



## Cisco – Supporting Fleet Optimisation through Powerful Networks and Visibility Opening

Many transit fleet operators are either investigating or already working towards modernising their fleets to improve efficiency, safety, predictability and passenger experience or to address climate change concerns... but the pace of change is governed by available funding and many transit agencies, who are operating financially in the red, have consequently been limited in what they can accomplish.

However, the Infrastructure Investment and Jobs Act (IIJA) in the US is a game changer and, along with other funding initiatives globally aiming to restore flagging transit ridership, is providing a huge infusion of capital to invest in electric buses and infrastructure upgrades for transit agencies to jump start their modernisation initiatives.

However, more must be done to define critical needs and appropriate solutions. One need is common across all transit agencies – an insatiable need for data (most in real time, some aggregated) in a secure manner to optimise operations and build a culture of on-time performance that benefits the entire ecosystem.

And the critical element in securing and reliably delivering data that is often overlooked is the network connectivity and operational visibility to the many systems on the vehicle, at the station and in

the yard. Cisco recognises this and provides best-in-class secure network connectivity via industrial routers like the IR1800 series, switches like the IE32/33/3400, and access points like the IW9167, along with layered security solutions like ISE, CyberVision, and Umbrella.

Additionally, with a targeted management tool for deployment, monitoring and overseeing maintenance activities, the Cisco IoT Operations Dashboard monitors transit systems and provides needed visibility for critical business applications and operations.

But first, let's look at the big picture.

### The Big Picture

Efficiency. Passenger experience. Safety. These are some of the keys to operating a successful transit fleet.

The most common way transit fleet operators meet these needs

include leveraging information from vehicle telematics systems, real-time vehicle location, remotely connected devices in the vehicle and sensors. These devices and sensors are the 'eyes and ears' of the transit operation providing real-time insights into every aspect of the transit vehicle, capturing the movement of people between buses and stations, detecting/flagging physical security risks and providing services and information to create a great passenger experience.

Some of the primary devices/sensors included are:

- Computer-aided dispatch and automatic vehicle location (CAD/AVL)
  - Manage route and real-time location information so dispatchers can see if the bus is on time, ahead or behind schedule, critical to a positive passenger experience

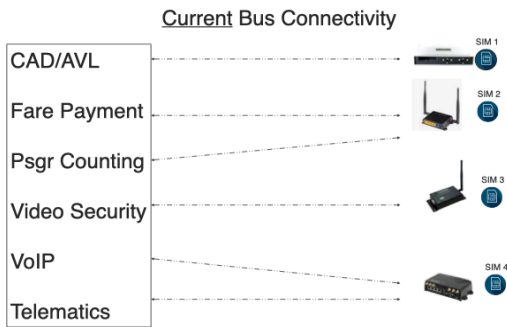


Figure 1

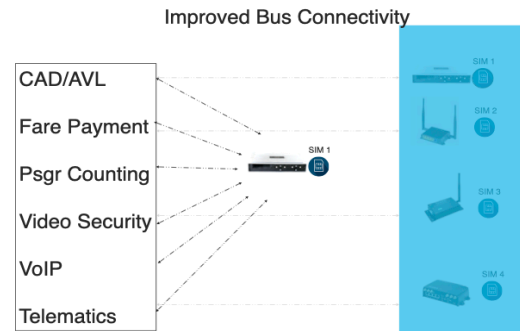


Figure 2

- Vehicle telematics
  - Monitor vehicle parameters such as engine temperature, oil pressure, emissions, fuel economy, etc. in support of predictive maintenance, critical to improved operations as well as safety
- Fare collection systems for plastic card or mobile payment
  - These support the revenue intake side of the business
- Passenger counting
  - Useful for route capacity planning and complying with pandemic-related occupancy restrictions
  - Allows passengers to choose whether to take the next bus or a later, less crowded service
- IP security cameras (on vehicle and at stations)
  - Capturing video on the bus and detecting events at the station is important to increasing passenger safety
  - Capturing passenger movements both on the bus and in stations is important to understanding usage patterns
- Voice communications between the driver and dispatch centre
  - Some things simply can't be communicated except by voice

- Wi-Fi Access Point
  - Built into the IR1800 industrial router
  - Enhances passenger experience and provides free Wi-Fi to all riders
  - Provides for bulk video data transfer and software updates in the station

### So, What's the Problem?

That all sounds great, doesn't it? But the operational gains from all of the connected devices and associated data can be stifled without a properly designed solution.

Consider Figure 1 which represents a piecemeal deployment approach:

The challenges presented by this approach include:

- Multiple management tools/ screens
- Lack of consistent (or difficult to manage) security policies
- Unable to see entire picture of network and device status in one place
- High maintenance and installation costs – antenna farm
- Required management of multiple SIMs

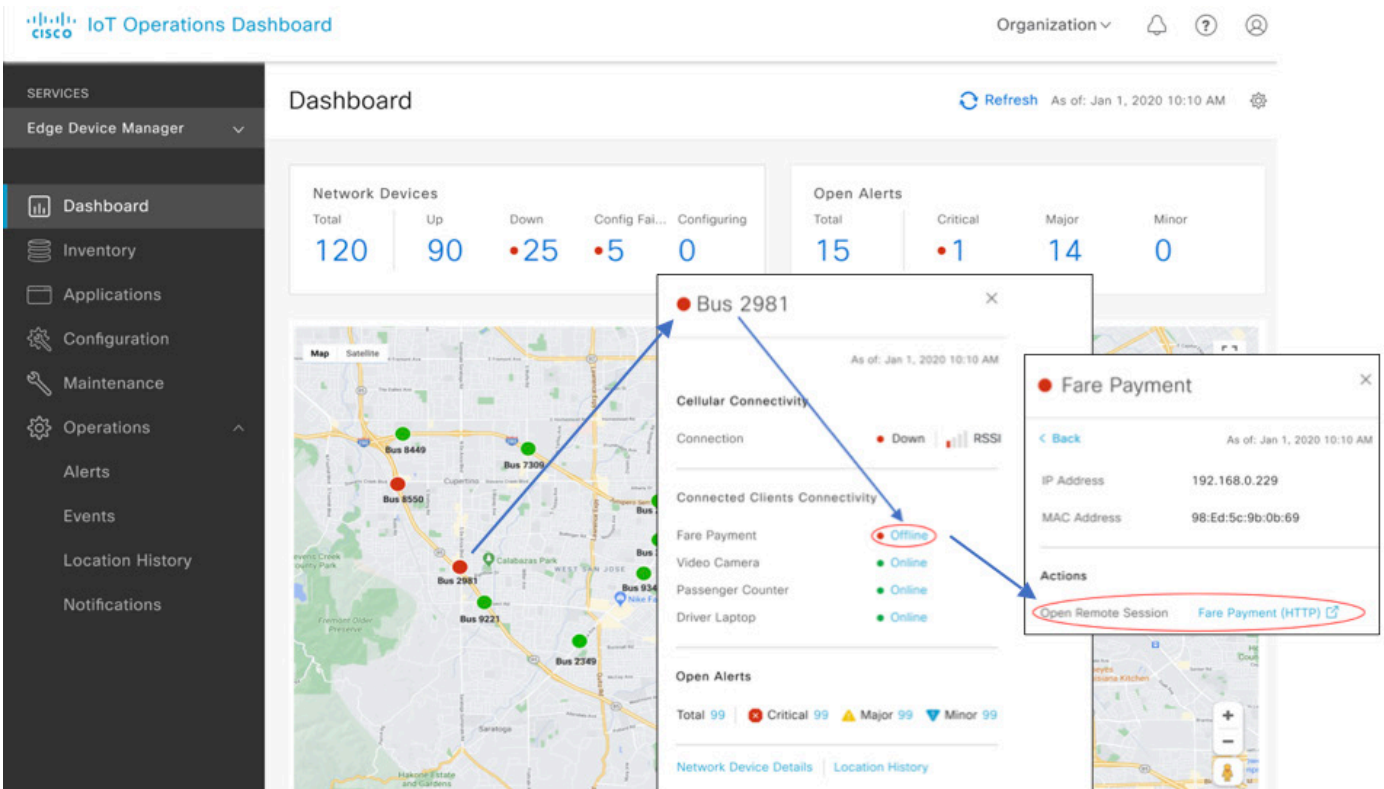
### The Solution

Then, look at Figure 2 which represents a unified deployment approach:

Advantages of the unified approach include:

- Unified management – single pane of glass
- Consistent security policies and administration
- Ability to see entire picture of network and device status and quickly troubleshoot
- Reduced maintenance costs, installation costs and power budgets
- Single or, at most, two SIMs to manage with reduced airtime costs

By consolidating, either fully or partially, and moving away from piecemeal solutions, fleet operations can benefit from simplified management, greater visibility, improved security implementation and lower maintenance and run time costs. This brings ease of use with consistency... a welcome combination! Of course, the vehicle router must have the capability to support the connectivity and security demands. The Cisco IR1800 series industrial routers provide the robustness, flexibility,



scale, security and performance required. They support dual LTE/5G, dual band Wi-Fi-6e, multiple PoE switch ports, high throughput, Cisco multi-layer security and edge application hosting in a ruggedised transportation-ready form factor.

## Introducing IoT Operations Dashboard

The other key piece of the puzzle for optimising operations is having an operational management tool that provides the deployment, monitoring/alarms and troubleshooting capabilities needed to keep fleets running and reduce costly failures that inflict pain on operations and passengers.

Visibility is key! When the vehicle telematics system or CAD/AVL or fare collection system or security cameras fail (and they will), you must have immediate visibility to

rapidly respond and minimise the impact. Moreover, the ability to detect and fix some issues without having to take a vehicle out of service is worth its weight in gold.

With Cisco's IoT Operations Dashboard fleet operators can quickly be alerted to a detected problem, assess the source and fix problems with connected equipment. It's a modular cloud service with a simple user interface to help operations teams view important data about the health and operational status of connected equipment and sensors, using an IR1800 industrial router.

In the figure above, each dot represents a uniquely named transit bus with an IR1800 series router on board. A red dot indicates that one of the connected devices on the bus is malfunctioning. One click shows which system has the problem – say, an offline fare payment system. With an additional click, the

operator can learn about the status of the connected devices on the bus as well as the router.

With one more click the operator can learn more about the failing device and open a secure remote session to that device from their browser, using one of several industry standard protocols, to diagnose the problem or view the device details – a fast solution to many problems.

Quick, easy visibility and problem resolution. A powerful combination.

## Summary

As you address your fleet modernisation programme, consider efficiency, passenger experience and safety – some of your top priorities. Let Cisco help you achieve them with the winning combination of the IR1800 series industrial router and IoT Operations Dashboard.