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Connected Vehicle Solutions

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INTERNET ON TRAINS – WHY ?

Passenger Wi-Fi

- Keep your customers - Enhance the value
- Sell more tickets - Attract new passengers from air, bus and car
- Make more money – Encourage upgrades
- Happier customers – Take away the sense of time

“The Wi-Fi is fantastic; I’m sitting here VPN’d into my corporate network and listening to MP3s streamed live from my home computer at the same time.”
A. Shutt
Standard Class Passenger, NXEC

Passenger Wi-Fi

Convert travel time to working time

Efficiency
Flexibility
Productivity

Passenger Wi-Fi

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Entertaining Hours

=

Short Hours

facebook

skype

YouTube

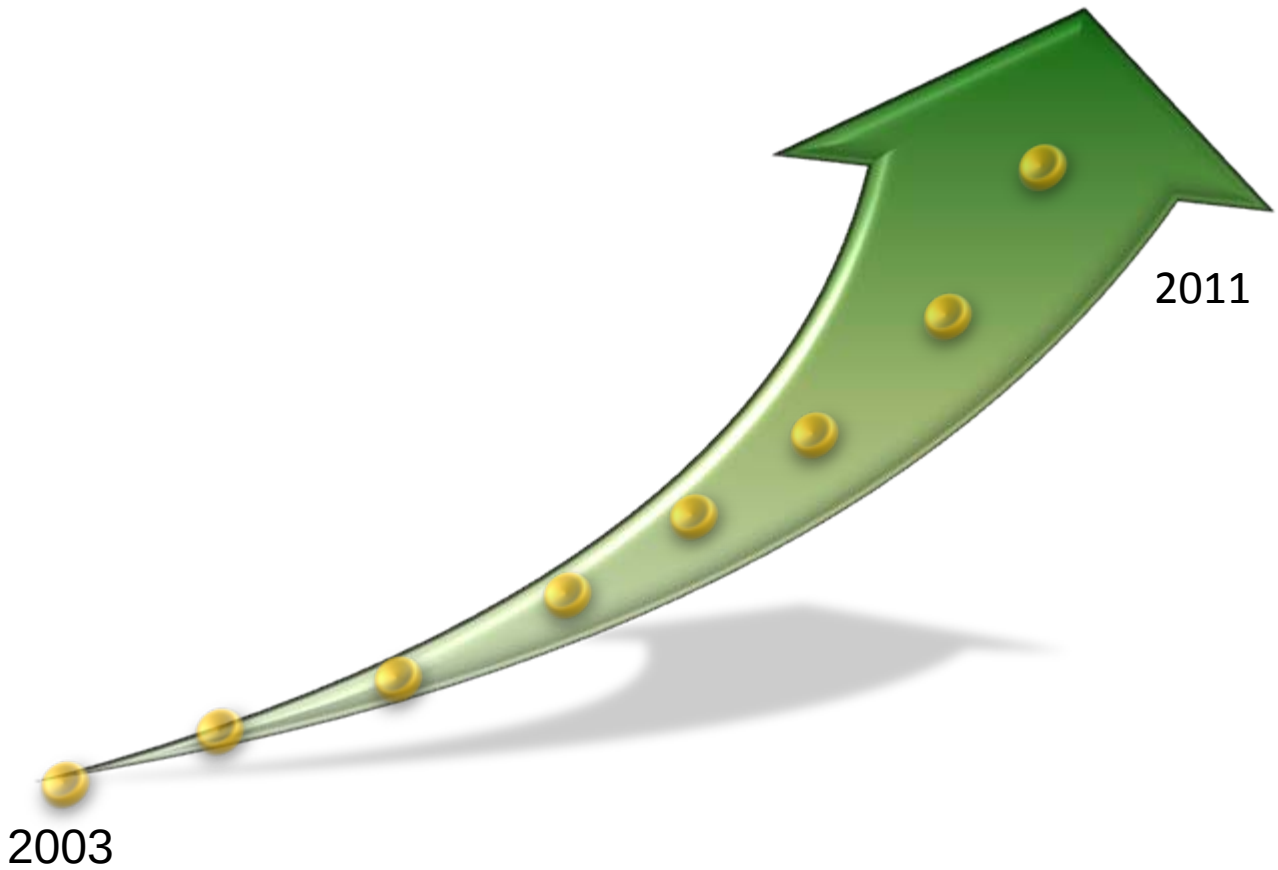
iTunes

UNIBET

Spotify

Gmail by Google

Usage of Wi-Fi for passengers



Business case for passenger Wi-Fi

When there are two competing lines (bus and rail) and one of the lines introduce internet for passengers there is typically a migration of 15-20% of the passengers to the line offering internet.

In most cases internet access is offered for free in buses and for first class rail customers. Second class typically pay for the service.

Business case for passenger Wi-Fi

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One of Icomeras customers charges for internet in second class, this pays for the whole investment and data fees.

- Assuming that the second class paying passengers generate 5 million in revenue.
- This generates another 15 million in revenue from passengers migrating from second class to first class.
- This generates another 80 million in revenue from passengers migrating from other means of transportation to rail.
- This means that 5 million in cost generates 100 million in revenue, a 20 to 1 return on investment every year.

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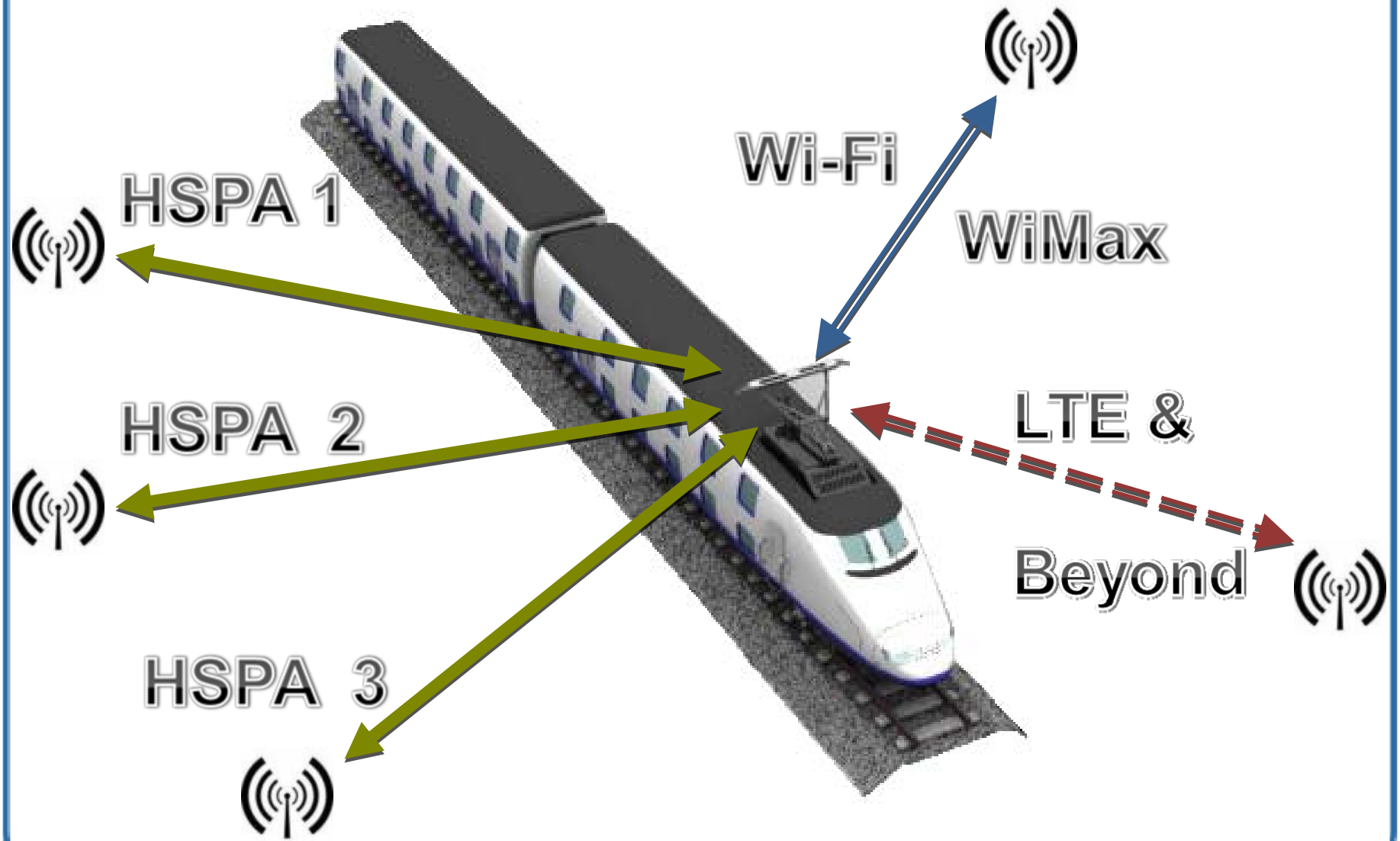
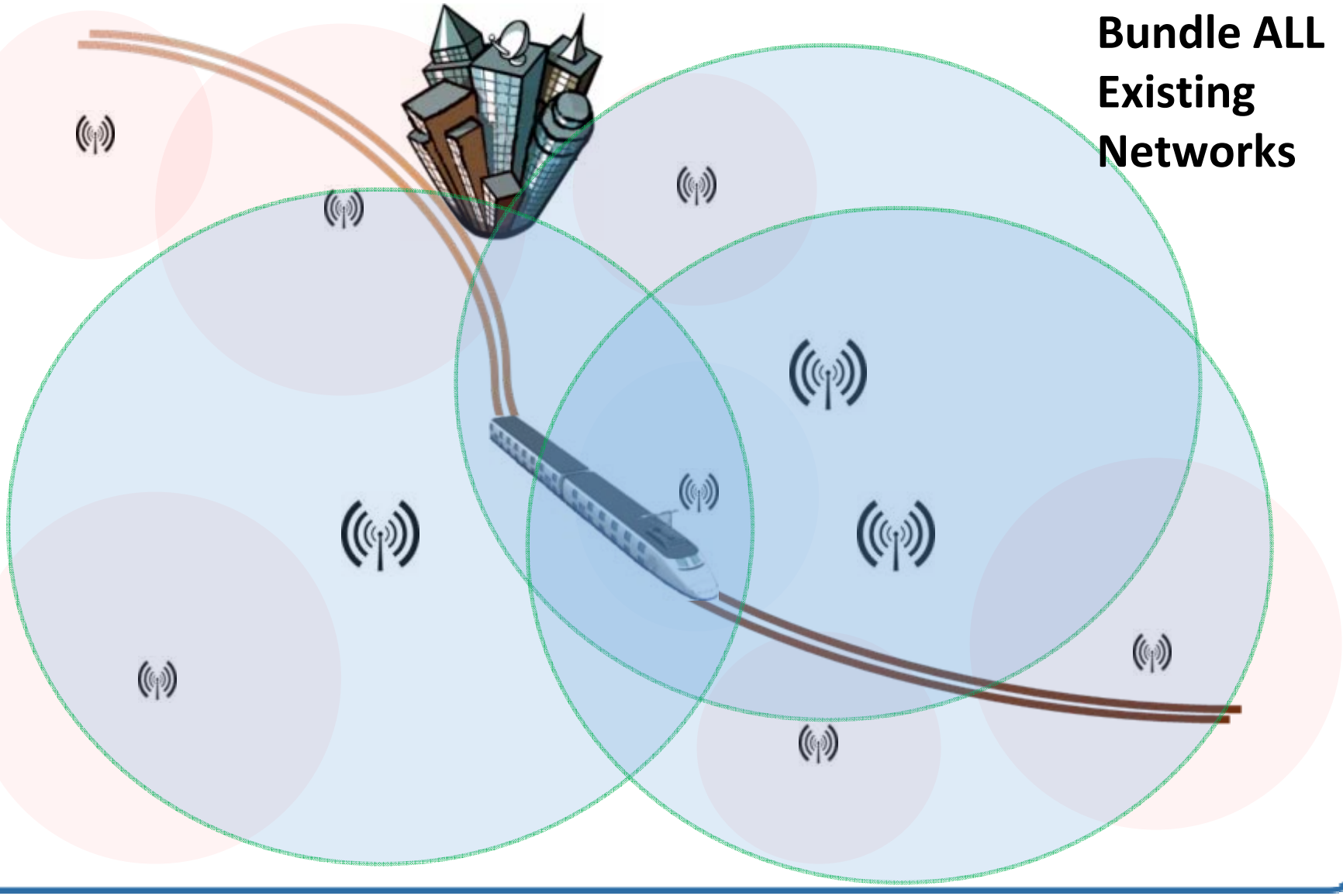
INTERNET ON TRAINS – HOW ?

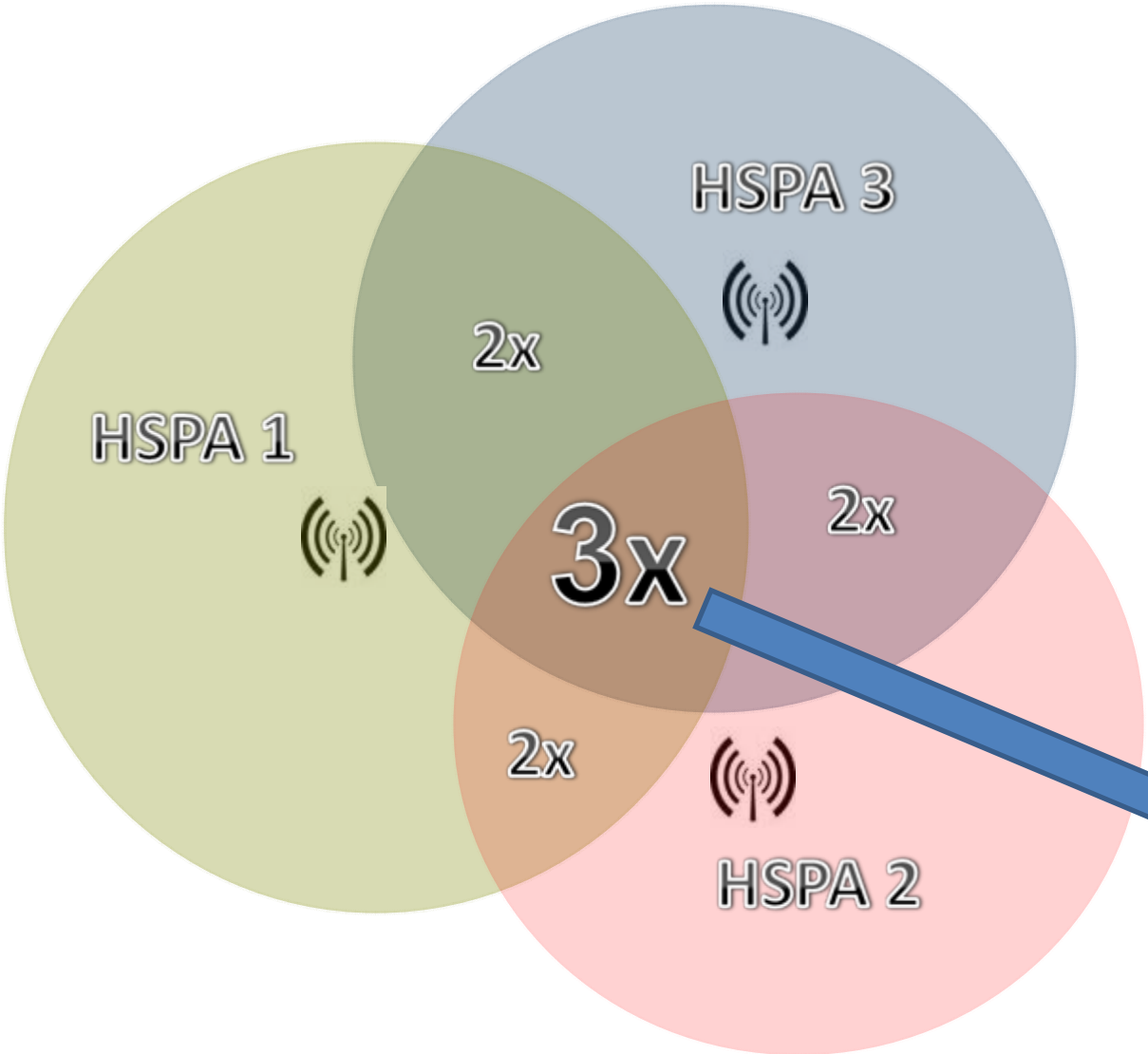
Technology – Combining Technologies



Technology – Combining Networks



Technology – Combining Operators



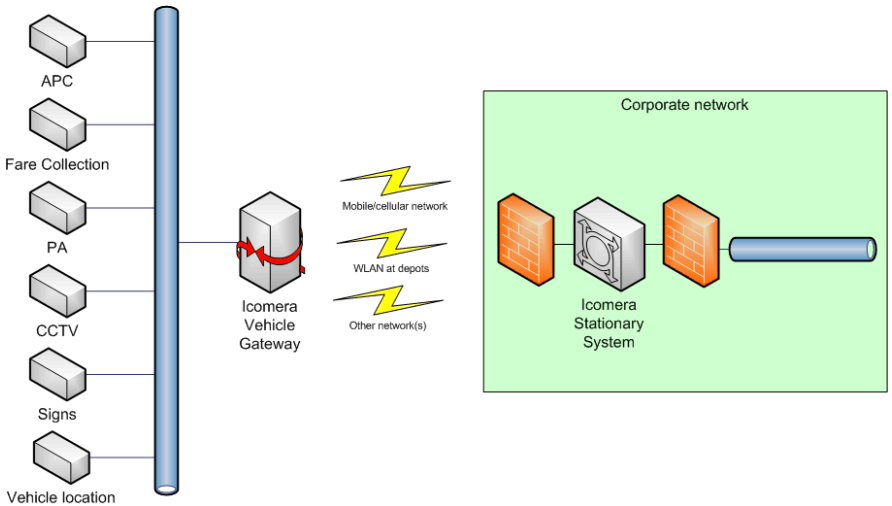
Bundle ALL Existing Networks

3 x HSPA+ Totals more Than 20 Mbit/s

Technology – System components

ON TRAIN

- One router per train is needed.
- Multiple antennas on the roof, depending on technology.
- Access point and switches.
- Communication between cars



OFF TRAIN

- Data subscriptions
- Private networks
- Central server
- Services

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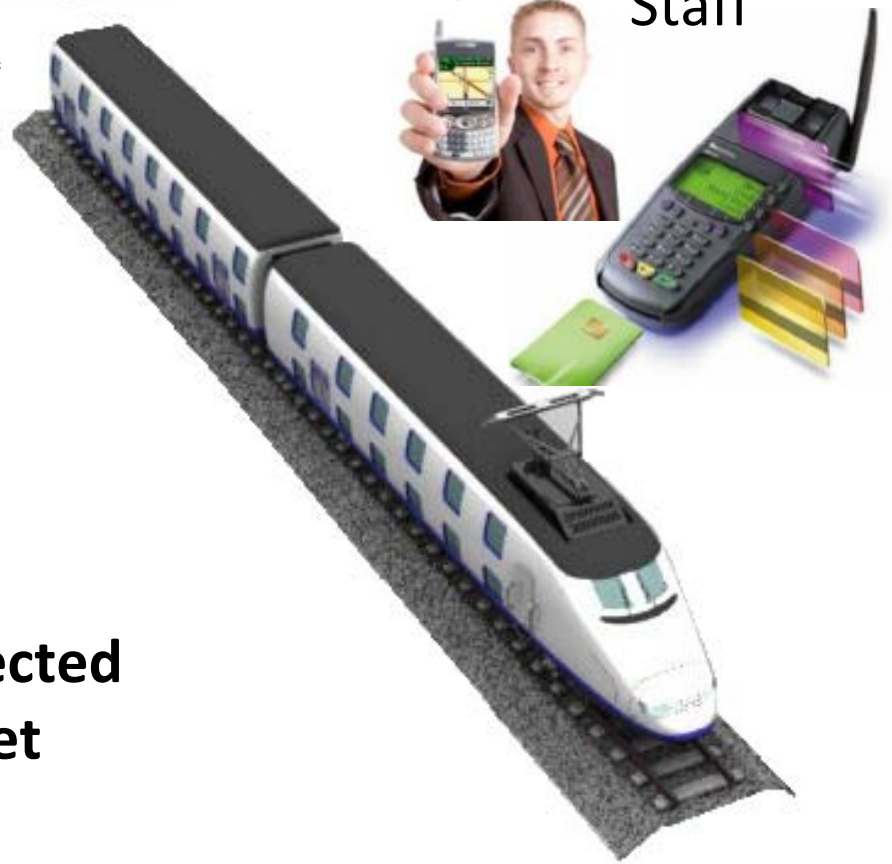
INTERNET ON TRAINS – WHAT ?

Applications

Onboard Coverage:
Connected
Passenger

Onboard Coverage:
Connected
Staff



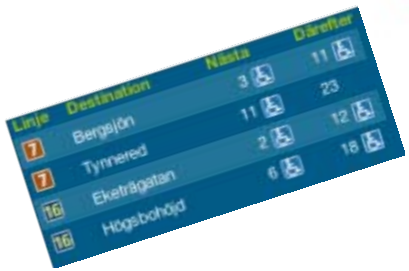
Connected
Fleet

Applications: Infotainment - PIS

Signs

GPS

Screens



Voice Over

Application: Connected Staff

19th Century Communication ≠ 21st Century Transportation

Get your staff connected - Now

Application: Connected Staff

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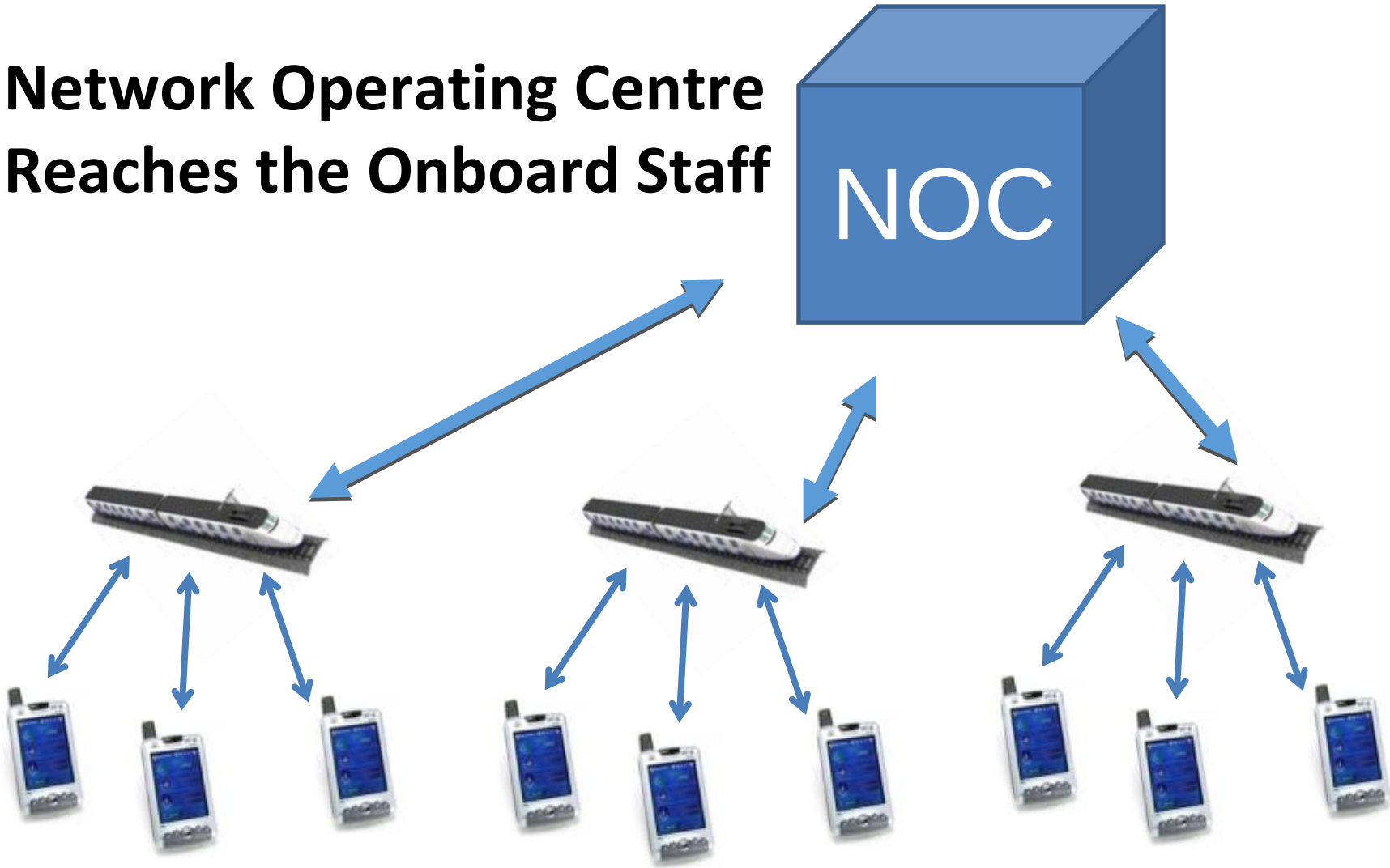
Network Operating Centre Reaches the Onboard Staff



Application: Connected Staff

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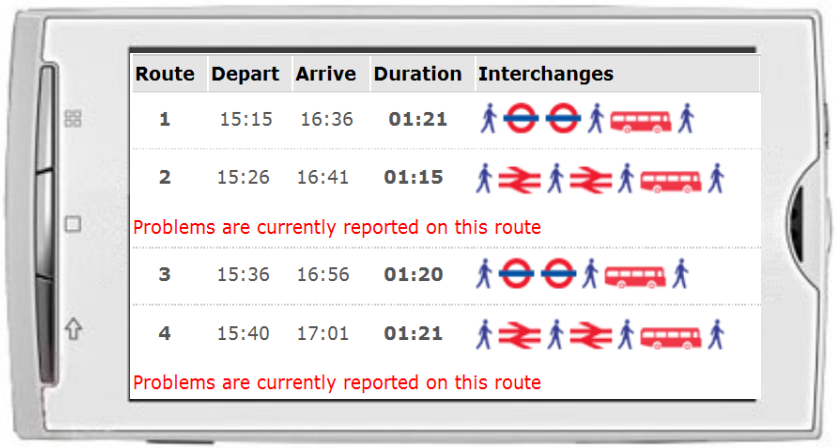
Relevant & Updated Information

Delays & Transfers



Route	Depart	Arrive	Duration	Interchanges
1	15:15	16:36	01:21	
2	15:26	16:41	01:15	
Problems are currently reported on this route				
3	15:36	16:56	01:20	
4	15:40	17:01	01:21	
Problems are currently reported on this route				

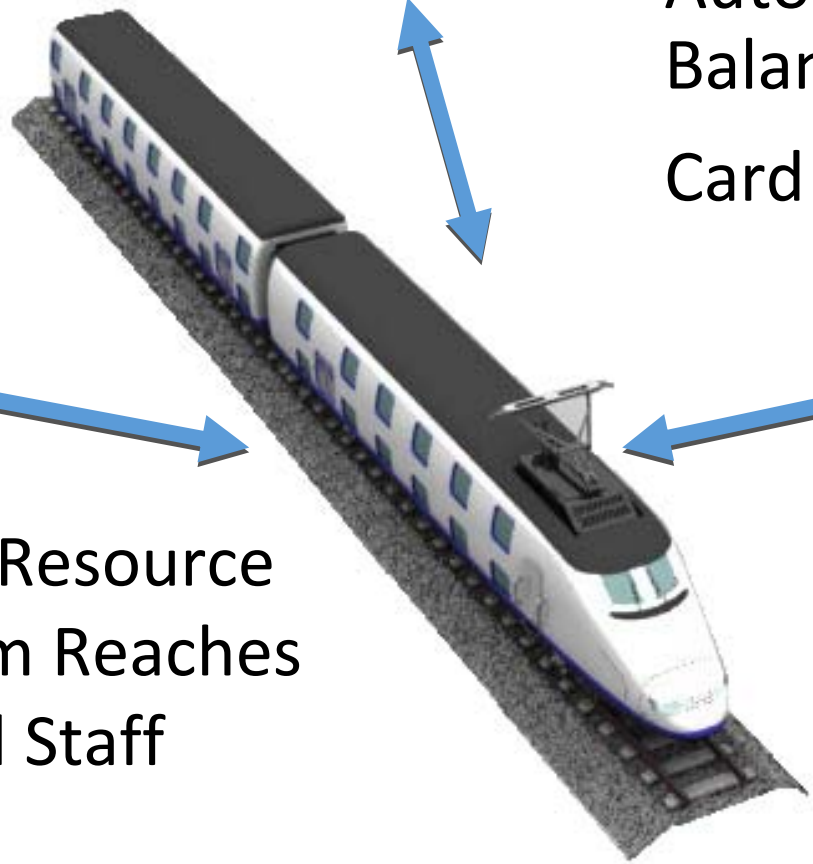
Passenger Lists

Application: Connected Staff

EPOS - Electronic Point of Sale

Automatic Stock Balance Update

Card Verification



ERP- Enterprise Resource Planning – System Reaches the Onboard Staff

Staff Information

Application: Credit card verification

Offline=
10 % Fee

Direct Payment Verification

Online ≡
2 %Fee

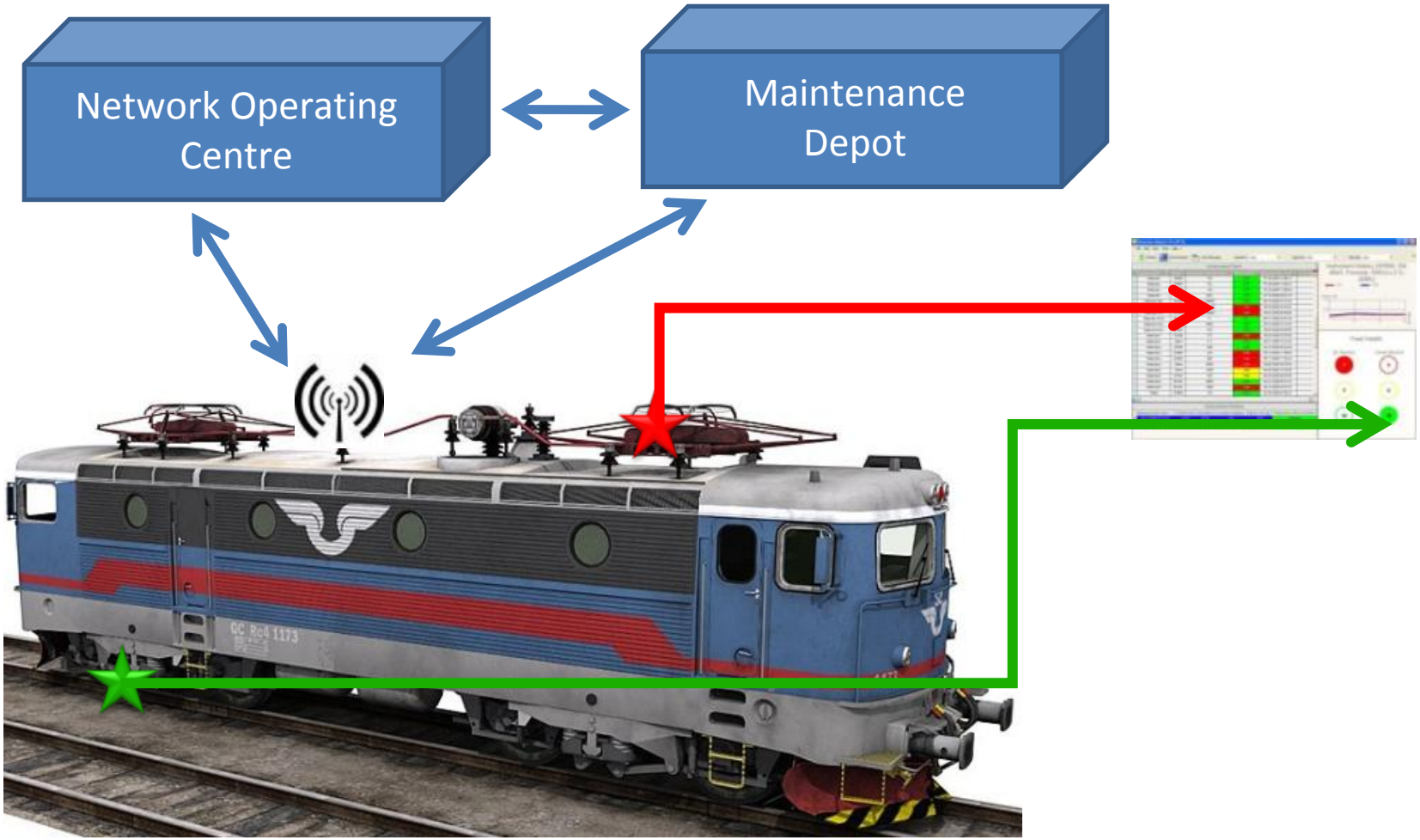
Application: Connected Fleet

Vehicle Health Monitoring

Preventive Maintenance

Application: Connected Fleet

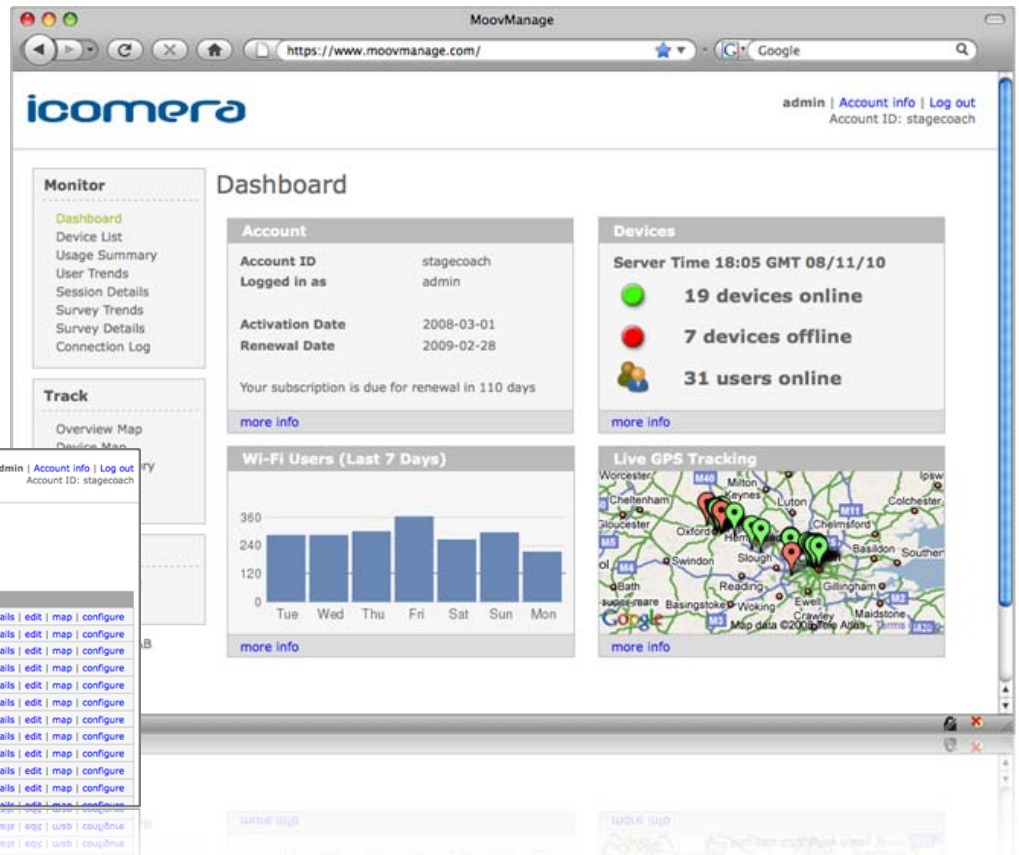
Live Diagnostics from onboard sensors

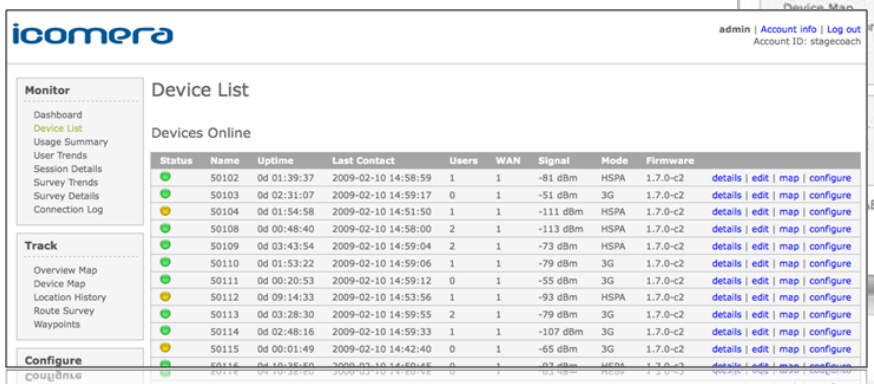


Application: Connected Fleet

Full Fleet – Real Time Monitoring and History Logs

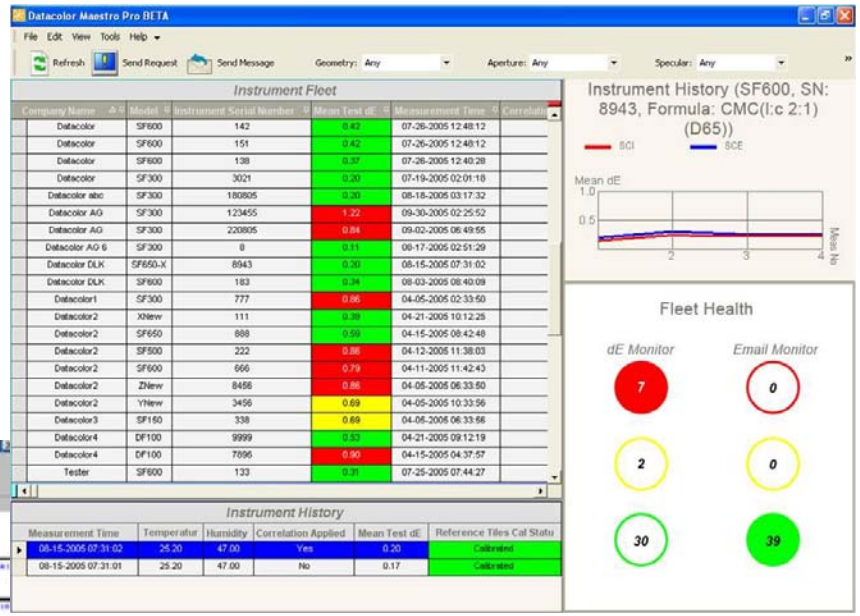
- Position Coordinates
- Maps
- Velocities
- Vehicle Condition
- Mission Data

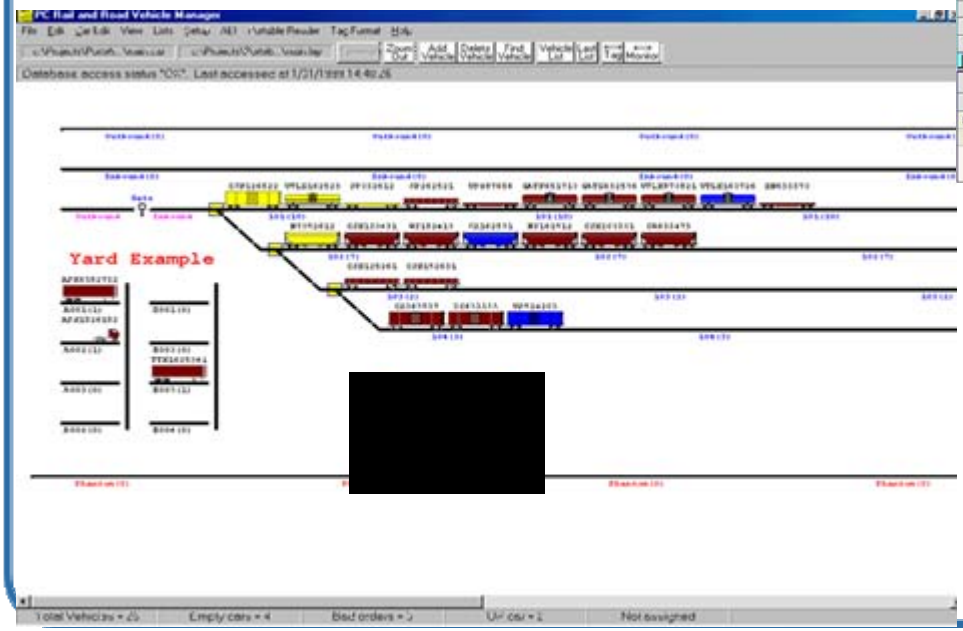




Application: Connected Fleet

- Position
- Condition
- Mission





Application: CCTV

CCTV – Real Time & Recording
Months of Searchable Video Logs

OFF board
Storage

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NEXT STEP – BUYING A SYSTEM

Key buying considerations

- Buy an **open platform** for future expansion.
- Buy a system which is **technology agnostic** and can handle any networks.
- Make sure that there is **seamless handover** between all networks.

Key buying considerations

- Buy a system which is specifically **built for the rail environment**.
- Buy a system which uses existing **hardware standards** as much as possible, which also gives a clear upgrade path.
- Buy a system which has been designed with **long life components**.

Key buying considerations

- Buy a system which offers a **range of applications** in other areas to get multiple benefits from the system.
- Buy a system where also different **service and support** levels are offered.
- Buy a system from a supplier with **superior knowledge in RF** and antennas since bad RF installation can dramatically reduce performance.

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