ENTERPRISES IN MOTION

In a world where traditional tethers to the central office have all but vanished, enterprises that operate vehicle fleets require constant and dependable mobile Internet connectivity to keep up. Businesses, organizations, and public agencies with vehicle fleets find productivity gains and improved fleet management by deploying dependable mobile connectivity in vehicles. Additionally, travelers and mass transit commuters now expect constant connectivity, and not just through their mobile phones.

3G/4G/LTE wireless networking enables businesses, agencies, and transportation providers to:

- Offer courtesy Wi-Fi to their customers
- Communicate through digital signage
- Access databases securely from the road
- Leverage real-time intelligence to manage vehicle resources
- Troubleshoot, manage and monitor security

For mobile enterprises that can't afford downtime, 3G and 4G Internet solutions are a reliable, secure, and cost-effective means to ensure that when every minute counts, the connection is dependable.

Of course, transportation presents unique connectivity challenges when compared to a traditional office environment. Traveling along bumpy roads, traversing service areas, and powering devices using a vehicle battery are factors requiring special considerations and planning. A total solution should take into account all aspects of virtual and physical layouts, as well as anticipated usage. You'll find that you're not simply choosing hardware and a data plan, but rather looking holistically at how to optimize a comprehensive solution for reliable, stable connectivity on the road.

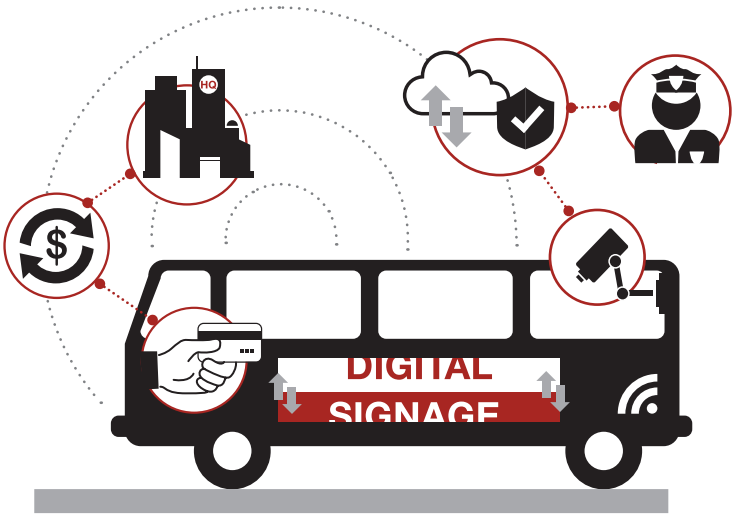
IN-VEHICLE CONNECTIVITY: HOW IT'S USED

1 Real-time Updates and Remote Management

Mobile service enterprises deploy 3G and 4G Internet in fleet vehicles to handle data entry and billing on-site, update inventory in real time, and print receipts immediately. Additionally, GPS tracking gives businesses the ability to monitor stops, watch for redundancies and wasted mileage, and recognize safe drivers—all from a remote location using cloud-based software. Most importantly, when implemented strategically, these seemingly small productivity boosts yield substantial ROI.

2 Video Streaming and Digital Signage

With constant mobile connectivity, vehicles can deploy digital signage that can be configured, scheduled, and updated from a remote location. For enterprises and agencies with security concerns, video streaming capability offers the advantage of real-time video surveillance, making it possible to monitor security from a remote location and alert authorities immediately when problems arise.

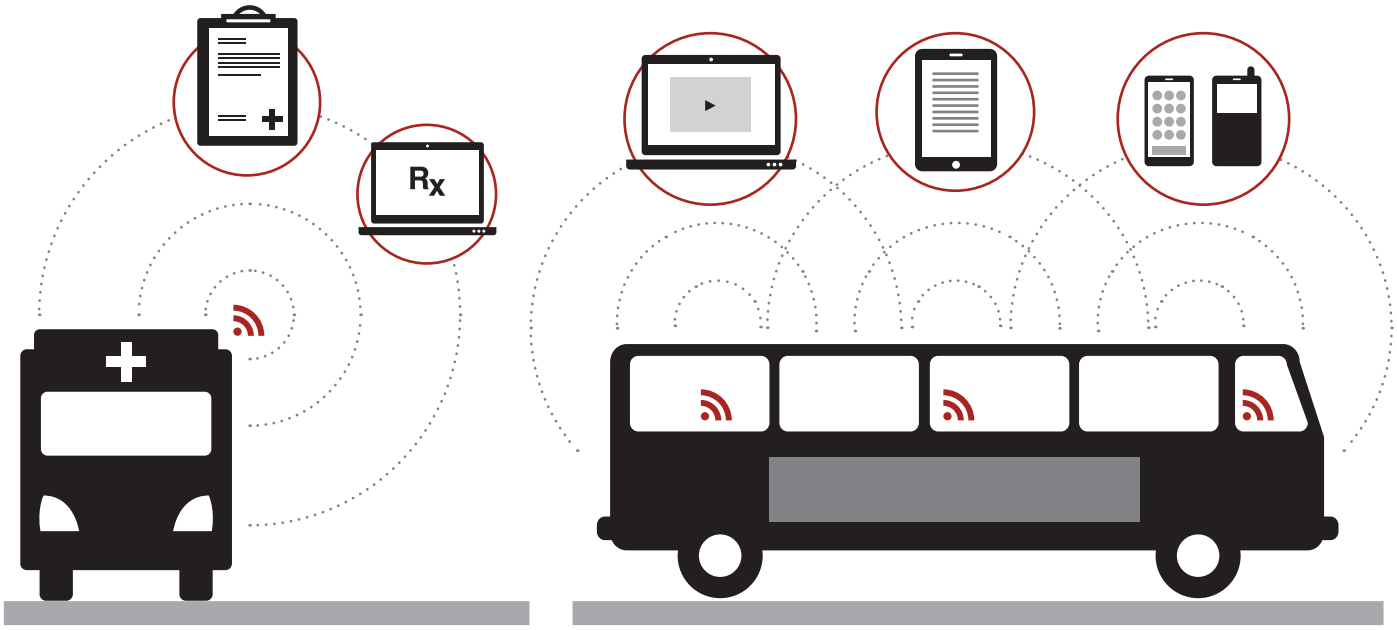


3 Remote Database Access: Secure and Efficient

First responders and emergency services use mission-critical mobile connectivity to monitor, analyze, and diagnose patients on the road. Paramedics can look up vital information and update records immediately, while law enforcement officers use secure connectivity to check driver licenses and vehicle registrations and file digital incident reports in real time.

4 Wi-Fi for Passengers

Today's transit commuters and leisure travelers want connectivity almost as much as they want a seat and an on-time arrival. In fact, a recent study found that more than 50% of mass transit commuters anticipated using Wi-Fi during their commute. Transportation providers that offer guest Wi-Fi enhance the rider experience and offer commuters heightened productivity, while blocking undesirable content and managing bandwidth usage.



CHALLENGES AND BEST PRACTICES

Decision makers should move strategically when incorporating mobile connectivity in conveyances, anticipating challenges, following industry best practices, and choosing solutions that will yield consistent, significant ROI.

A professional, experienced "partner ecosystem" or portfolio of partners is usually required, as few organizations can plan, deploy, manage, and scale mobile Internet on their own. The partner ecosystem will analyze, propose, and implement complete solutions that address the physical and virtual layout for each specific case.

Remote monitoring, maintenance, and updates

Challenge: For optimal operation, wireless routers require regular software and firmware updates, configuration, maintenance, and troubleshooting. Many businesses, however, are logistically unable to dock their fleet several times a week in a centralized location in order to install updates, fix issues, or transfer data.

Solution: Cloud-based remote management software can enable software/firmware updates, configurations, security patches, and maintenance of wireless devices from a remote location while ensuring that sensitive data stays safe.

Wiring and electrical issues

Challenge: Mobile routers use the vehicle's battery as a power source, but the device can drain battery voltage in cars and buses, causing brownout or blackout when the vehicle starts, eventually ruining the router.

Solution: Identifying the ideal power conditioner or voltage regulator that controls vehicle and device power is critical, as such devices are needed to protect the router from "dirty" power (varying voltage signals). This ensures that both the vehicle and the router stay safe, particularly when starting the vehicle, and that the battery is not drained when the vehicle is shut off.

Placement

Challenge: Reliable connectivity depends on correct placement of the mobile router and antennae, and placement needs will differ based on the vehicle, terrain, and connectivity expectations. Vehicles transporting many users will require multiple routers to serve high-volume needs.

Solution: It is vital that routers are installed with an understanding of the physical and virtual barriers that may negatively affect or even sever connectivity. Each router should be correctly placed and installed for maximum connectivity, and the number of devices needed to best serve passengers must be calculated based on anticipated usage.

Extreme temperatures

Challenge: Weather conditions and temperature fluctuations can impact sensitive router hardware in detrimental ways. When vehicles operate in extreme heat or cold, the mobile router can be irreparably damaged. Even normal weather conditions such as sunshine streaming through glass windows on a summer day can heat a vehicle to the point of ruining these electronic devices.

Solution: Routers should be able to withstand extreme temperatures, both when the vehicle is in operation and when it is being stored. In order to hold up under extreme conditions, devices should be designed to endure temperatures between -20 degrees and 60 degrees Celsius.

Terrain

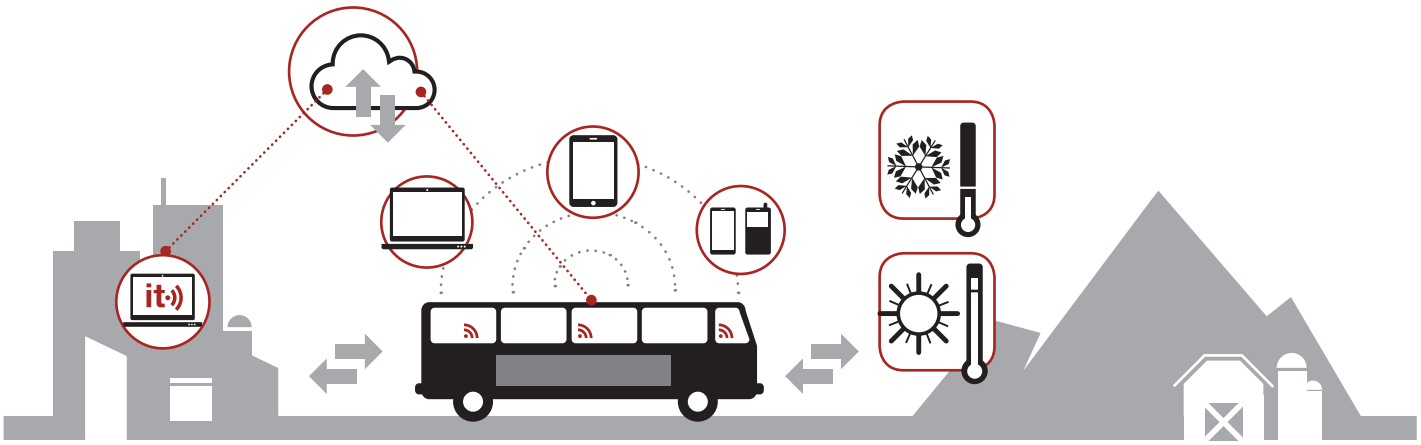
Challenge: From trains speeding down the track to school buses navigating bumpy rural roads, conveyances often experience high levels of vibration, and routers must be capable of withstanding rough terrain without coming loose from the vehicle or breaking.

Solution: Installation brackets should be designed to handle the roughest of terrains without coming unscrewed or breaking. Devices and installation solutions should be tested according to MIL STD 810G and SAE J1455 standards to ensure that routers are protected against bumpy roads.

Choosing a carrier

Challenge: With multiple carrier options available and a patchwork of service areas along any given route, choosing a 3G or 4G provider can be confusing.

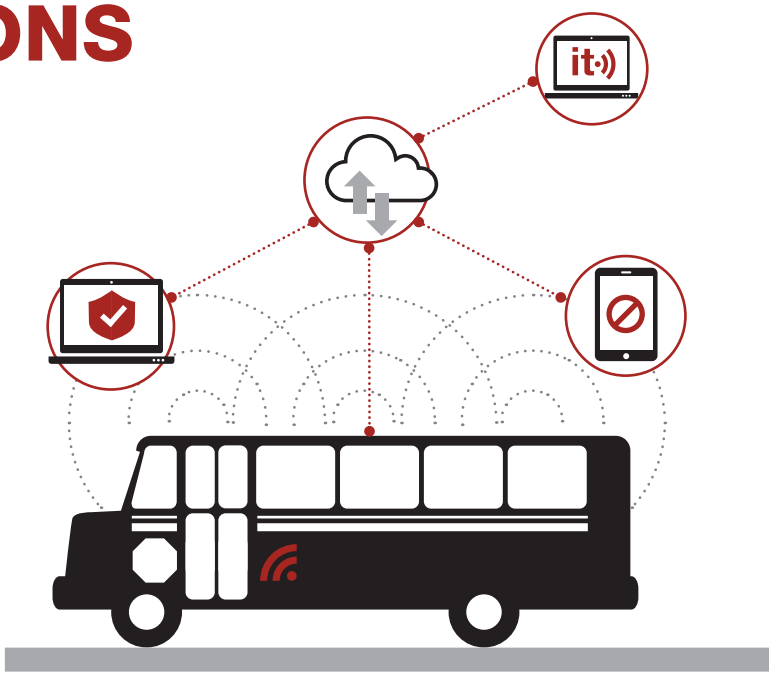
Solution: Unique reception needs should be studied and evaluated prior to choosing a carrier to ensure the proper plan and carrier for each situation, including an analysis of service and route maps and a test drive. A pre-sales site survey can be used to gather reception data for specific routes and help decision makers choose the best carrier for reliable coverage.



APPLICATION-SPECIFIC CONSIDERATIONS

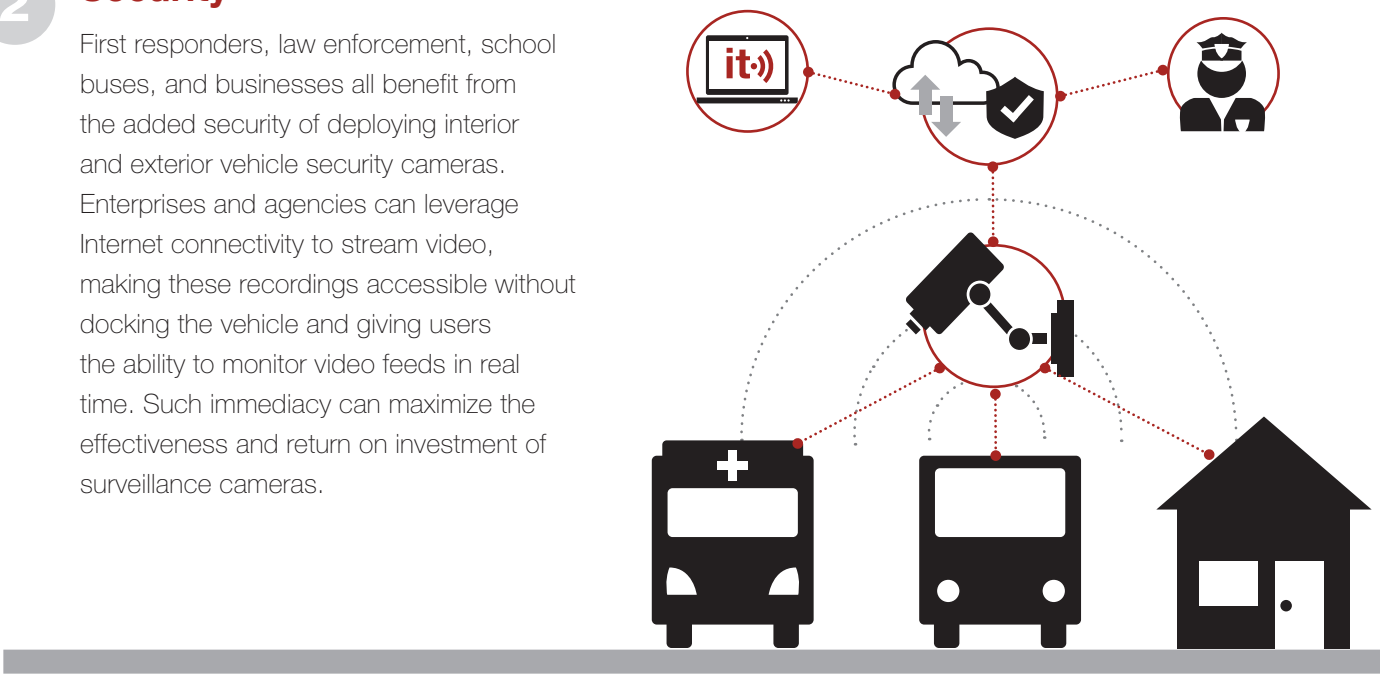
1 Education and mass transit

When the operators of conveyances offer Wi-Fi to passengers, the need for content filtering and the policies that govern such filtering invariably arise. Educational agencies can block sites not approved by school administration, while transit authorities may wish to prevent downloads, streaming, and inappropriate content. Cloud based software enables IT managers to customize content preferences and be alerted to security breaches immediately.



2 Security

First responders, law enforcement, school buses, and businesses all benefit from the added security of deploying interior and exterior vehicle security cameras. Enterprises and agencies can leverage Internet connectivity to stream video, making these recordings accessible without docking the vehicle and giving users the ability to monitor video feeds in real time. Such immediacy can maximize the effectiveness and return on investment of surveillance cameras.



3 Fleet management

Fleet enterprises can use software with integrated geofencing technology to track vehicle routes, stops and speed. This intelligence allows fleet managers to monitor route efficiency, look for redundancies or wasted time, and reconfigure routes for maximum effectiveness.

4 Services on-site and e-commerce

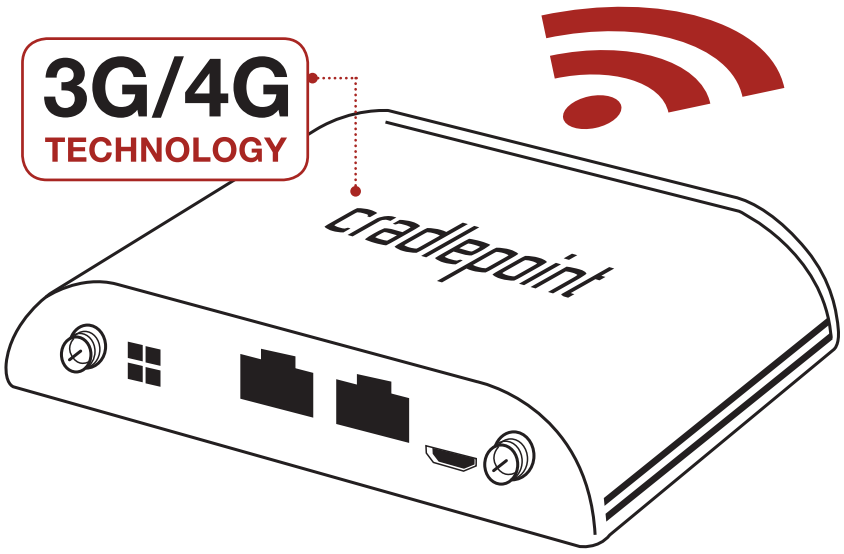
Businesses can leverage Internet connections to offer customers on-site payments and input data, while ensuring secure communication between devices. To protect customers and keep sensitive information secure, software with encrypted communication protocols safeguards against “eavesdropping” and other interventions.

CRADLEPOINT MOBILE 3G/4G ROUTING TECHNOLOGY

CradlePoint's COR Series has become a "go-to" solution for mobile Internet. Providing instant and reliable 3G or 4G connections for a multitude of applications, CradlePoint's COR Series is unlike other mobile 3G and 4G routers in the market. Large deployments of these devices can be managed using CradlePoint's Enterprise Cloud Manager software to monitor, configure, and upgrade geographically-dispersed systems without requiring on-site technical resources.

As the first to pioneer and fully enable high-speed LTE in our solutions, CradlePoint maximizes the potential of the cloud for businesses worldwide.

To learn more, visit CradlePoint.com or call 855.813.3385.



CradlePoint COR Features

- Multiple-network interoperability
- Fully Integrated Router/Bridge
- Integrated 4G LTE, HSPA+, and 3G EVDO Models
- Ruggedized Metal Housing, withstands temperatures between -30 and 70 degrees Celsius, compact size, and certified vibration mitigation
- External Modem and Wi-Fi Antennas

CASE STUDY: North Kansas City School Buses Add Wi-Fi

Challenge: It's one of the great tensions in the education world: the need for consistent time in the classroom vs. the rich experiences that only occur when learning takes place on the road: science field trips, hands-on vocational learning, debate competitions, band performances, etc. But whenever students travel on a bus, they lose valuable instructional time.

Solution: North Kansas City Schools implemented the CradlePoint COR IBR600 with integrated 4G LTE on four buses used for longer trips. With its small footprint, hardened case, embedded modem, and external antennas for improved signal, the CradlePoint COR is the ideal solution for buses.

Results: The CradlePoint solution meshed perfectly with other technologies implemented in the school district. Every high school student receives a MacBook Air with security features and Internet filters already integrated into the laptop. Only those district-issued devices can connect to the Wi-Fi on the buses, and everything on the network has to go through the district servers. Also, the buses are equipped with extra security features including video surveillance. "We feel comfortable that kids are not going to be able to access anything they shouldn't," said Lon Waterman, Assistant Director of Transportation.

CASE STUDY: Boise Police Department Implements Mobile Hotspots

Challenge: Every minute that police officers spend back at the station checking records and filing reports is a minute lost patrolling and protecting neighborhoods. And many mobile hotspot solutions are too fragile to stand up to an entire day of service in a patrol car, while others offer connection speeds too slow for the fast-paced needs of law enforcement.

Solution: Boise Police Department deployed the CradlePoint COR IBR600 Series in nearly its entire fleet of patrol vehicles. With its end-to-end offering, CradlePoint customized a solution to fit Boise Police Department's durability, security, and reliability needs.

Results: Boise Police officers update records and verify information without leaving their patrols, accessing vital files and databases while keeping sensitive data protected. With 4G LTE Internet speed, the connection is fast enough to let officers update records quickly and get back on the road without ever leaving their vehicles. "The performance is fantastic," says Boise Police Department Captain Eugene Smith. "My car is a better office than my office."