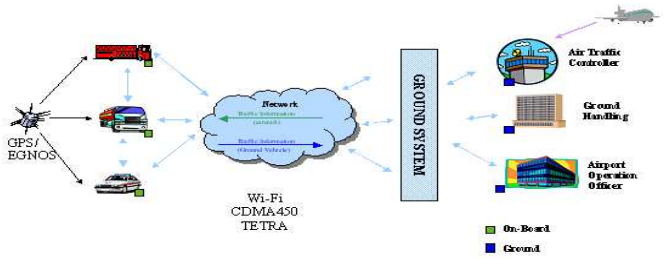
OBJECTIVE

The escalating number of accidents and incidents on surface movements is becoming one of the major airport safety concerns. Furthermore major airports are becoming, or continue to be, capacity constrained, resulting in significant delays, causing frustration and difficulties for both passengers and aircraft operators. In crisis situation, for instance due to adverse meteo, the flow management of passengers becomes chaotic leading to potentially hazardous situations. Identified solutions aim at providing accurate positioning and surveillance systems, guidance and communication capabilities in the vehicles.

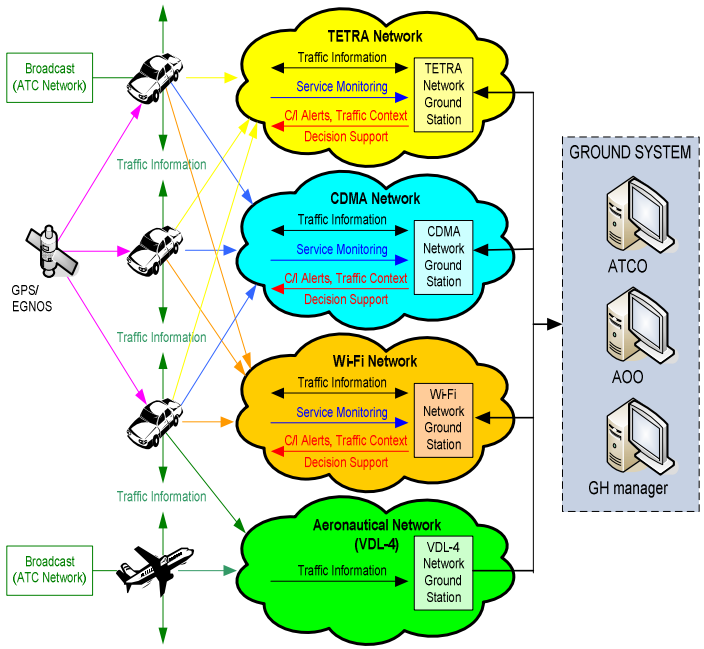


The high level objectives of AIRNET (AIRport NETwork for Mobiles Surveillance Alerting) are to:

- Prevent airport ground movement safety hazards due to vehicles, by means of an automated control tool capable of:
  - Detecting runway incursions and incursions into dangerous or restricted areas
  - Providing alarms indications both to the Air Traffic Controllers and to vehicle drivers
- Prevent airport congestion in crisis situation (bad meteorological conditions, low visibility, traffic overload, air traffic control disruption, etc.) by means of a decision making tool allowing to:
  - Monitor the vehicles resources utilisation
  - Optimise the allocation of vehicle resources, according to flight schedule modifications and to meteorological condition changes
- Prevent airport intrusions of non-authorised vehicles by means of an automated control tool capable of alerting airport stakeholders when such a situation occurs.

PRINCIPLE AND ARCHITECTURE

The AIRNET project will aim at developing and experimenting an EGNOS low-cost platform for the surveillance, control and management of airport vehicles (catering, baggage, fuel, maintenance, firemen, police, customs, etc.), and which will implement the recommendations of EUROCONTROL for A-SMGCS (Advanced Surface Movement Guidance and Control systems).

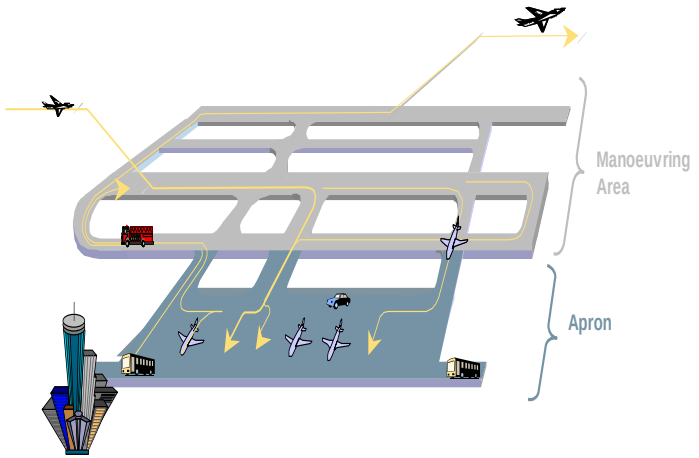


AIRNET platform will enable the elaboration of airport situation by real-time acquisition of aircraft and vehicles position through a set of wireless networks. The performances and the reliability of the wireless communication network is a key driver to the "end-to-end" quality of service.

From the ground surface movements point of view, an airport layout can be broken down into the three following segments:

- **Manoeuvring area**: composed by runways and taxiways, this area is under control of Air Traffic Control (ATC) authorities. A limited number of vehicles, together with aircraft, are operating in this area, and ground control ensures safety by maintaining adequate separation between the mobiles.
- **Apron area**: mainly composed by parking areas, it is under joint responsibility of airport operators and ATC authorities. A large number of vehicles are operating around the aircraft to support various activities: passengers transfer, goods handling, aircraft servicing, security, etc.
- **Public area**: corresponding to the arrival and departure halls, it is the interface of the airport with a variety of ground transportation means.

A schematic representation of manoeuvring / apron area is depicted below:



ADVANTAGES

- Real time traffic situation
- Interoperability with civil aviation communications (aeronautical data links)
- No interference with existing installations
- High integrity
- High peak loads in crisis situation
- Low cost per vehicle: The low-cost of the AIRNET infrastructure will make AIRNET attractive to small and medium size airports
- Integrated with ANA's Airport Operational Management System (AOMS).
- Can use the existing airport network(s) or a specific one:
  - TETRA Network
  - CDMA Network
  - Wi-Fi Network
  - WiMax (will be supported in future)

APPLICATIONS

- RUNWAY SAFETY: Service for movements in runways and taxiways areas;

- CONGESTION CONTROL: Service to airport operator to plan and manage ground movements and to cope with crisis and emergency situations;

- SITUATION AWARENESS: Provide essential and reliable information to airport stakeholders to improve safety and efficiency of the operations.

CONSORTIUM

The AIRNET project is funded by the European Commission under the 6th Framework Programme, first call of the IST priority (Information Society Technologies), strategic objective 2.3.1.10 «e-Safety for Road & Air Transport». The consortium is lead by M3 Systems (coordinator) and is built around:

- Institutions:
  - ANA - Aeroportos de Portugal: end-user airport
  - INOV – INESC Inovação (Portugal) : research laboratory specialised in telecommunications and networks

- SMEs:
  - INTUILAB (France)
  - ALITEC (France)
  - CNS SYSTEMS AB (Sweden)

PROJECT INFORMATION

The objective of AIRNET project is to address the transportation flows in the different airport areas, to define and demonstrate innovative location-based and communication-based services to enhance users safety.

For additional information please visit the project site homepage:
www.airnet-project.com

AIRNET

Airport Network for Mobiles Surveillance & Alerting

INVITATION TO THE PUBLIC DEMONSTRATION OF THE AIRNET SOLUTION,

DEAR SIR OR MADAM,

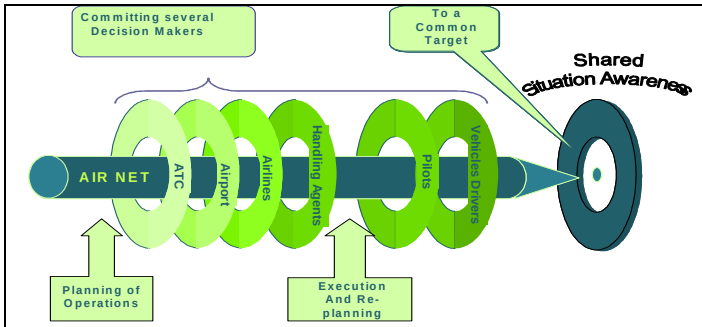
THE AIRNET CONSORTIUM INVITES YOU TO THE PUBLIC DEMONSTRATION OF THE AIRNET SYSTEM AT OPORTO AIRPORT ON XX OF XXXXXX OF XXXX.

This presentation will give a perspective of the future R&D projects in ANA Airports.

ana Aeroportos de Portugal SA

inov inesc • inovação

M3-SYSTEMS


Committing several Decision Makers
To a Common Target
Shared Situation Awareness
AIR NET
ATC
Airport
Airlines
Handling Agents
Pilots
Vehicles Drivers
Planning of Operations
Execution And Re-planning