

# Border Management Information System



*Main aspects of border management technology*

*CONCEPT PAPER*

The Border Management Information System (BMIS) is designed as an integrated system for control of passengers, transport vehicles and cargo entering and leaving the countries at border points. It aims to prevent criminal activities that appear with the increasing flow of tourism and goods between countries. At the same time the system facilitates the control of legal migration by providing border guard and customs officers with a highly effective level of service in managing migration and trade issues.

**The BMIS accomplishes the following main tasks:**

**1. Control of persons applying for visa and crossing the borders. The system provides the necessary functions for preventing from illegal migration.**

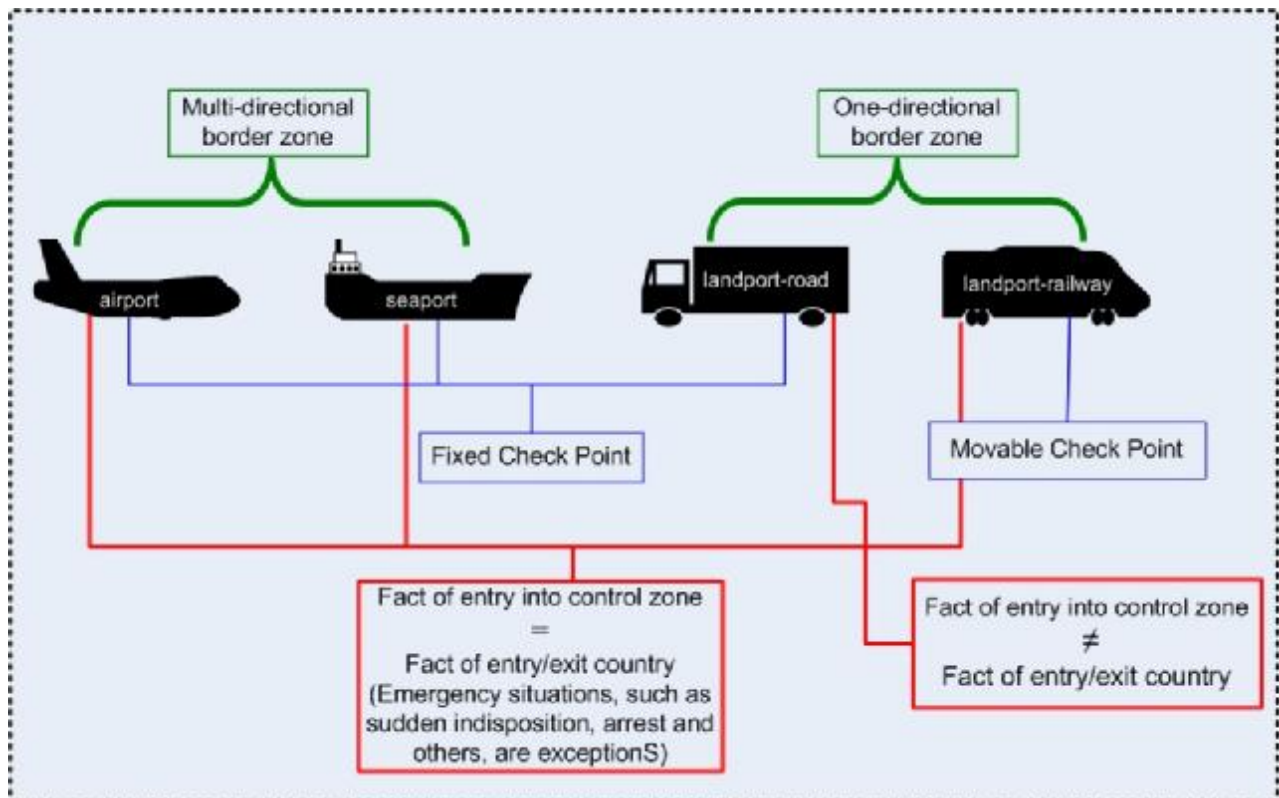
- 1.1 Identification of persons prohibited to enter the country
- 1.2 Identification of leaving country persons whose entering into the destination country must be prevented in accordance with intergovernmental agreements
- 1.3 Identification of persons who are under state investigation, Interpol lists and other watch-lists being received through intergovernmental agreements
- 1.4 Identification of persons who present invalid or suspect documents
  - documents declared as lost or invalid,
  - forged documents
  - documents previously used by a person with other personnel data
  - documents, that contain personnel data coincident with data of a person who have presented the document of another country (if these countries do not have agreement of dual nationality)
  - document twice presented on arrival, but has not been presented on departure (or vice versa). *It is especially important for land borders, as document can be more rapidly and easily passed back to be used by another person.*
- 1.5 Identification of unaccompanied under-age travellers

**2. Control of transport vehicles entering and leaving the country**

- 2.1 Identification of transport vehicles under state investigation, Interpol lists and other watch-lists being received through intergovernmental agreements
- 2.2 Identification of cargo (existence of customs seal, seal data, sealing person, cargo name, destination country) registered as transit but remaining in the country (including the transport vehicle itself)
- 2.3 Identification of transport vehicles that perform non-scheduled transportation, but frequently cross the borders and can be used by permanent transportation of drugs, etc.

The BMIS covers border crossing control and management for airport, seaport and land-border-road and land-border-railway crossing points. For each type of border-crossing the System realizes a special technological approach (for airport and seaport the technological solution is practically the same).

The following characteristics of borders are integrated into the base of the BMIS technology:



### Intelligent Mapping Technology (IMT)

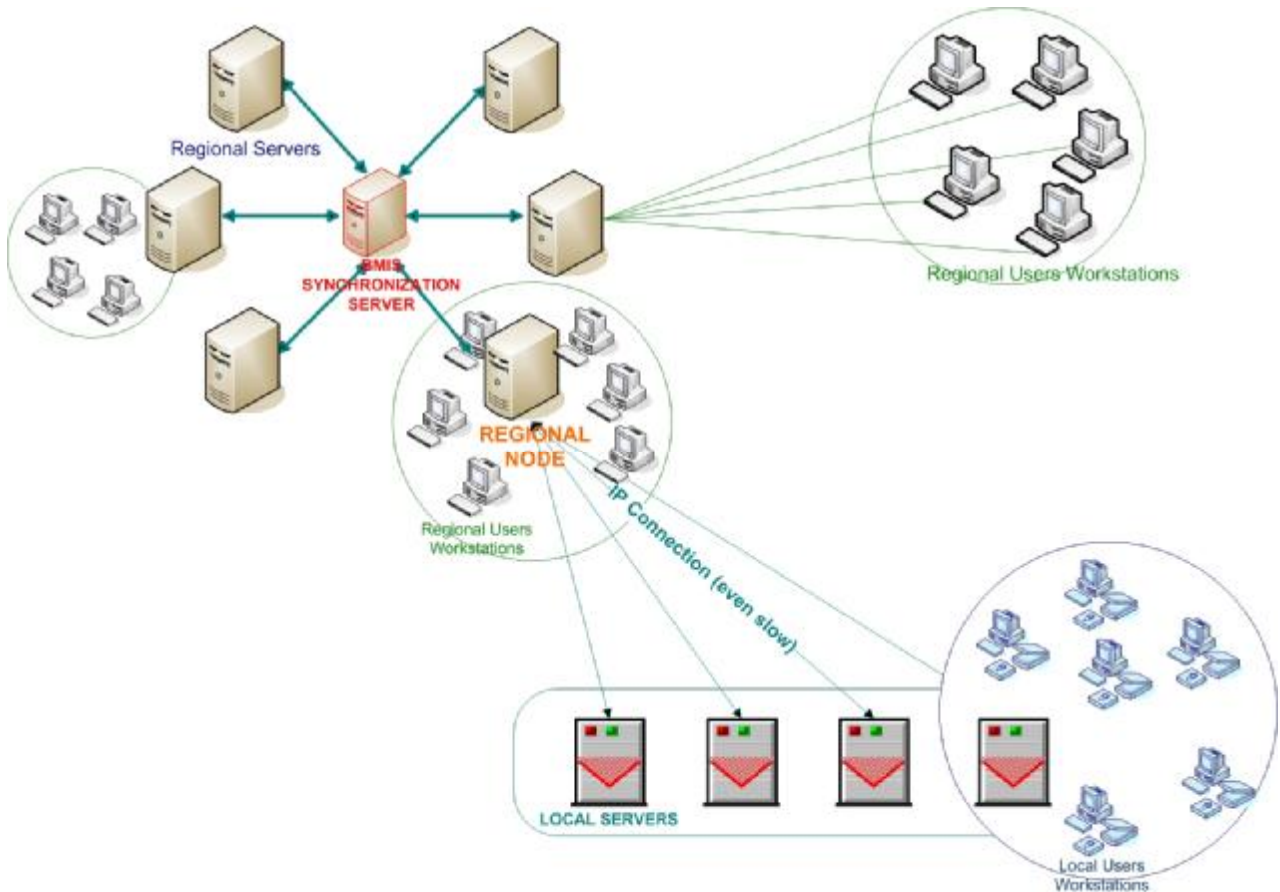
Intelligent Mapping Technology (IMT) has applied for data visualization on a map of the border zone. This technology allows the viewing of data flow on the map in a real-time regime, reviewing of data flow history, locations of data origin and change.

For border zones, where cameras are situated, technology allows to merge physical and logical data on objects.

## Servers, databases, networks, workstations

The operation of BMIS is organized by

1. Regional node
2. Local node



Regional nodes are located in the network backbones. Each regional server is connected with a group of local node servers. Data transfer between regional and local servers is realized by IP connection near real-time (every few minutes). In the case of connectivity loss, for any reason, the users continue their work on local servers to perform their functions. As soon as connectivity is restored the servers will synchronize automatically. Special data compressions allow to perform synchronization of servers in a very timely manner even with low-speed connections.

Based on security issues and tasks IP clients cannot directly access the database. However, the System provides data exchange procedures, providing low traffic level.

The Synchronization of data, collected in regional servers, is realized through a Synchronization Server, which receives, synchronizes and distributes data back to regional servers. Regional servers exactly replicate each other and can be considered as unified center. This means that instead of several regional servers the smaller countries can have one central server.

The local node clients are involved in core operational activity of border control and management. They realize real operational data entry into the system. Local clients are connected to the local

node with wire or wireless connection (wireless is obligatory for railway borders, as the check-point for these is mobile).

Regional node clients are involved in System administration, managerial data entry, renovation of watch-lists, etc. Visa issue technology is also realized on regional node servers.

### **Data storage**

The System has two levels of data storage:

- storage of general data - passenger full name, visa, transport vehicle registration number, arriving country, departing country, destination country, time of movement (regional node level),
- storage of full volume of data (local node level)

In addition to general data very detailed information on passengers, the transport vehicle and cargo is stored in second level. For example, there is a image of identity card for passengers, data on check-in perform employee, check-in desk, check-in time, boarding gate and boarding time, etc.

### **Queries**

Regional servers are able to process sophisticated queries and generate reports from intelligent/indistinct queries. Servers require being high-capacity. They realize multiple-criteria based on easy search of objects historically registered in the system. The System provides an analytical search facility of passenger flow by destination, nationality, transportation date and other parameters, for example: list of passengers frequent flying from one or other selected destinations (this is important for discovering possible trafficking), list of passengers frequently travelling with the same crew, etc. without having any initial data on passengers.

Local servers are appointed for data entry and for queries on concrete entities, cases, objects, etc.

### **Border crossing control and management**

The BMIS operation control has three levels:

1. Check of documents presented by passenger on rights and problems originated from economical and legal relationships; Special Phonetic-based search technology is integrated which allows to resolve the problem of spelling names written in different languages.
2. Verification (including biometrical) of passenger rights on presented documents
3. Check of presented documents falsifications and validity

1. Check of passenger's rights and problems originated from economical and legal relationships is based on passengers' personal data comparison with security data.

Multi-criteria check of passengers' personal data (surname, birthday, biometric data, etc) against Wanted Persons and Interpol Database, Visas Database, Database of persons prohibited to enter country and other security databases. The BMIS integrates an intelligent phonetic-based search engine: sound-like technology, as errors can occur during data entry or when the query itself is indistinct. It allows identification and presentation of names that are the similar to a stated name (similarity in pronunciation, omission of letters, etc.).

Currently, the System is installed and works in real-time regime with Armenian Border Guard, the Border Guard of Russian Federation in Armenia, National Office of Interpol, watch-list and wanted persons database of National Police. Flexible structure of the System will allow to create interfaces to facilitate the operating with databases of other law enforcement agencies.

2. Verification (including biometrical) of passenger rights on presented documents

Verification if presented document is carrier (legal owner) of the given passenger's legal rights (is not installed in the current stage).

The verification for multi-directional border zone is performed by biometrical data identification on check-in point and immediately before boarding.

(In this stage installation is specified for Zvartnots airport and Gyumri).

3. Check of presented document falsifications and validity

The BMIS integrates Document Identification System (DIS), which provides border guards with photos of the important pages of valid documents (with more than 10 times magnification facility), serial number and other formats of each document type, samples of fictitious documents, images of falsifications, serial numbers and owners' details of lost and void documents. The System allows users to get familiar with security surface and water-marks of a document, that are revealed under ultraviolet and infrared illumination or from different angles of viewing, etc.

## **Security**

The BMIS has two-levels of system Access Authorisation. Access Authorisations are distributed between

- Workstations and access control zones,
- Personnel.

For each workstation and access control zone list of operations to be performed is defined. The usage of System interfaces, not specified for the workstation, is impossible until special authorisation is granted. For IP clients, also workstation configuration check is applied.

The module of System login by personnel (the installation of this module is specified to be provided after installation of personnel management technology, in the current stage is not installed) is regulated by

- Staff orders
- Shift orders
- Password/biometric verification
- Zone access control.

An employee, who is not registered as entered in specified access control zone in the access control system, will not be granted with authorisation to work

Documents printed from system have a verification sign therefore ensuring that the hardware is authorized to print it.

Airport objects are presented on airport GIS that is based on Intelligent Mapping Technology.

The BMIS is capable of working with CCTV systems. It has capability to merge physical and logical data on objects. The physical image of transport vehicle received by the installed camera can be connected to logical data of vehicle. Selecting image on the monitor the operator will receive detailed information on the vehicle

- Arriving/departing time,
- Arriving/departing zone,
- Parking stand
- Details of loading/unloading cargo
- List of passengers
- History of flights performed by vehicle
- Other

(The module is installed only together with video monitoring system.)

## **Standard Compliance**

The System is designed and operates in accordance with ICAO recommendations (ICAO, Doc 9184 – AN/902, 1987; ICAO, Doc 9649, FAL/11-1995). Its flexible structure allows involving new standards.