

Success Story



Santa Clara Valley Transportation Authority

Allied Telesis solution modernizes foundational network for
community transportation payment system



the **solution** : the **network**

The Challenge

New Transit Fare Payment System Demands Updated Network Solution to Improve Operational Efficiency and Scale With Future Increases in Ridership



Serving the high-tech capital of Silicon Valley, the mission of the Santa Clara Valley Transportation Authority (VTA) is to provide sustainable, accessible, community-focused transportation options such as bus, light rail, and paratransit services to more than 42 million California riders a year.

VTA is also responsible for transportation planning, congestion management, and design and construction of select highway, pedestrian, and bicycle improvement projects throughout the state's Santa Clara County.

In early 2011, VTA launched the initial phase of accepting the use of Clipper® cards as valid fare on its buses and light rail systems. Clipper is a reloadable, contactless smart card used for electronic transit fare payment in California's San Francisco Bay Area. The implementation of this new system would ease rider commutes by allowing them to transfer between transit systems with the swipe of a card—no need to stop again at a ticket vending machine or scramble for exact change.

With 625,000 active Clipper cards already in circulation, this newly integrated technology would require a more streamlined, reliable solution for connectivity of Clipper card kiosks and card scanning devices. With 42.2 miles of VTA railway tracks connecting riders to Bay Area Rapid Transit (BART), Caltrain, Amtrak, and Altamont Corridor Express (ACE) services, train platforms needed to be fitted with a reliable and scalable core-to-edge network solution to support this new, modern payment system and accommodate projected increases in ridership.



A number of challenges needed to be overcome in the legacy system. A common issue faced by older systems stemmed from stopgap fixes and ad hoc hardware additions that, over time, resulted in a network comprised of disparate equipment types, manufactured by numerous vendors. In addition, there was only sparse documentation for the legacy network, which increased the complexity and time required to troubleshoot problems. Moreover, the unmanaged media converters being used in lieu of switched infrastructure restricted network visibility and growth—preventing VTA from identifying the root cause of an issue or expanding the size of the network. Unable to foresee connectivity breakages or equipment failures, personnel had little control over the true state of the network. Therefore, correcting issues in the network was extremely time-consuming, required deployment of expensive resources, and potentially impacted riders.

The Answer

Allied Telesis and VTA Collaborate, Delivering Future Proof, Core-to-Edge Network Design

In order to prepare for the Clipper card roll-out, VTA began evaluating solutions to replace its legacy system. Unattended revenue collection machine manufacturer, VenTek International, recommended that VTA consult with Allied Telesis for its expertise in architecting modern network solutions. VTA selected Allied Telesis to help design and deploy a Clipper card network solution that not only met the rigorous requirements at launch, but could scale with ridership growth through the years.

In close collaboration with VTA, Allied Telesis performed a network health assessment, provided a set of recommendations, and delivered an implementation plan that would limit outages to a single machine at any given time. The resulting solution would deliver a resilient, scalable network for the organization's 62 light rail stations that would not only meet the rigorous needs of the Clipper card at launch, but also maximize and streamline VTA's long-term offerings as well.

“Allied Telesis provided the ideal mix of product, expertise, and training which was critical to the overall success of the Clipper card roll-out. The consultation and training they provided to VTA teams was instrumental in our ability to deploy, manage, and optimize our modern network solution for the long term.”

Richard Bertalan

**TECHNOLOGY MANAGER, SANTA CLARA VALLEY
TRANSPORTATION AUTHORITY**

Key reasons VTA selected Allied Telesis include:

- Allied Telesis worked closely with VTA to understand the challenges of the legacy system and offered a solution that would suit VTA's technical requirements, budget, and project timeline.
- Allied Telesis uniquely offered a ruggedized, resilient solution that was in lock step with rigorous requirements that come with outdoor installations.
- Allied Telesis staff served as an extension of the VTA technical team in order to meet critical deadlines and provide training to VTA personnel.

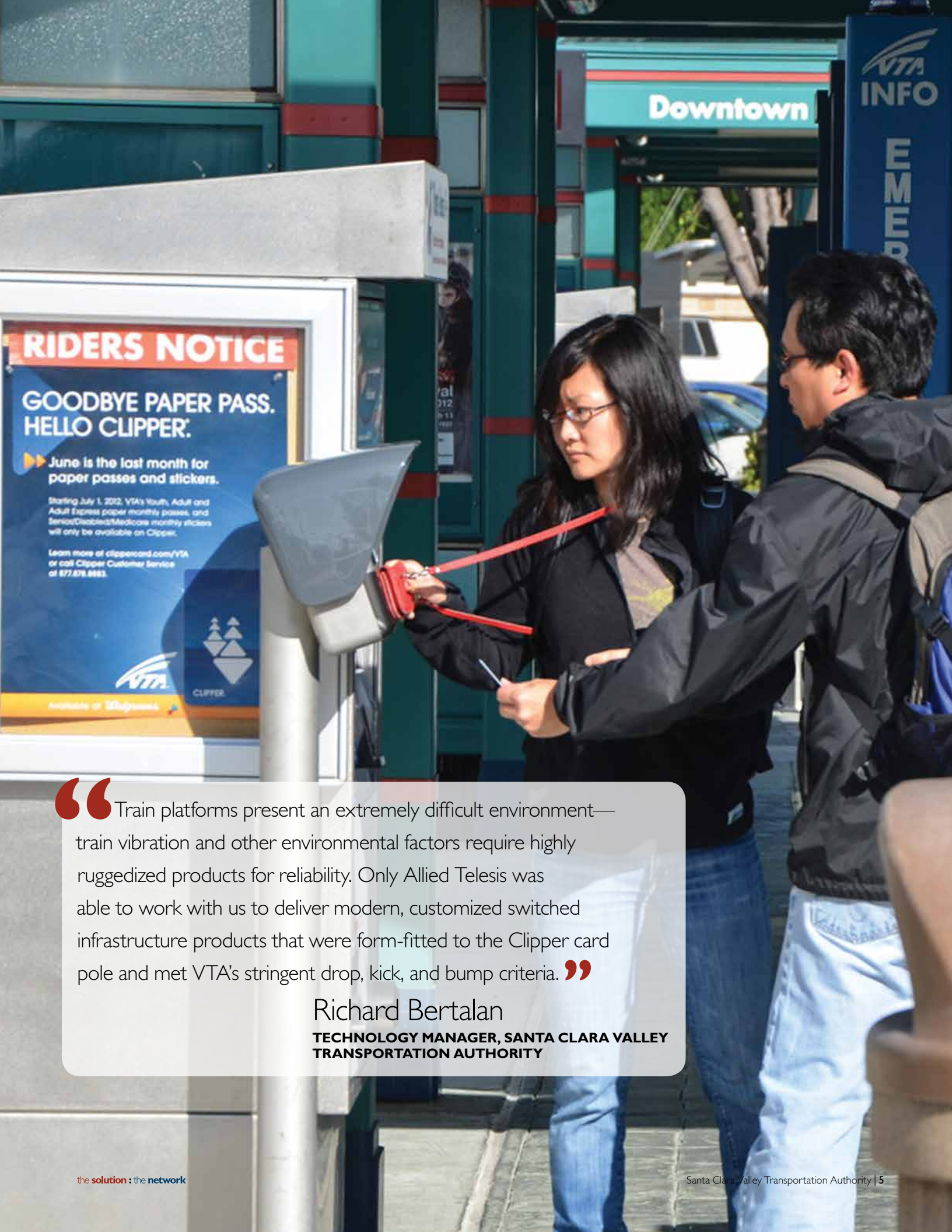
The Approach

In the legacy configuration, rings of fiber were looped from station to station, with each ring connected to a single switch. This switch was then connected to ticket machines via fiber and unmanaged media converters. In the new design, unmanaged media converters were replaced with Layer 2 managed Gigabit Ethernet switches at the station and Layer 2 ruggedized, extended temperature fast Ethernet managed switches at the edge.

Each loop now goes to one of two aggregation points, where there is an advanced Layer 3 switch. Nine different loops were created; each loop servicing up to seven train station platforms. This stackable configuration at the loop aggregation points allows the end of each fiber ring to connect to a separate stack member, resulting in increased resiliency and reliability.

The first installation of the core and aggregation network infrastructure was implemented jointly, allowing the Allied Telesis team to provide hands-on training to VTA. This partnership aided VTA personnel in troubleshooting user and technical issues as they arose, and left them better equipped with the tools and knowledge needed to successfully install the additional aggregation loops. Creating a loop to move from old to new, with minimal service outage—one Clipper pole at a time—maximized uptime for the ticketing system and minimized impacts to VTA riders.





RIDERS NOTICE

**GOODBYE PAPER PASS.
HELLO CLIPPER.**

▶ June is the last month for paper passes and stickers.

Starting July 1, 2012, VTA's Youth, Adult and Adult Express paper monthly passes, and Senior/Disabled/Medicare monthly stickers will only be available on Clipper.

Learn more at clippercard.com/VTA or call Clipper Customer Service at 877.679.6883.

Available on 

“Train platforms present an extremely difficult environment—train vibration and other environmental factors require highly ruggedized products for reliability. Only Allied Telesis was able to work with us to deliver modern, customized switched infrastructure products that were form-fitted to the Clipper card pole and met VTA’s stringent drop, kick, and bump criteria.”

Richard Bertalan

**TECHNOLOGY MANAGER, SANTA CLARA VALLEY
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The Results

Increased Reliability and Operational Efficiency and a Solid Foundation for Increased Rider Satisfaction and Future Growth

Before Clipper card, riders without monthly passes or other forms of prepaid fare would rush to ticket vending machines to collect single-use passes each time they transferred between transit systems, risking the ability to catch their desired train or bus. With Clipper card, VTA was able to successfully meet evolving consumer expectations around electronic and mobile payment options and provide a much better experience. Riders now transfer with ease at the swipe of a Clipper card; and with VTA's expanded capabilities, riders can reload their Clipper cards via onboard Wi-Fi.

In addition, the modern Allied Telesis network at the heart of the Clipper card system has set a solid foundation that will enable VTA to expand their offerings to include additional Clipper card kiosks, Wi-Fi onboard moving trains, VoIP emergency phones, and digital Real-Time Information signage and/or advertising—all services focused on enhancing customer satisfaction.

VTA's legacy system was difficult to document and lacked standardization. Over time, the addition of disparate equipment types, manufactured by numerous vendors, had taken its toll on operational efficiency, and made difficult and time consuming the tasks of isolating, troubleshooting, and resolving issues within the network.

Today, VTA no longer needs to dispatch a crew of technicians every time an issue arises. With the addition of modern, managed network products, a formally documented network infrastructure plan, and ongoing training and support, VTA has the visibility it needs to easily troubleshoot issues remotely and deploy valuable personnel and resources more efficiently, which has substantially increased the operational efficiency of this critical network.



Featured Products

A Purpose-Built Solution



AT-9000/28SP

GIGABIT MANAGED ECO-FRIENDLY SWITCH

For long haul station-to-station loops and shorter runs between Clipper card kiosks within stations. Mix of single and multimode fiber plus built-in copper ports, ideal for supporting multiple interfaces.



AT-8100L/8POE-E

RUGGEDIZED EXTENDED TEMPERATURE FAST ETHERNET SWITCH

Extended temperature fast Ethernet switch with small form factor is ideal for the Clipper card kiosk enclosure and was customized to meet VTA's stringent drop, kick, and bump criteria.



x900 Series

ADVANCED LAYER 3 SWITCHES

Stackable, modular, aggregation switch with high Gigabit uplink to the core supports various VTA interfaces with the ideal mix of port density to connect each side of the loop to a different switch in the stack. Redundant power delivers resiliency to prevent service outages.



SwitchBlade® x908

ADVANCED LAYER 3 CHASSIS-BASED MODULAR SWITCH

The SwitchBlade modular chassis connects dual aggregation switches at VTA's primary and data recovery centers. This approach enabled Allied Telesis to efficiently configure the needed interfaces.



AT-AR-770S

SECURE GIGABIT VPN ROUTER

The AT-770S modular firewall router provides secure, reliable traffic filtering and controls between the station loop network LANs and internal enterprise networks.

About Allied Telesis, Inc.

Founded in Japan and with offices worldwide, Allied Telesis is a leading provider of networking infrastructure and flexible, interoperable network solutions. The Company provides reliable video, voice, and data network solutions to clients in multiple markets including government, healthcare, defense, education, retail, hospitality, and network service providers.

Allied Telesis is committed to innovating the way in which services and applications are delivered and managed, resulting in increased value and lower operating costs.

Visit us online at alliedtelesis.com.



the **solution** : the **network**

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