

# Wireless Networks in a Mobile World

Consumer vs. Industrial  
Wi-Fi: Why it Matters for  
Video Surveillance



**SEON**

# INTRODUCTION

## Finding the right Wi-Fi network



Are you spending too much time finding, retrieving and reviewing your surveillance video? You can realize some serious time and money savings by downloading video over a Wi-Fi network as your buses return to the yard. But not just any Wi-Fi network is suitable for video downloading.

This e-book will explore the two main types of wireless solutions (Consumer & Industrial) and what is required to deploy a Wi-Fi network that works for video surveillance.

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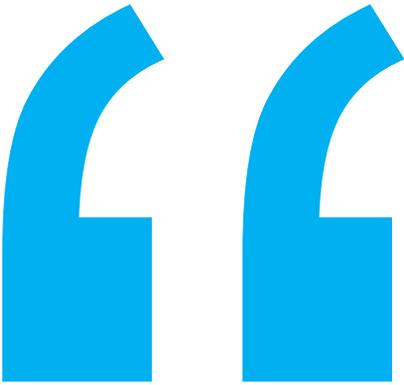
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# CHAPTER 1:

## What is Wi-Fi?



Wi-Fi refers to a system that uses radio frequencies to connect computers, phones and other enabled devices (such as mobile DVRs) wirelessly.



Digital technology is used to convert data such as short messages, e-mail or video into small packets of 0's and 1's."

*CTIA – The Wireless Association*



Most computer operating systems support wireless technology, and Wi-Fi enabled devices including laptops, mobile phones, MP3 players, video games and other portable devices. With Wi-Fi, consumers can e-mail, surf the web, download MP3s, or connect to a printer from anywhere in their home or office.

Wireless technology gives people additional mobility while facilitating access to information and homes and businesses are increasingly embracing Wi-Fi for all the advantages it offers.

# CHAPTER 2:

## History of Wi-Fi



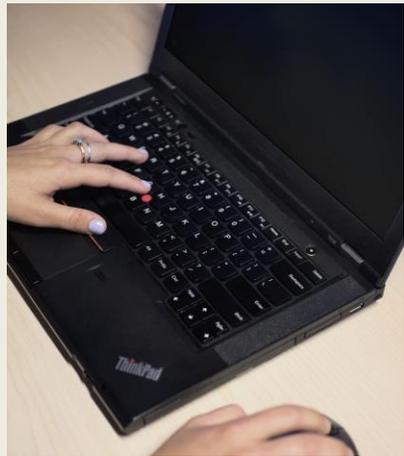
Guglielmo Marconi – First Radio Telegraph Transmission 1901.

The history of wireless communication goes back almost 200 years. A succession of discoveries and inventors paved the way, including Guglielmo Marconi, who sent the first radio telegraph transmission across the English Channel in 1901.

## WIRELESS NETWORKS IN A MOBILE WORLD

Wi-Fi as we know it today would not exist without a decision by the Federal Communications Commission (FCC) in 1985 to open several bands of wireless spectrum for civil use, clearing the way for communications entrepreneurs.

Once wireless equipment vendors established an industry-wide standard in 1997 (802.11a and 802.11b), wider applications were possible and companies began building compatible devices. Computer makers, beginning with Apple, incorporated the technology into its laptops in 1999. Other computer makers quickly followed and Wi-Fi Enabled products have flooded the market.



Wi-Fi Enabled Devices

# CHAPTER 3:

## What is Consumer Wi-Fi?

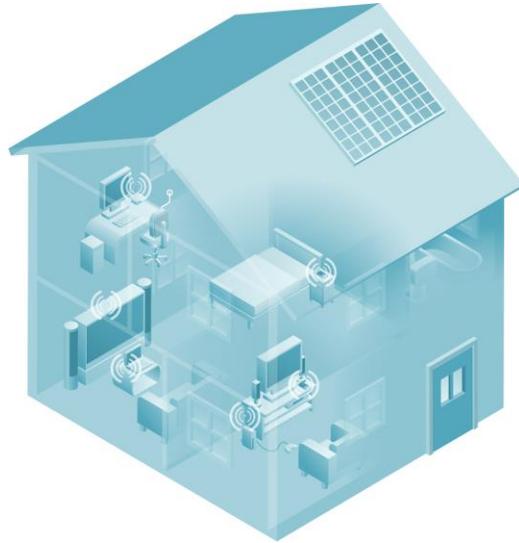


*Consumer* Wi-Fi is the wireless system typically used in homes and bought in retail stores. It requires a personal computer, modem, a wireless router, a cable, and access to an internet provider. It typically has a range of up to 200 feet.

## WIRELESS NETWORKS IN A MOBILE WORLD

*Consumer* Wi-Fi works well where computers, printers and other Wi-Fi enabled devices are:

- ✓ Indoors
- ✓ Static
- ✓ Close together

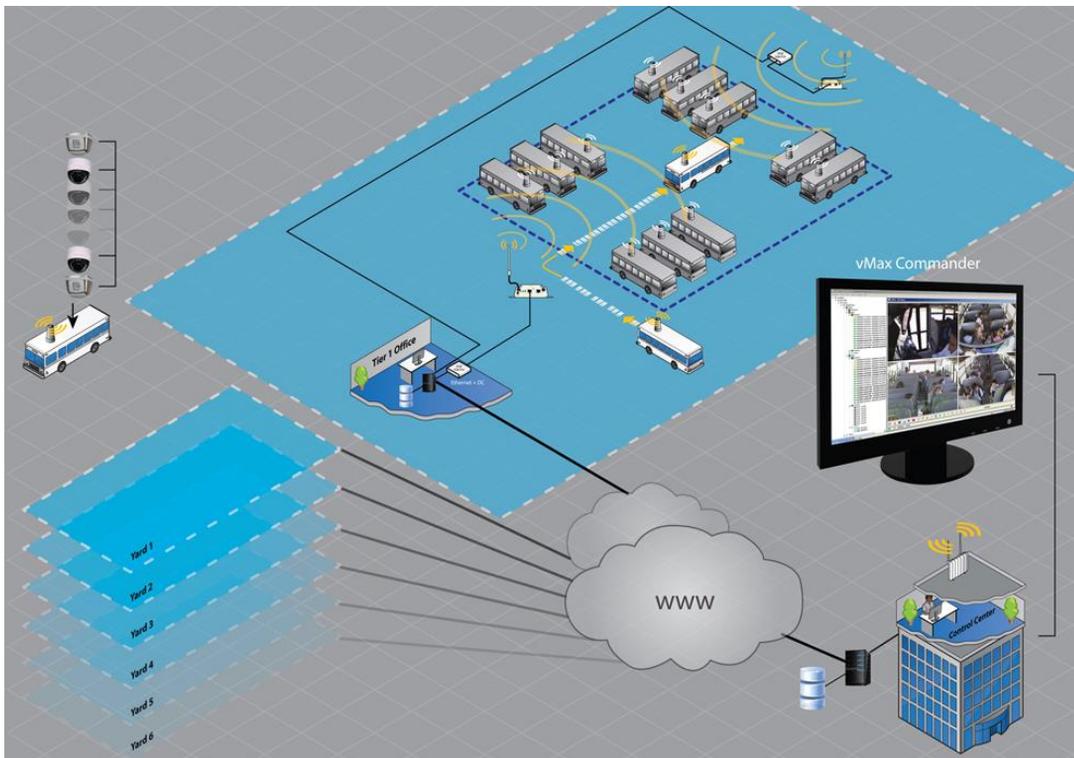


*Consumer* Wi-Fi **DOES NOT WORK WELL** when it attempts to network with moving vehicles over a large area because:

- ✓ Of potential **OBSTACLES** such as buildings & trees
- ✓ Its **LIMITED** range and scalability
- ✓ It is **NOT WEATHER-PROOF**
- ✓ It **CAN'T AUTOMATICALLY SWITCH** to stronger signal access points
- ✓ Inadequate and vulnerable **SECURITY**

# CHAPTER 4:

## What is Industrial Wi-Fi?



*Industrial* Wi-Fi is specifically designed to address the needs and challenges of the transportation industry. It is built to withstand the rigors of bus transportation and outdoor use, and its range and scalability is limitless.

## WIRELESS NETWORKS IN A MOBILE WORLD

The basics of an Industrial Wi-Fi network are:

✓The **access point** – which can be located on any existing infrastructure (telephone pole, building, street light) and can communicate over great distances. The access point communicates with a PC or another access point depending on the size of the network.



✓An **antenna and a wireless bridge** – which are installed on each bus. The wireless bridge communicates with the digital video recorder (DVR) and the system's nearest access point.



## WIRELESS NETWORKS IN A MOBILE WORLD

Unlike *consumer* Wi-Fi, *industrial* Wi-Fi allows multiple buses moving within a large depot to connect to the strongest system available. If a stronger signal becomes available, the system will automatically switch. This **ROAMING CAPABILITY** is essential in large transportation properties, or in cases where there are multiple bus yards.



*Industrial* Wi-Fi can also **COPE WITH OBSTACLES** such as buildings or trees, which cause interference and weak signal strength. Signal strength, stability & efficiency is essential for video downloading. Industrial Wi-Fi is designed to handle the downloading requirements of any fleet, regardless of the size of the video files, or the number of buses involved.

*Industrial* Wi-Fi also works with a transportation property's existing IT architecture and provides a **SECURE NETWORK**.

# CHAPTER 5:

## Consumer vs. Industrial Wi-Fi



Effective wireless solutions for mobile environments face many unique challenges that are not encountered in our homes. Consumer systems have proven inadequate for the transportation industry because they fail to address the unique situations involved.

## WIRELESS NETWORKS IN A MOBILE WORLD

Consumer Wi-Fi networks aren't strong enough to withstand the rigors of mobile environments, they aren't smart enough to handle roaming, and they aren't secure, stable or efficient enough for industrial purposes.

*Consumer* Wi-Fi is weak. Connections are easily lost, and its scalability is very limited.

Consumer Wi-Fi	VS	Industrial Wi-Fi
Limited Range		Large Coverage Area
Single Access Point		Multiple Access Points
Hard to Scale		Easily Scalable
Weak Signal Strength		Strong Signal
Inadequate Security		Highly Secure
Static Environment		Designed for Roaming
Often Unstable		Copes with obstacles

Consumer vs. Industrial Wi-Fi: Key Differences

# CHAPTER 6:

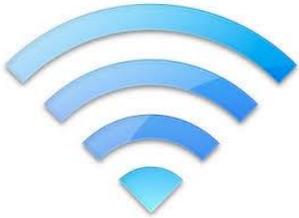
## Challenges of Wi-Fi in a Mobile World



Wireless technology has many benefits for transportation managers that can save significant time & money. But, implementing wireless technology that works well in a mobile environment is not without its challenges.

## WIRELESS NETWORKS IN A MOBILE WORLD

In any given transportation property, there are often multiple vehicles moving through one or more entry or exit points. As vehicles enter the yard, each one tries to find the strongest signal to connect to the office.



*The strength of the signal and the bandwidth available greatly affect the speed with which video can download.*

Video download requires large amounts of bandwidth, and the number of vehicles trying to download can greatly affect this process (imagine fleets of 10, 20 or 100+).

*Failure to account for these factors can result in system inefficiency, dropped signals, lost information, staff overtime and headaches.*



Distance from a yard's wireless access point(s) and signal interference can also degrade a bus's ability to download information quickly. Walls, trees, and other radio devices also interfere with the transmission of radio waves.

# CHAPTER 7:

## Choosing the Right Solution



There is no one-size-fits-all when it comes to choosing the right wireless solution. What works in one yard or depot may not work in another. That's why it's important to consult an [expert in the field](#) and who understands the challenges of a mobile environment.

## WIRELESS NETWORKS IN A MOBILE WORLD

Failure to address any one of these factors could result in wireless implementation that just won't work:

### TECHNOLOGY:

Digital video recorders (DVRs) must integrate wireless technology, and they must be robust enough to withstand the rigors of the road.

### AUTOMATIC ROAMING:

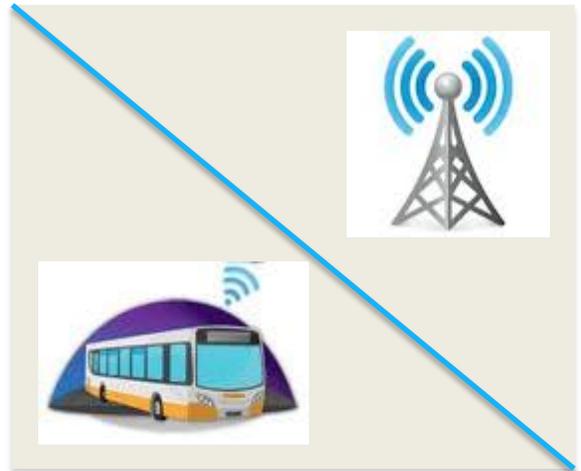
Vehicles must be capable of finding the strongest signal among multiple access points, and switch signals automatically if necessary.

### INTEGRATION:

The system must not conflict with existing networks and IT infrastructure and work seamlessly with other onboard technologies.

### EFFICIENCY:

The system must have sufficient power and bandwidth to download video reliably and efficiently, regardless of the number of buses.



### LOCATION:

The network must be able to accommodate the size and geography of the property. (One vs. multiple yards; office location different than depot)

### OBSTRUCTIONS:

The network must be able to function regardless of any obstacles or interference, such as buildings, trees or other wireless signals.

### SECURITY:

The wireless technology must offer the latest security protection.

# Want a Wi-Fi network that works for video?

Get a quote: [info.seon.com/wifi-that-works](http://info.seon.com/wifi-that-works)

Let Seon's qualified wireless professionals design and install an industrial grade Wi-Fi network guaranteed to work for your video and audio downloading needs.

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