensed public telecommunications services, it simultaneously installs an additional **72 strands of dedicated fiber optic cable for BART's exclusive use**.

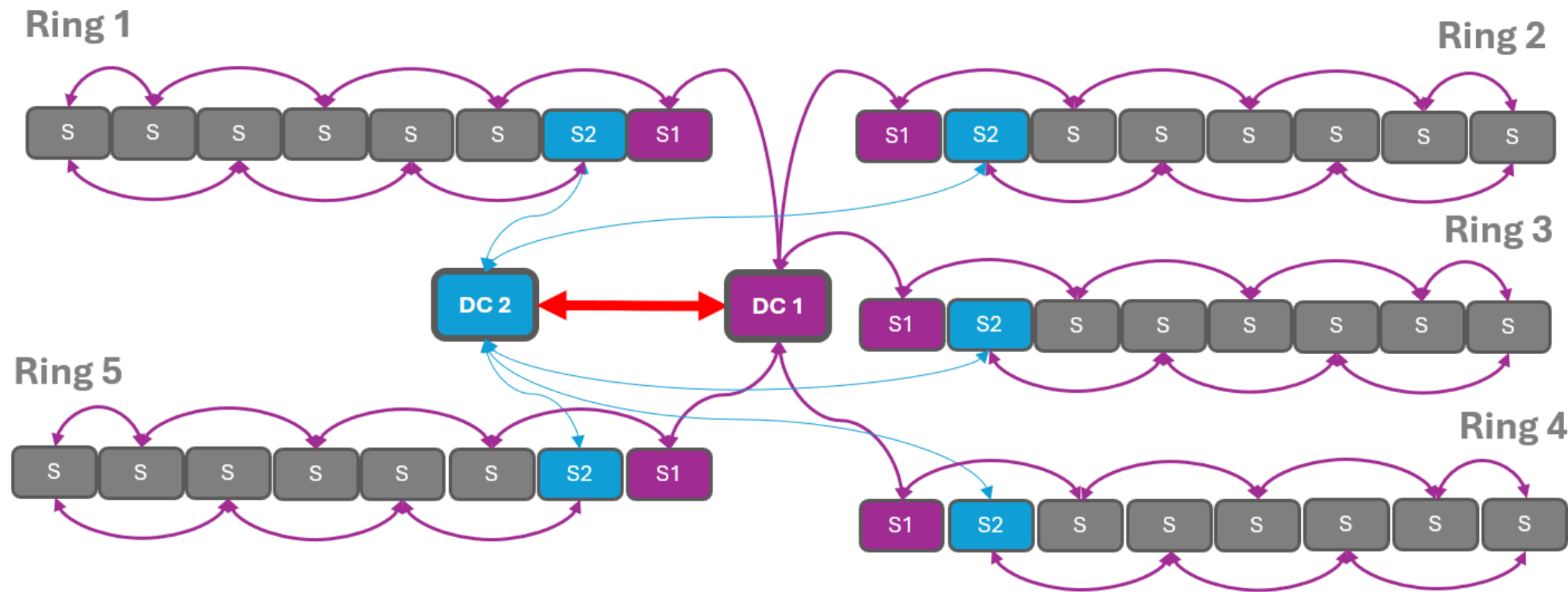
This negotiated clause has expanded the District's fiber infrastructure without any direct installation costs to BART while supporting our future operational initiatives.

This is a \$30M Value

No cost to BART

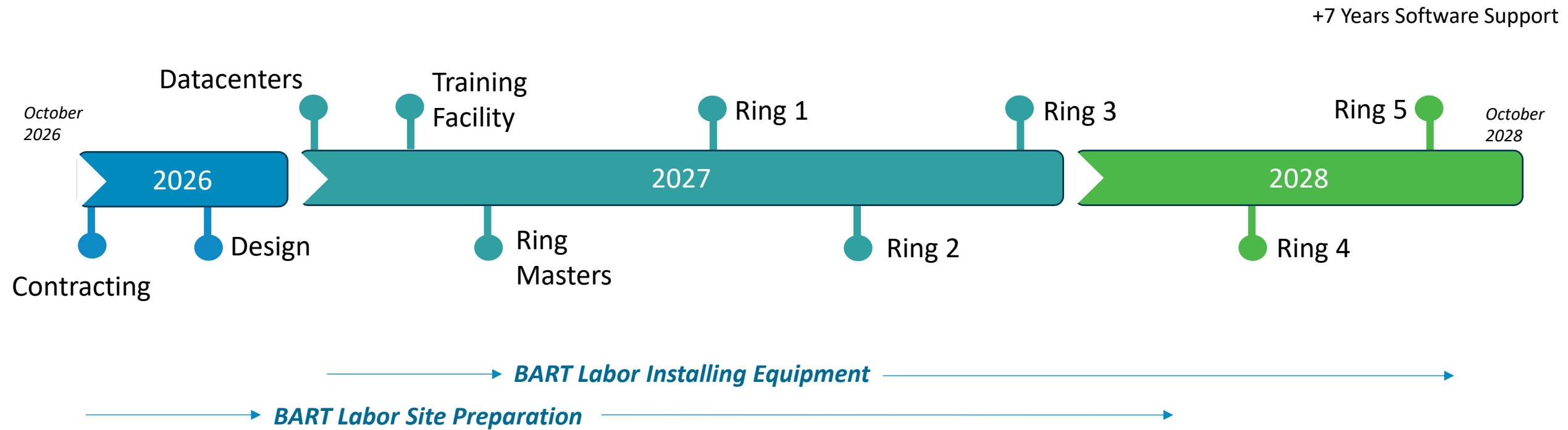


Redundant Datacenter Connections



- 2 Pairs (4 Strands) of BART Fiber (a) & (b)
- 2 Pairs (4 Strands) of BART Fiber (a) & (b)
- 10 Pairs (20 Strands) of BART Fiber (a) & (b)
- DC 1 "Primary Ring Master"
- DC 2 "Secondary Ring Master"

Implementation Schedule (24 Months)



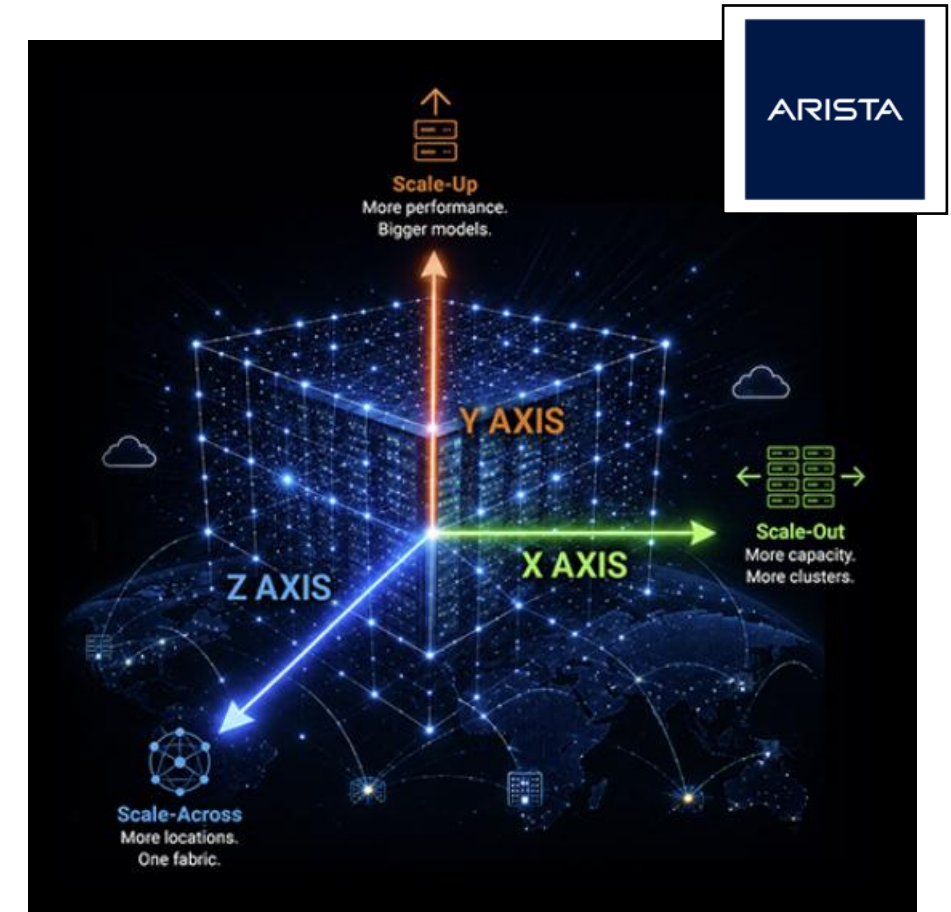
▶ Hardware Selected: Arista



The District has 10 years of experience using Arista products on our ADMIN and Police networks.

Arista's forward-facing design, advanced software management platform, and flexibility, finished #1 in our technical review.

Arista is the market leader in high-speed (greater than 10-gigabit) ethernet switching. Arista has large deployments for major hyperscalers like **Meta** and **Microsoft**. Transit deployments in **LA Metro**, **MARTA**, **Canadian National (CN) Railway**, and **New South Wales (NSW)** in Australia.



▶ Local Logistics: Livermore, CA



All racks will arrive at BART pre-assembled, tested, labeled and entered into our Inventory System, IBM Maximo – for long-term life cycle management.

***Computacenter**, a world-wide Datacenter service firm, will use their local 100,000 ft² integration center in **Livermore, CA** to assemble and store our equipment, delivering each rack as a ready-made component for BART forces to install.*



- The General Manager or his designee is authorized to enter into an Agreement for the Operational Technology Topology Modernization (OTTM) solution from Transource, in an amount not to exceed **\$22,091,052**.

▶ Questions

