FROM DROP-OFF TO TAKE-OFF

INCREASE AIRPORT EFFICIENCY AND SAFETY WITH CRITICAL COMMUNICATIONS SOLUTIONS

MOTOROLA SOLUTIONS

"The overall quality of ground-handling services has also not kept with evolving needs especially in terms of reliability and resilience, safety and security. Disruptions experienced have shown the need for increased coordination of ground operations for European airports and the network as a whole (knock-on effects) so as to ensure continuity of airport operations."

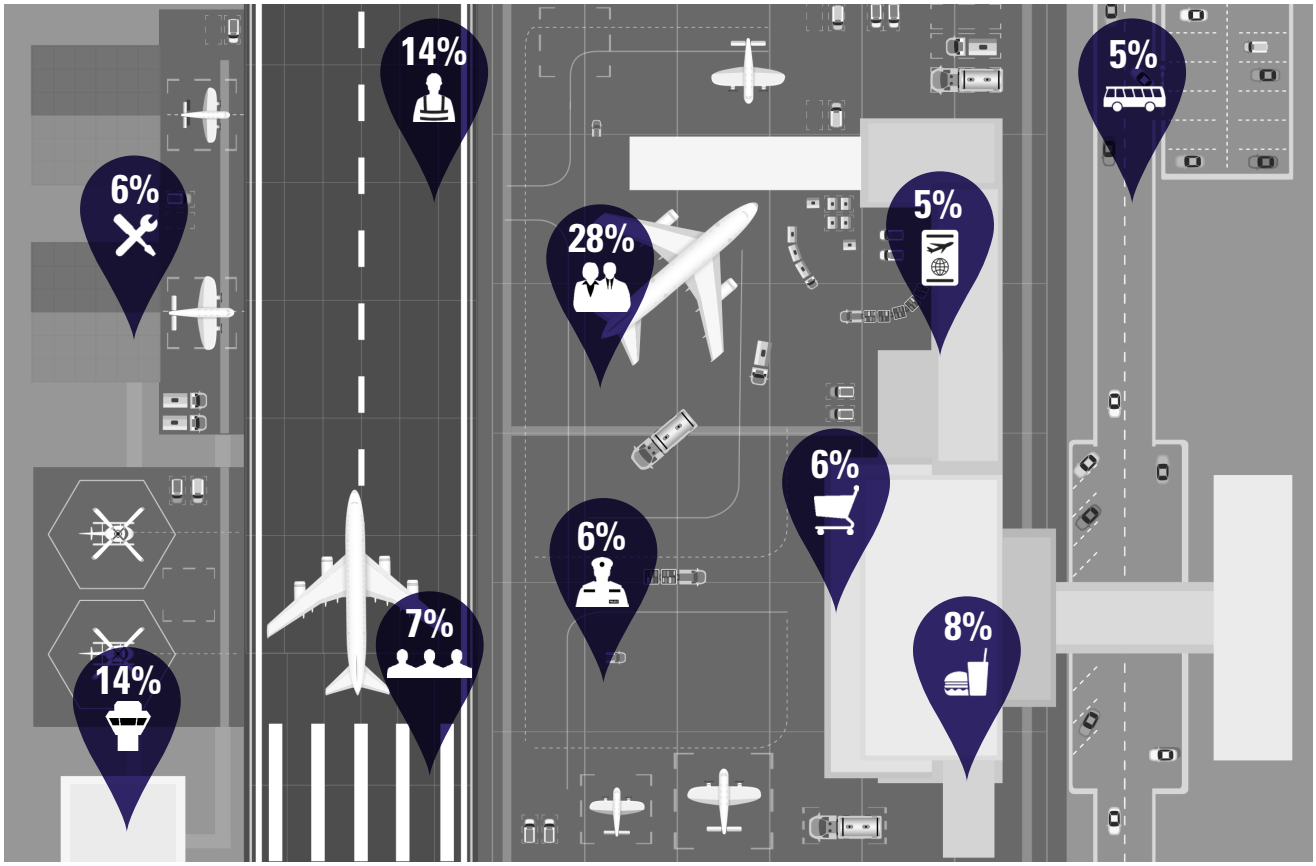
- **EUROPE'S AIRPORT 2030: CHALLENGES AHEAD**
  European Commission 2011

COLLABORATE AND SOAR TO GREATER EFFICIENCY AND SAFETY

The increase in air traffic and travel demands has spurred the need for air transportation enterprises to expand and modernise to ensure safe and efficient experiences for all.

Getting passengers from drop-off to take-off is an intricate process made even more complex when you consider the number of teams and functions it takes to ensure smooth operations. From airport, to airline and cargo operations, the need for succinct collaboration between all three is paramount to passenger experience, therefore airport success.

EUROPEAN AIRPORTS: DIRECT EMPLOYMENT BY ROLE



Airline Services	472,000 at European Airports in 2013 (28% of total direct jobs)		**Maintenance, Repair and Operations (MRO)**	102,400 (6%)
Ground Handling	241,800 in 2013 (14%)		**Retail and In-Terminal Services**	107,200 (6%)
Airport / ATC Support	238,500 (14%)		**Customs, Immigration and Other Governments**	90,900 (5%)
Food and Beverage	130,300 (8%)		**Ground Transportation**	79,100 (5%)
Airport Security	106,700 (6%)		**Other**	127,200 (7%)

Source Economic Impact of European Airports, InterVISTAS, 2015

FOUR CRITICAL AIR TRANSPORT CHALLENGES

All commercial businesses face the challenge of facilitating growth to maintain competitive advantage and customer loyalty. However, airports must do so against the backdrop of fundamental challenges; not least the fact that 44% of European airports are loss-making[1] so any investments made need to deliver.

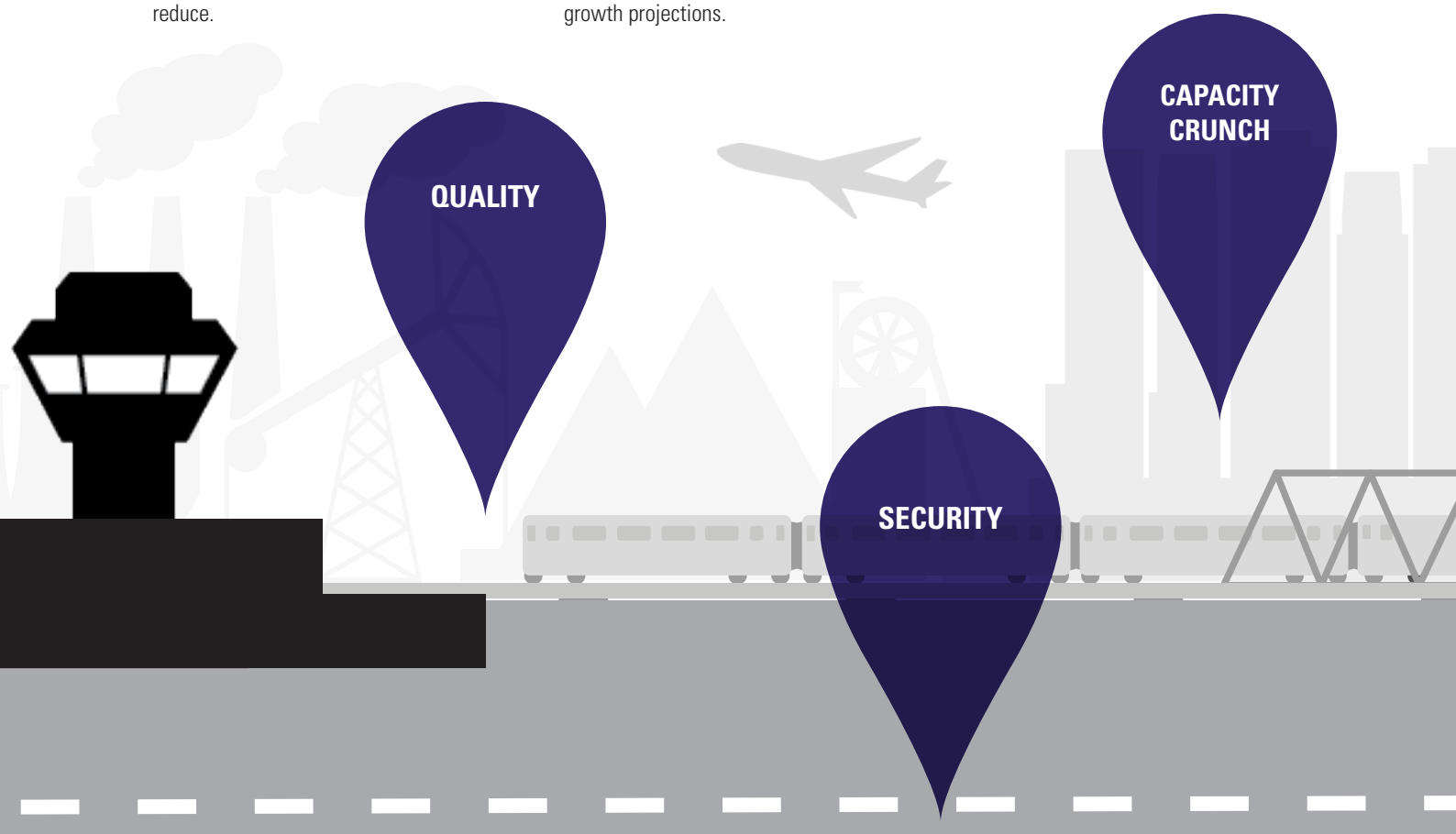
CAPACITY CRUNCH
With air traffic predicted to double by 2030, we are undoubtedly heading for a capacity crunch. In fact, five major European airports have already met that milestone and by 2030 that number will be at 19. The impact of such saturation if it is not addressed successfully is extreme in that 50% of all flights will be delayed[2].

QUALITY
European airports employ 12.3 million people from check-in, to security, baggage-handling, maintenance, refuelling and cleaners. The expectation on each worker is that they all play a part in getting passengers from drop-off to take-off smoothly and on time. However, the reality is that 70% of all delays are caused by problems due to the turnaround of aircrafts[2] – delays that a connected workforce can reduce.

SECURITY
1.8 billion passengers travel through European airports each year[1] and it's unfortunately become a necessity to improve and tighten security measures throughout terminals in light of increasing threats of terrorism. And whilst it's the norm to immediately think of the physical presence of threats, in today's digital age, where many airport functions are fulfilled via computerised networks, there is also a risk from cyber attacks.

ENVIRONMENT
Never more so have airports had to address the issue of the environmental footprint they impose; from both noise and pollution. At a time when increasing passenger numbers seemingly dictate a need for more flights, it's not easy to see a solution that balances environmental responsibility with meeting growth projections.

"**20%**
OF OPERATING COSTS ARE SECURITY RELATED.[1]"



MEETING THE CHALLENGES HEAD-ON

Tackling each and every one of these challenges isn't easy; on the surface they are all unique and demand different focuses of concentration. However, there is one common thread running through these forces for change: the importance of a reliable, secure and widely-accessible communications infrastructure. Day-to-day the voice and data communication with front-line staff is where the quality of operations and service for passengers can have the most immediate impact.

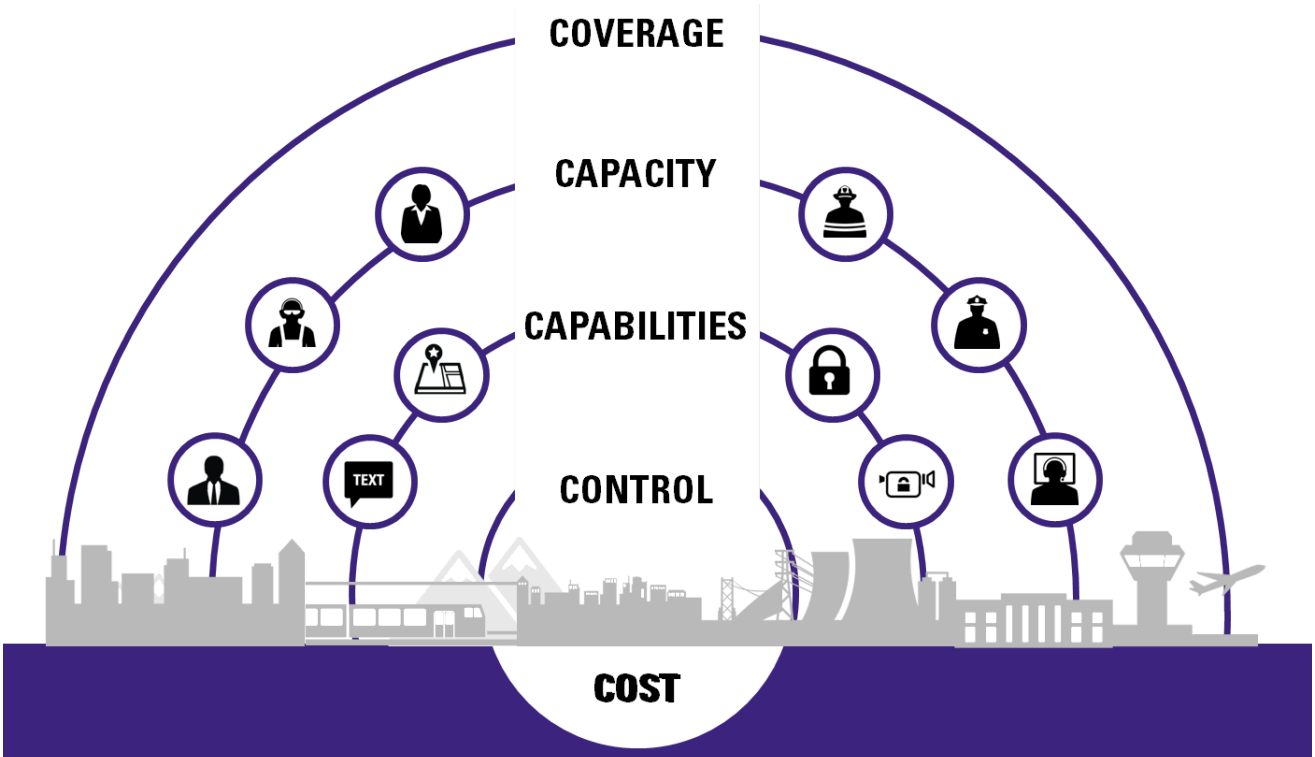
Facilitating real-time flow of information from individual-to-individual or team-to-team ensures that those that need to know, know and can act in a way that minimises disruption and keeps flights assigned to their original departure slots.

> **"€55.3 BILLION INVESTMENT IN FACILITIES ACROSS EUROPEAN AIRPORTS BETWEEN 2015 - 2018.[1]"**

EVALUATING THE 5 C'S OF CRITICAL COMMUNICATIONS

Suggesting a communications network is key to driving operational success is an over-simplification of both the problem and solution. When it comes to implementing an effective network there are many considerations to be made in order to determine which one is right for you. You need to consider the services you will need, budget and what constitutes sufficient network performance, to name a few.

As you evaluate what communications technology is right for you, consider the following categories: coverage, capacity, capabilities, control and cost. By understanding these categories, you can start to evaluate what your top communication priorities are:



Cost

What is the budget for your system?

What type of system is it?

Are you using multiple devices for voice and data?

Control

How effective is your ability to control your network and devices?

Do you need both software and system administration?

How do you want to control your system?

Capabilities

What are the features of your current network and radios?

What data applications would you like to use?

What are you trying to accomplish with data?

How secure is your data?

Capacity

Who talks or uses data on your system?

How many organisations or users are there on the network?

If there was an emergency, would your system be able to handle it?

Coverage

Do you need coverage inside buildings and/or over long distances?

Do you need voice-roaming capability?

Do you need data-roaming capability?

THE CONNECTED TRANSPORT WORKER

The subsequent success of any communications rollout is determined by whether you have created the Connected Transport Worker. Whether they are driving a bus between terminals, helping a passenger or cleaning aircrafts, it is imperative that your users stay connected. The right devices for the right users will help ensure they stay ahead of any issues before they result in flight delays or emergencies.

ACCESSS VOICE AND DATA

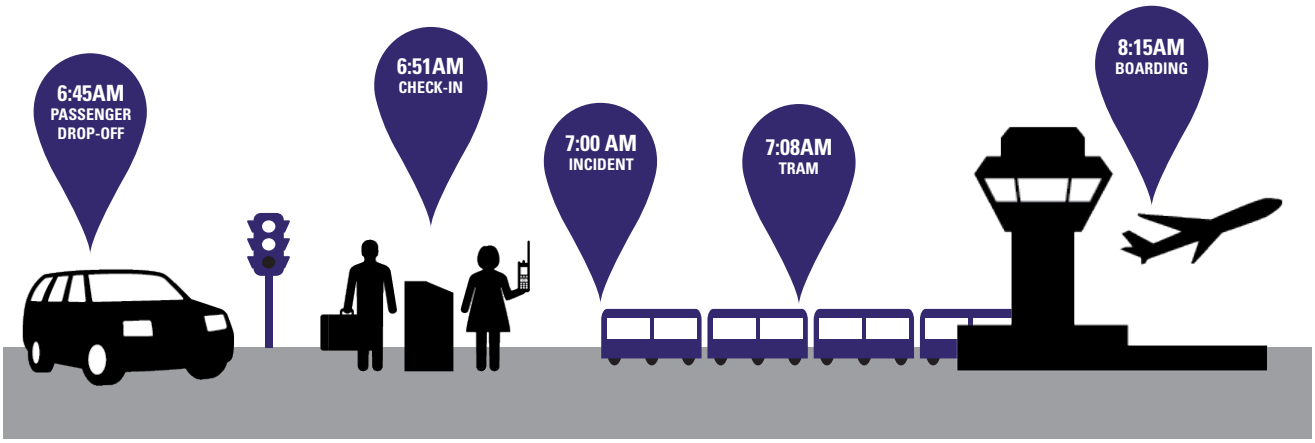
Motorola Solutions has an extensive portfolio of devices in recognition that individuals and teams need and operate in different circumstances. You will be able to find one that suits each user, from those on check-in that need to send a simple text, to security officers needing to send instant warnings and supervisors needing to fill out work reports at the end of shifts. Whether they need a full screen for mapping or a simple keyboard, there is a device for everyone.

EVERY DEVICE. EVERY NETWORK. EVERY TEAM. CONNECTED LIKE NEVER BEFORE.

WAVE Interoperable Push-to-Talk provides secure, real-time communications from any IP-enabled position on the network, on any device - such as smartphones, laptops, PCs or tablets. This means that whether your workers are mobile or in the office, on the ground or in the air, they can effectively communicate and collaborate through voice, text and data.

PROVIDING THE BEST SERVICE FROM DROP-OFF TO TAKE-OFF

Building a reliable network provides your workforce with the tools and connectivity to be productive and ensure their passenger's safety. From check-in to maintenance engineers, they will need instant access to detailed information and communications via a device that is appropriate for their role. Intelligent network triggers and applications will help ensure that the right worker receives the right information in real time to successfully complete the right task.



6:45AM - PASSENGER DROP-OFF

As the passenger is dropped off, under-cover security officers monitor the area. They are using the **LEX L10 RUGGED LTE HANDHELD** to get access to real-time information such as photos and videos as well as location of other officers and incidents.The **WAVE** app allows them to communicate with radio users at airport security, control room operators and customer service attendants.

6:51AM - CHECK-IN

The passenger has a dietary restriction he wants to make the flight crew aware of as soon as possible. The customer service attendant calls their colleague at the gate using their **ST7000 SMALL TETRA RADIO,** which fits nicely into their pocket**.** The attendent uses an earpiece that plugs into their radio so they can keep their focus on the task and customer they are interacting with. They receive confirmation that the flight crew will happily accomodate the dietary restriction.

6:55AM - CONTROL ROOM

An unauthorised person enters a restricted area in the airport. The sensor connected to an **ACE1000 REMOTE TERMINAL UNIT** detects the intruder and the surveillance camera takes a photo of the area and sends it to Command. The control room operator views the image of the intruder on **COMMANDCENTRAL** and shares it with a security guard who views it on his TETRA radio.

7:00AM - SECURITY

After the security guard receives the call and views the image on his **MTP6650 PORTABLE RADIO**, he makes his way to the restricted area. His **Si500 VIDEO SPEAKER MICROPHONE** records the interaction in case the intruder caused a threat. The video would be uploaded to a secure cloud and categorised automatically in case it was needed for evidence later.

7:08AM - TRAM TO THE GATE

The passenger takes a tram to get to their gate. The tram driver and guard are both able to use the **MTM5500 MOBILE RADIO** with **DUAL CONTROL HEADS** so they can communicate with each other and with passengers using a loud speaker. The guard can keep the driver informed of any incident that occurs on the tram and they are both able to receive updates from other workers in different areas of the airport.

8:15AM - BOARDING

Before the passenger boards, the engineers and refueling team perform standard tests and maintence on the aircraft. They are all using the ATEX-Certified **MTP8550Ex PORTABLE RADIO** and **ACTIVE-NOISE-CANCELLING REMOTE SPEAKER MICROPHONE** which help to ensure they will hear and be heard over loud machinery and to ensure they will stay safe while using their radios in a hazardous environment.

CONTROL AND PROTECT CRITICAL TRANSPORT INFRASTRUCTURE

Processes carried out in the background are vital to the day-to-day running of any smart airport. They can automatically detect what is happening around them, consider and process all available information, and act and react to maximise performance. Anything less than real-time response offers vast ground for malicious activity, human errors and operational deficiencies.

As a strategic asset, your airport is not just a vital symbol of an open and dynamic society, it is a crowded and dense hub vulnerable to any number of potential threats.

Considering the severity of threats and how quickly they can develop, your best option is to fend them off before they start. Take control before they take over and control you.

SMART SAFETY AND SECURITY

Perimeter monitor and control
Gate control (Internal / External)
Entrance Control
Emergency buttons
Noise control

CRITICAL INFRASTRUCTURE

Runway digital signs
Runway intrusion Sensors
Runway light control
LMR RF Coverage Probe

ASSET TRACKING

Fuel tankers
Corridors
Landside semi / Portable assets

Motorola Solutions provides a multi-layer security suite that allows detection, management and distribution of security-related incidents within the airport and on its perimeter, thus providing a safe enviroment for a passengers and airport staff.

CASE STUDIES

BRITISH AIRWAYS AT HEATHROW REQUIREMENT: An easy-to-use, cost-effective communication solution that is flexible and can accomodate changes. The airline needed to reduce the total cost of ownership of voice, video and data services in use. Finally, British Airways wanted a way to manage communication services with ease. British Airways was in a position to also transfer its ground-to-air communications onto its IP network

WAVE was recommended for and deployed to British Airways because it provides secure, real-time communications from any IP-enabled position on the network and from a number of industry standard smartphone devices. This capability means that all British Airways end users, whether mobile or in the office, can effectively communicate and collaborate through voice, text and data. Using WAVE, British Airways now has the opportunity to operate a mixed estate of devices without impairing functionality.

THE SOLUTION

- Secure, real-time communications from any IP-enabled position on the network and from a number of industry standard smartphone devices.
- WAVE Desktop Communicator was deployed to more than 75 operational positions serving in excess of 1,000 users

STUTTGART AIRPORT AND BADEN-AIRPARK REQUIREMENT: Stuttgart Airport wanted to update and extend its Motorola Solutions TETRA digital radio system and install a new system at Baden-Airpark.

Baden-Airpark wanted a radio system that was highly reliable and secure, quick to install and which could support a wide variety of future-proof communication functionality. Stuttgart Airport decided to deploy two further MTS2 TETRA base stations to allow this digital infrastructure to connect via a fast-fibre interface with the newly implemented Dimetra IP Compact solution at Baden-Airpark,about 80 km away. This enables Stuttgart Airport to provide services and support to Baden-Airpark. Stuttgart Airport's radio system is also being updated to the latest software platform available for its hardware, Dimetra Release 7.2

Now both airports have interference-free, clear voice calls in a high background noise environment and a model for the future that they can roll out to others.

THE SOLUTION

- Dimetra IP Compact
- (2) MTS2 TETRA Base stations
- (4) MTS2 TETRA base stations
- (90) MTP850 TETRA portables
- (46) MTM5400 TETRA mobiles
- MCC7550 IP Dispatch consoles
- MSI Planned Maintenance Contract - yearly service agreement

MILAN AIRPORTS REQUIREMENT: With 1,200 operating radios and an increase in operations, SEA needed a more dynamic solution for communications. Faced with the need to replace an outdated system and the need to cope with an increasing demand of services, SEA chose to switch to Motorola Solutions Dimetra TETRA.

In Malpensa - where the old and the new systems had to coexist in the migration phase - everything was fully operational within just two weeks, including the configuration of 1,000 new radios. At Linate airport, the system, supporting 400 new radios, was set up in just a week.

Motorola Solutions' high-performance TETRA base stations now deliver TETRA network coverage in both airports.

THE SOLUTION

- The Dimetra IP Compact system and supporting 400 radios were set up in just a week
- 1000 new radios configured in just two weeks
- A four-year managed services agreement with SEA, guarantees technology evolution including the replacement of its complete telecommunication system

NIKOLA TESLA AIRPORT, BELGRADE REQUIREMENT: The airport wanted to migrate from conventional analogue radio to a new digital system and also to improve the coordination of firefighters in critical situations.

Nikola Tesla identified increasing requirements within the airport, where poor spectral efficiency and future expansion plans were beginning to overstretch the capabilities of their conventional analogue radio systems. It was clear the system needed to be upgraded but due to lack of budget, it was impossible to change the entire system at once – a step-by-step migration was necessary. The equipment supplied included 350 MOTOTRBO™ radios providing the ideal solution. Old analogue radios now work alongside new digital ones, the network is resistant to interference, the audio capabilities in high-noise environments means coverage has been extended and firefighters can be accurately located in critical situations.

THE SOLUTION

- 350 MOTOTRBO radios: DP/DM 3000 Series, DP/DM 4000 Series
- 3 MOTOTRBO VHF DR 3000 repeaters
- 5 MOTOTRBO UHF DR 3000 repeaters
- MOTOTRBO Capacity Plus
- MOTOTRBO IP Site Connect
- SmartPTT Enterprise

MOTOROLA SOLUTIONS

Motorola Solutions is the leader in mission-critical digital voice and data communications. Solutions include dedicated and customised communications infrastructures for airports. Motorola Solutions works with airport operators around the world in the development and provision of advance networks designs to support the industry priorities of safety, efficiency, improving the passenger experience and reliable, effective communication.

For more information on our communication solutions for rail operators you can:
Visit **motorolasolutions.com/transportation**

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1. http://www.aci-europe.org/policy/fast-facts
2. Europe's Airports 2030: Challenges Ahead, European Commission, 2011
3. Economic Impact of European Airports, InterVISTAS, 2015

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