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Original Article

Implementation of the Intelligent Traffic Monitoring System - The Case of Albania

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Abstract *- Transport and Communication are important sectors for the economy of any country. The social-economic impact of this sector has led to this sector being shown more and more care in terms of ensuring the most efficient management. The rapid developments in the field of ICT have created the premises to enable the deep transformation of the transport sector. In the conditions of continuous population growth, continuous increase of vehicles, continuous increase of the inventory of national roads, we have a continuous increase in requirements for increasing road safety, for the best possible control of added traffic, to avoid traffic congestions, to minimize the emission of harmful gases into the atmosphere, therefore to improve the quality of life. ICT plays an increasingly important role both in increasing the comfort and performance of vehicles, as well as in the management of the road infrastructure, enabling the increase of safety standards, the increase of performance and the quality of life itself. Now, we can make transport more efficient, safer, more environmentally friendly, and more cost-effective. ICT has enabled the creation of a national and international collaborative platform for improving safety and environmental performance. Intelligent Traffic Monitoring Systems are one of the most efficient and cost-effective tools to improve all transportation system chain component elements.*

Keywords *- Intelligent Traffic Monitoring System, ICT, Road safety, Traffic congestion, Environmental performance.*

1. Introduction

The transport sector is developing at a very fast rate, contributing to the increase in the level of employment and the increase in economic development. Nowadays, we face increased traffic, congestion accidents, travel time due to congestion, and harmful gases emitted. In these conditions, Intelligent Traffic Monitoring Systems (ITMS) play an important role in managing and configuring new mobility routes and the transport sector.

Recent advances in information technology have provided new opportunities in traffic control. The notion of an intelligent transportation system has become much more of a possibility. This applies not only to road networks, where there are new methods of conveying traffic information, directions, and warnings but also to areas such as air traffic control and activities such as public transport scheduling. [1]

Intelligent Transportation System (ITS) can be defined as a holistic, control, information and communication upgrade to classical transport and traffic systems, which enables significant performance improvement, traffic flows, the efficiency of passenger and goods transportation, safety and security of transport, ensures more comfortable traveling for passengers, reduces pollution, etc. [2,5]. Today, ITMS has become a very important tool in road traffic control in all countries with developed transport. The increasingly massive use of ICT has led to providing appropriate technological solutions to the challenges faced by traffic monitoring to ensure "intelligent" mobility, reduce congestion and emissions, and increase the reliability, punctuality and safety of road traffic.

The technical point of view is still considered the most important element in the construction of ITMS, but at the same time, in order to guarantee the most favorable solutions, it is important to include as many actors as possible in this process in this field both from the public and private sectors. Each of these actors can have its own architecture built for its purposes, applications, and internal processes. In this way, the ITMS will be able to have a more complete scheme for data collection, data preparation and provision of traffic monitoring services to end users.

ITMS uses advanced technologies to assist road infrastructure users in traffic management and vehicle control, which are constantly improving the quality of interaction between highway systems and vehicles. ITMS are systems that integrate modern ICT, telematics, and control technologies and are designed for the search and automated acceptance of the most effective scenarios for managing the transport system of a country, region, single vehicle or group vehicles to ensure certain mobility of the population to maximize the indicators of the use of roads and transport

infrastructure, improving the safety and efficiency of the transport process, comfort for drivers and transport users.

ITS systems are the solution to road transportation problems. It is directed towards reducing and eliminating human thinking and replacing humans as decision-makers. ITS developed various services, applications and systems for reducing the aforementioned bad outcomes. These systems especially manage traffic and travel, public transportation, payment process, vehicle operations, information, emergency, maintenance and construction, and control drivers and passengers with these applications. Also, these systems can help to manage vehicles, drivers, passengers, road operators and managers to reduce death, injury and accidents. [3, 4, 5]

An ITS comprises a set of technologies and applications aimed at improving transport safety and mobility, as well as increasing people's productivity and reducing the harmful effects of traffic [6]. ITS have been deployed worldwide to manage and monitor the transportation infrastructure and facilities and to support their efficient utilization. ITS is the application of Information and Communication Technologies (ICT) and management strategies in an integrated manner to enhance the efficacy and efficiency of transportation systems. ITS works better once basic transport infrastructure is in place and is regularly maintained. ITS is an excellent monitoring system and will help in identifying gaps and issues in the infrastructure and would thereby facilitate objective and data-driven planning.

Traffic management centers, also referred to as traffic operations centers or transportation management and operations centers, are key components of transportation systems management and operations. They are the heart of most freeway or limited-access highways, integrated corridor management systems, and arterial traffic signal systems supporting traffic-responsive and traffic-adaptive signal control. [7]

Intelligent Transport Systems are increasingly considered part of the solution to current and future transport challenges. They are being widely accepted as an instrument towards achieving efficient, safe and overall sustainable mobility while contributing at the same time to a better quality of life. An ITS uses information and communication technology solutions to provide integrated services related to different modes of transport. [6]

Intelligent Transport Systems are considered part of the solution to current and future transport challenges. They are widely recognized as an efficient instrument towards achieving efficient, safe and sustainable mobility. [8, 9, 10]

Mobility allows us all to enjoy a high degree of freedom and quality of life. These achievements must be ensured, but at the same time, they present us with great challenges: now and in the future, we must make transport more efficient, more environmentally sound and safer. This applies especially to road transport. If we want to keep up with the ever-increasing traffic volumes on the road, we need innovative solutions. Intelligent Transport Systems solutions utilize advanced ICT related to driver assistance, traffic management and vehicle control, which are constantly improving the quality of interaction between highway systems and vehicles. [11]

The ITS functional architecture framework could be adopted and continuously updated with the global standards, and it would provide a proper answer to the pressure of the single EU market. Implementing government policies, regulations and procedures, developing knowledge and expertise in each country, developing interconnection mobility C-ITS across the entire country and between countries, avoiding future integration costs and capitalizing on ongoing funding opportunities. [12, 13, 14]

Since the time when ITS started to be implemented, many studies have been carried out by different authors, which highlight the advantages of their implementation as well as the difficulties related to specific factors of different countries. According to them, the use of ITS has a vital role in reducing the negative environmental impact of transportation and achieving sustainable development requirements. With ITS, the negative effects caused by transportation, such as air pollution and greenhouse gas emissions, will decrease. [15,16]

Intelligent transport systems improve transportation infrastructure. Their implementation is very important because of their positive effects on traffic safety and efficiency, reducing costs. [17]

The application of ITS solutions enables a significant reduction in the negative impacts of road transport on the city environment. Due to increasing the traffic flow and limiting the congestion it is possible to reduce fuel consumption significantly, and consequently pollution. The usefulness of this kind of system is enhanced by the fact that there are more and more solutions using mobile devices. [18, 19]

The purpose of this paper is based on the situation of the traffic sector in Albania and based on other approximate models of the implementation of ITMS in different countries to suggest a proposal for a possible solution regarding the creation of an ITMS and a Traffic Monitoring Center to provide an optimal solution to the problems faced by traffic management on the roads of Albania. Further, it is the duty of the relevant institutions to evaluate and consider this submitted proposal.

This paper presents

(a) a brief description of the TMS on one of the highways of Albania,
(b) a description of the ITS implementation situation in Albania,
(c) the proposal of an architecture for the creation of an ITS in national level together with the TMC.

2. The situation of ITMS in Albania

Due to the geographical location of Albania, its transport sector is of great importance for the country's international competitiveness and economic growth. Despite many significant improvements in Albania's road network over the past two decades, its current state is still considered insufficient to promote economic and social development, ensure good connectivity between producers and consumers, and integrate Albania's economy into the European market. Furthermore, improper road design, insufficient road maintenance and unsafe driver behavior have led to serious road safety problems, with many fatal accidents.

The Albanian Road network had a total length of approximately 19,000 km in 2022. The main national road network is about 4,400 km and is administered by the Ministry of Infrastructure and Energy through the Albanian Road Authority. [20]

- The local road network consists of 4,950 km of roads,
- The municipal road network consists of 6,204 km of roads,
- The urban road network consists of 3,200 km of roads.

At the end of 2022, about 800,000 vehicles were registered and circulating on the road network in Albania, not including in this inventory several hundred thousand vehicles that are added as a result of the arrival of tourists from neighboring countries during the summer period. [27]

In the National Strategy for Development and European Integration 2030, it is emphasized that: The development of digital infrastructure, fast and very fast telecommunications/electronic communications networks is a necessity to support the entire digital transformation of the economy and innovative developments in strategic sectors such as energy, transport, industry, education, etc. as well as the radical improvement of the quality of public services. [21, 22]

Within the efforts for Albania's EU membership, the Albanian government has engaged with the European Union and several International Financial Institutions (IFI) to improve the road network in general and road safety in particular.

In addition to the continuous physical improvement of the transport infrastructure, the government wants to design and implement Intelligent Transport Systems (ITS). Implementing this strategy should help Albania's main transport corridors become part of a safe, integrated, multimodal trans-European transport system.

The main objectives of Albania pursued through ITS are as follows:

- Improving traffic safety and reducing the chances of accidents
- Improving traffic flows and mobility and reducing traffic congestion
- Improving the efficiency and predictability of goods traffic, both within Albania and internationally
- Improved enforcement of existing laws and regulations, including joint enforcement across borders
- The gradual integration of some of the Albanian transport corridors into the Trans-European Transport Network (TEN-T) through compliance with the provisions related to ITS in the European Directives and the Transport Community Treaty (TCT) signed by Albania.

With the approval of the TCT Treaty and its Strategic Framework for the implementation of ITS in the TEN-T corridors, the Government of Albania is tasked with implementing the ITS Strategy and Systems for the length of the core network.

Currently, a number of partial systems related to traffic are operational in Albania, such as the Road Asset Management System (RAMS), Road Crash Data and Analysis System (RTC), Camera Network for the Police (M-APRN), Database coordination event manager and Weather Sensors, the database of Driving Licenses and Plates, e-Penalty, etc.

In 2016, the European Commission presented a European strategy for the coordinated deployment of intelligent transport systems. The strategy recommends actions to create synergies between different initiatives and improve interoperability. [23]

The challenges behind the design and management of a system are indeed many, but one of the biggest issues is the integration between the systems and the various actors involved during the process. Appropriate use of communication technologies can help reduce this problem. However, the availability of adequate technological solutions to support intermodal transport is still below its potential in some countries.

The design and implementation of TMS in Albania have become a priority because since Albania intends to be a member of the EU, based on European Standards, the implementation of ITS systems is part of Albania's agenda towards its planned integration into the European Union as a future member state. On March 26, 2020, the European Council approved the start of negotiations with Albania for EU membership. Albania will gradually introduce ITS based on the objectives, policies and priorities defined in its National ITS Strategy and by the relevant European standards, European directives and the provisions of the Transport Community Treaty of July 2017.

As stated in the Albanian National ITS Strategy, the ITMS solution must be compatible with the EU Frame architecture to enable it to provide appropriate solutions for traffic monitoring priorities such as traffic management on the roads of Albania to guarantee safety and info mobility, monitoring of meteorological conditions for the reduction and management of accidents, avoiding traffic jams, to give a complete picture in real time of traffic, classification of vehicles, average speed, management of road lanes, etc.

On the part of the Albanian government and specifically by the Ministry of Infrastructure and Energy, within the framework of the drafting of the strategy for the Application of ITMS in-Road Transport, several audiences with target groups have been held regarding the use of these systems.

The first audience was held with the group considered "decision-makers" to assess the benefits to be gained and ways of securing funding.

The second audience was held with the end-user group or "traveling public" with the aim of creating public support for ITMS investments, educating users with new technologies and ensuring maximum benefits from the use of these technologies.

The third audience was held with the group of "implementers and operators" who will be the ones who will implement, operate and maintain these systems. The conducted audience results from unison in the acceptance of the use of these ITMS and the benefits that derive as a result of the use of ICT in the field of Road Transport.

The most appreciated issue is that the use of ITMS can and should bring traffic of vehicles with regulated speed, reduction of emissions of gases harmful to the health of the population, better air quality, optimizing traffic, reduction of traffic volume and improving road safety.

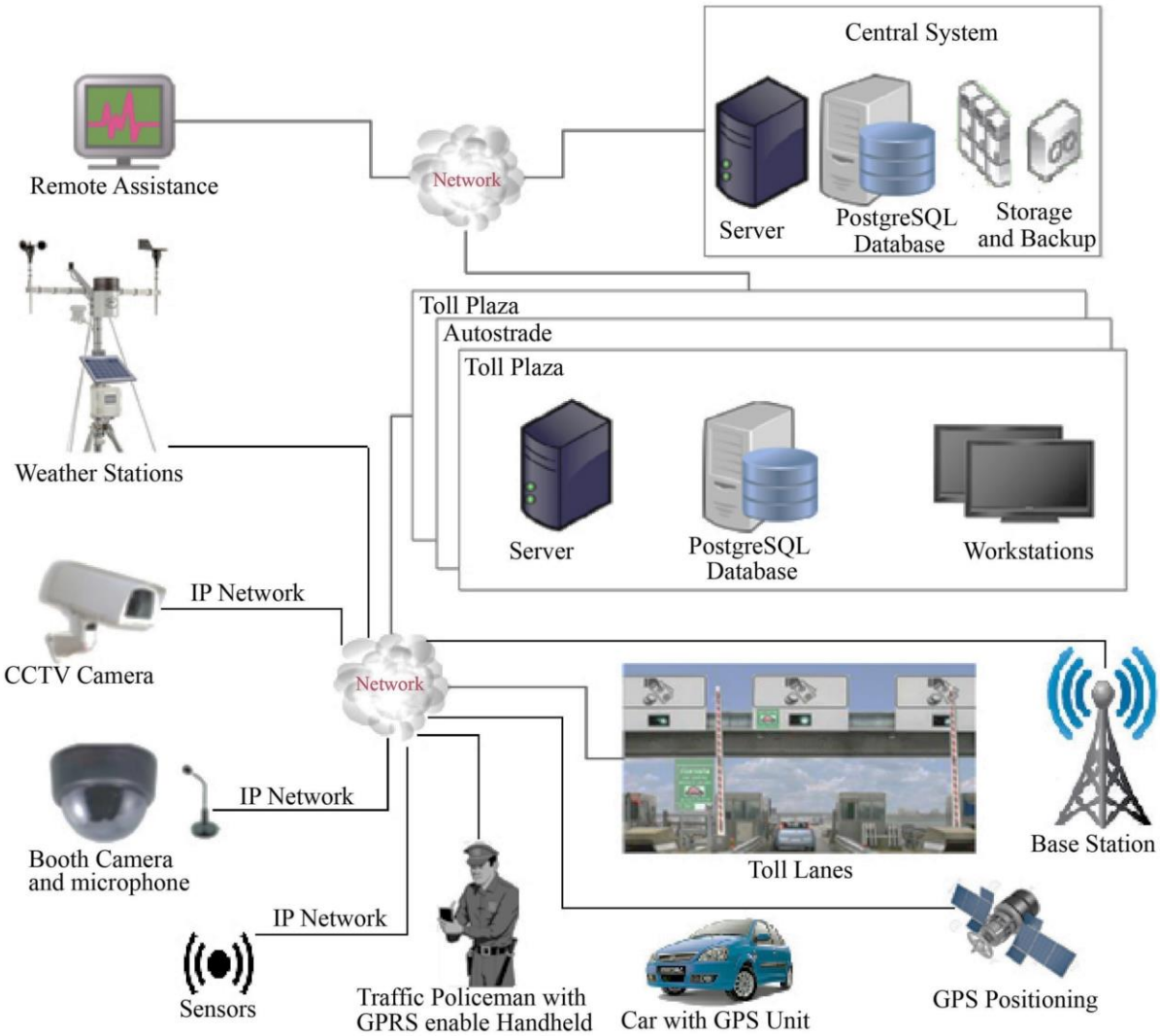

Fig. 1 Platform of intelligent traffic monitoring system on the Milot-Morina highway

Several projects have either been completed or are under development and contribute to improving the condition of roads, their ongoing maintenance, and improving road safety.

Currently, in Albania, only one ITMS is operational for one of the main automobile arteries, which is the Milot-Morina highway, which connects the Republic of Albania with the Republic of Kosovo. This analytical system for traffic management is a solution implemented by the operator who, based on the Public-Private Partnership agreement, has the right to maintain this highway for a period of 30 years.

This ITMS is based on a functional scheme that collects the necessary data from several sources, such as:

- System of sensors (speed, weight) installed along the entire highway route,
- Weather monitoring system,
- Camera system installed along this highway and inside two tunnel tubes (each about 5600 meters long)
- Traffic flow detectors
- Tools of automatic fixing of traffic violations,
- Information tables, VMS,
- Electronic payment system,
- GPS systems, etc

The above ecosystem of the ITMS on this highway is completed with an Optical Fiber network and the mobile network that serve to convey information from the peripheral devices to the central system and from the central system to the peripheral devices.

The architecture of this ITMS is organized according to the block diagram, which gives a complete picture of the ecosystem of this TMS.

3. Proposed architecture for ITMS and Traffic Monitoring Center

In the current situation in Albania, it is necessary to enable the creation of a single center which, despite the technologies used for each of these systems that have been implemented, makes it possible to integrate them into a single system to carry out monitoring as an efficient traffic control on the roads of Albania and more specifically to enable the increase of the level of safety in traffic, the reduction of costs and the increase of the speed of circulation, the reduction of the number of accidents and the degree of severity of accidents, the elimination of blockages, planning and providing road users with the most appropriate alternatives in case of possible road blockages, reducing the negative effects on the environment as a result of harmful emissions from cars that circulate, educating road users, etc.

A unification of all these individual systems in a single ITMS can and should be realized based on national, EU and international standards in guaranteeing the implementation of Security policies and the architecture of the ITMS be in line with the EU FRAME.

Based on the fact that currently in Albania, several heterogeneous subsystems are functional which are related to traffic management and related problems, the process of communication and data abstraction which will be collected from different systems, from conceptual solutions different, as well as from different technologies that presents in itself a problem which can only be solved if the convergence and integration of these subsystems are realized based on some standard rules which must be designed and implemented to achieve this integration of these subsystems.

Due to the urban and industrial developments in Albania, there is a continuous increase in traffic density on the highways, so the traffic management system has become a necessity in order to achieve several objectives related to the improvement of passenger safety, the reduction of traffic flow, prevention and minimization of accidents, reduction of duration in traffic, reduction of harmful emissions from vehicles in circulation, reduction of noise caused by traffic, awareness of passengers and vehicle drivers, etc.

These objectives are achieved through the implementation of ITMS and a Traffic Monitoring Center, which have associated the appropriate tools with generating timely warnings for traffic incidents, traffic jams, the periodic and mandatory routine works that are needed to be made on highways, warnings related to climatic conditions such as the presence of fog, rain, snow or other weather-related hazards.

At the same time, for cases of heavy traffic caused by various factors, they must be able to offer the appropriate suggestions for the reorientation of the traffic, even through alternative routes, to flexibly manage the lanes according to the predefined scenarios according to the level of service (LoS) and traffic volume.

The integrated traffic management system must be based on the collection of various types of structured data, coming from the equipment installed in the field as well as from other external systems of state or private entities (here, we can include investments made by private entities that have concluded concession contracts with the Ministry of Infrastructure for the maintenance and management of highways), to provide network operators with the tools to manage the traffic situation in real-time.

The software integration platform should cover the functionalities needed to monitor and manage highways and tunnels. The modular and scalable software architecture of the Intelligent Traffic Monitoring System is suitable for the purpose of integrating various services, partial subsystems and external central systems.

For a complete solution, it is necessary to integrate a number of subsystems and services, the most important of which are:

- Video management systems,
- Meteorological conditions monitoring systems,
- Traffic Counting system,
- Subsystem of emergency calls (SOS phone)
- Payment system (fee and payment data)
- Automatic Incident Detection System (AID)
- Variable Message Sign Management (VMS)
- Vehicle weight measurement system (WIM)
- Traffic lights
- Bluetooth / WiFi system,
- SCADA systems, etc.

Such a solution controls and monitors, in addition to the traffic, also the management systems of the facilities inside the tunnels that must be connected to:

- Power supply, including a backup system
  - Generator data
  - PCL data
- Ventilation system
- Fire detection system
- Tunnel lighting
- Air quality management system
- Emergency management system
- Radio broadcasting system
- Barriers
- Street lighting, etc.

This proposed solution will make it possible to realize:

- Processing of data collected from other subsystems as well as from external systems of other entities that are in function of improving traffic monitoring.
- Management, connection and synchronization of all systems to achieve proper and secure data exchange.
- Remote monitoring of all devices and systems.
- Drafting scenarios of various traffic events, accidents, maintenance, and lane management, as well as relevant procedures that require the performance of appropriate activities to manage normal and problematic situations.
- Creation of a database (which also uses data from other related systems) related to traffic management as well as the provision of reports necessary for the management of traffic situations (normal and/or problematic).

Based also on the technical solutions that exist in the ITMS implemented in other countries as well as in the reality that exists in Albania, a suitable and flexible proposal to provide solutions to the problems defined above is that the System Core Architecture is based on a platform designed with a multi-layered architecture that has data storage capabilities as well as monitoring tools for KPIs, monitoring and management of system services and alerts.

The claimed infrastructure or architecture must enable storage either in the cloud or on local servers of the database, which includes all the data that can be collected from the component subsystems above, but also of the data used by other systems of external but which are necessary for the normal management of traffic or even security issues.

Such an architecture is suitable to enable further expansions, which may be conditioned by situations or processes that may occur in the future, but also allow integrations in this multi-layered architecture of new systems of external entities or state authorities.

Among the layers of this architecture, we highlight the hosting layer, where the use of Kubernetes as a hosting layer that enables scaling will enable the integration or implementation of distributed systems as well as simultaneously support the automation of processes.

This architecture must also contain a common core that enables the services that this architecture or structure offers independently from the domain, such as API Gateway, Service Discovery, User, etc.

The application domain will enable all services provided on top of the platform for specific domains or solutions.
This is a solution proposed in a summary way since the concrete implementation also requires the engagement of staff who must be familiar with or have the necessary skills for managing hardware and software structures, managing traffic issues, security, technological or road infrastructure maintenance issues, etc.

This solution provides SSO technology integrated with other services based on standard technologies (OpenID, SAML 2.0, LDAP, Active Directory). User data is stored in an encrypted and secure fashion in an isolated database. This solution web APIs is a RESTful-based web service offering a set of methods that can be used to exchange data from/to the Highway and Tunnel solution environment.

Solution web APIs use Hypertext Transfer Protocol (HTTP), the standard application layer protocol for transmitting data via the internet. Objects and object data are exchanged using object models that can be serialized in XML and Json formats. C2C interfaces such as Datex2 or OCIT-C can also be utilized. For real-time communication in the case of V2X communication, we also support TLEX.

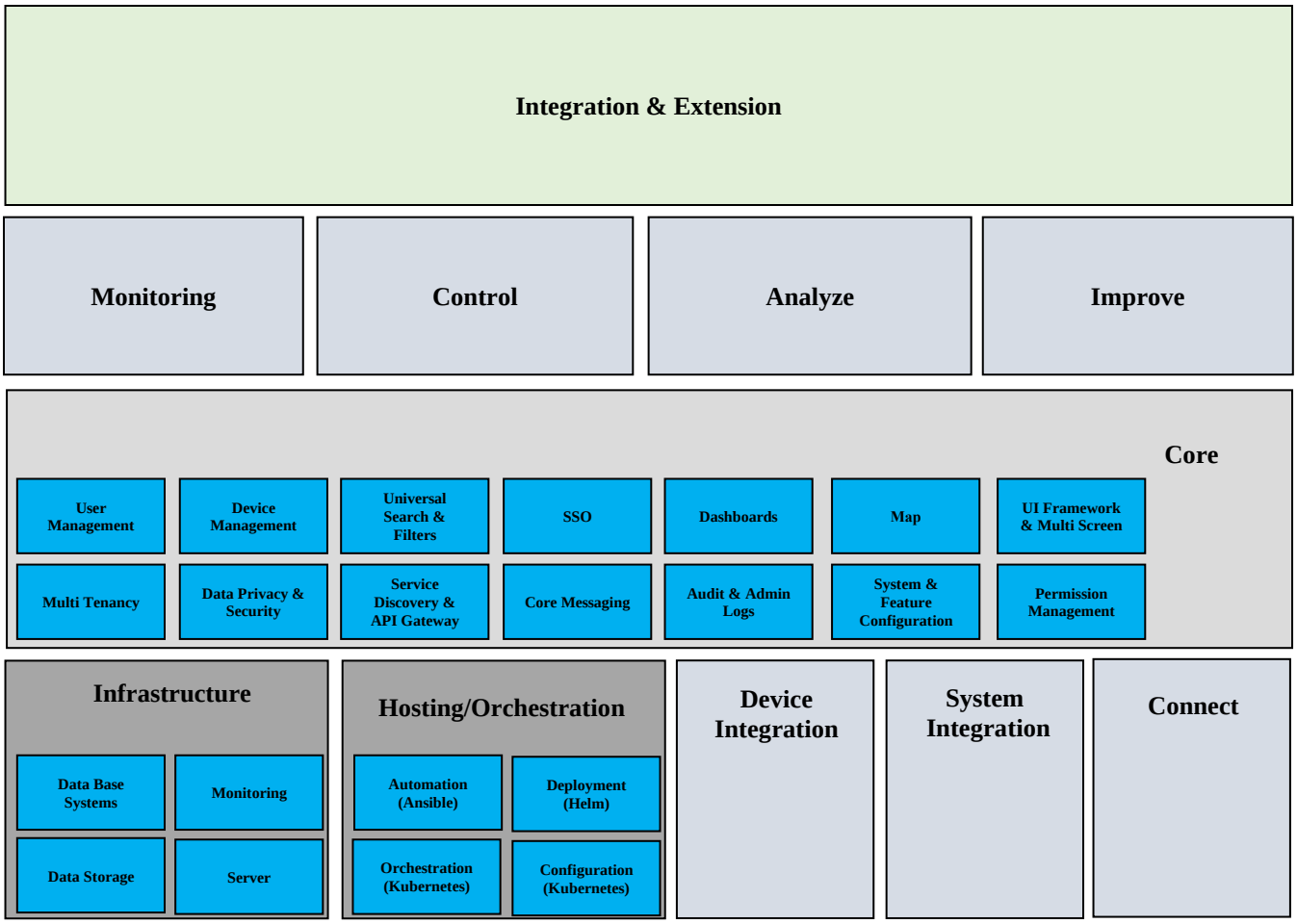

Fig. 2 Solution architecture

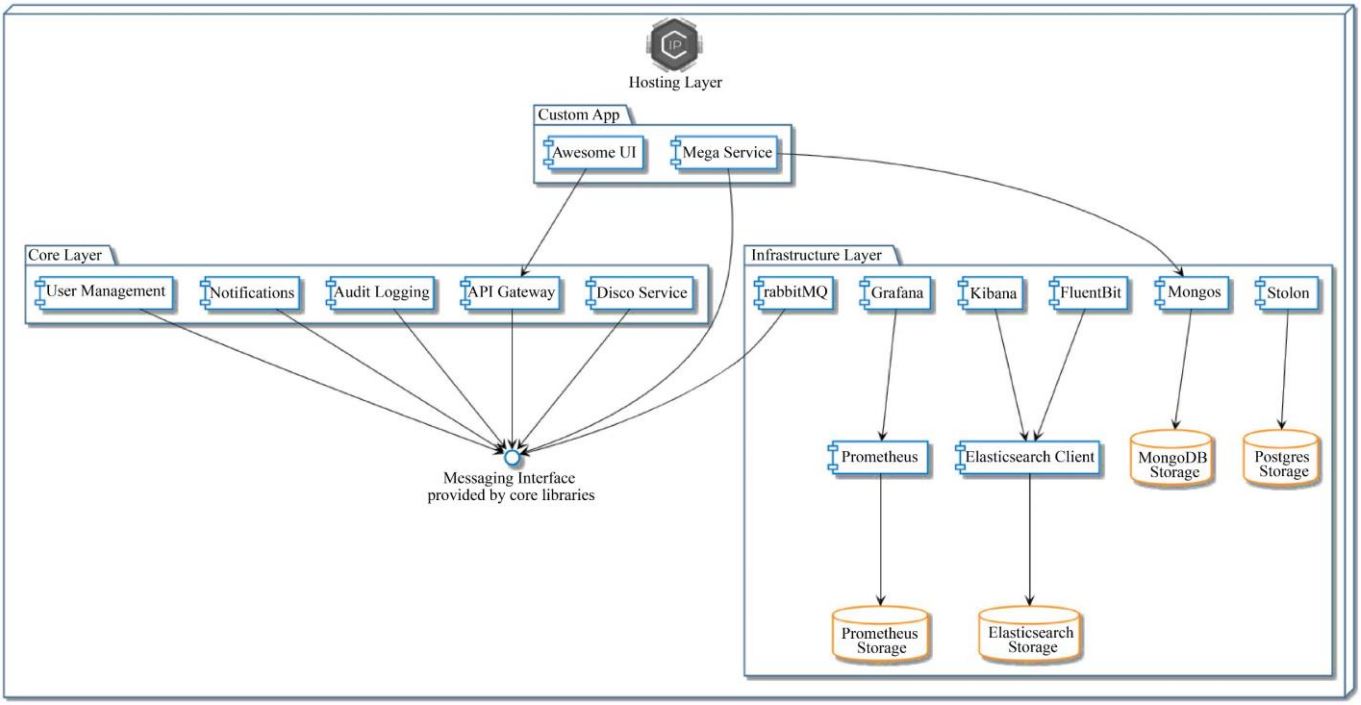

Fig. 3 Core and infrastructure architecture

Web API controllers are available for the following objects:

- Traffic Control - Controllers, Detection Units, Detectors, Measurement Stations, Movements
- Video Surveillance - CCTV Cameras, Video Based Incident Detection Units, Network Video Recorder Units
- Collective Guidance - Variable Message Signs
- Parking - Parking Houses
- Environment - Environment Sensors
- Enforcement - LPR Units
- Connected Vehicles - ITS Messages

For each possible object listed above, the Web API controllers offer the possibility to manage events and each object, to collect traffic data, and to the respective commands for each situation.

One of the main functions of implementing ITMS is the collection of traffic data which must be collected through peripheral controllers. These controllers have as their mission to collect data and then send this data to the database of the central system. In this way, this data can be used for visualization, export and backup/restore functions.

Such a system needs the connection with the systems of external entities but also with the systems of the relevant state institutions to enable the complete collection of data to realize more complete management of issues related to traffic and security.

For this purpose, the system will need to support digital inputs from traffic sensors or other types of sensors (speed sensors, 0 air quality monitoring sensors, climatic condition monitoring sensors, weighing sensors, temperature sensors, cameras, radars, etc.).

The traffic data will be used directly by the TMS at the local level, by the controller for micro-controlling and priority actions and at a centralized level, from the TMS server, for macro-control logic for dynamic plan selection.

The basic set of traffic data is supposed to be done periodically, where we can include being treated for periodic measurement, e.g., count that gives the number of vehicles that pass the sensor during the time interval and rate that represents the percentage of time that the sensor is busy.

The basic units charged for counting the traffic in one lane (measuring points) can, when necessary, be grouped together to supply counts related to the traffic flows moving in several lanes.

While the central system should provide for the possibility of grouping the data collected from different sensors through another process called "measuring stations", which allows the combination of loops connected to different controllers.

Suppose the security issues of data collection and storage are discussed. In that case, it should be noted that, in general, all data collected by the ITMS must be subject to security and privacy protection measures aligned with EU regulations. In principle, all data displayed on the front end is provided by the backend through REST APIs and can also be made accessible to third-party systems through REST or other specified C2C interfaces such as Datex2. A maximum data storage quota may be set depending on the required system specifications. Data not needed for real-time operations can be archived for cheaper storage or backup purposes. Internal databases can be extracted as database dumps as needed. Some specific data assets can also be configured for precise retention durations to manage overall data storage volumes.

Regarding System Security and Privacy, the data flow in the ITMS must pass multiple layers of security to be processed by the software. Each request will be routed through a Web application firewall that serves as the first layer. An Ingress controller that conforms to HTTPS requests must implement a second layer. A third layer of security must be implemented in our API-Gateway, which will separate the public and internal networks. Every request to our API-GW must have a valid JSON Web Token. Integrity and confidentiality will be established with the use of JSON Web Tokens.

An automated monitoring system will monitor multiple parameters of each server's system infrastructure. For example, load average, disk space and ram usage are parameters with thresholds that should be monitored 24/7. Notifications will be raised to system staff if a threshold is exceeded.

Another important aspect is how to ensure the data privacy of the ITMS since, according to the block diagram of the system architecture, they are stored in a separate database. For this reason, it is best to encrypt sensitive and traffic data with the latest algorithms, e.g. SHA-256 for one-way cryptographic transformation and TLS for client-server communication.

A high level of availability can be achieved due to the use of Kubernetes and the containerization of the microservice infrastructure. Kubernetes is a portable, extensible, open-source platform for managing container workloads and services. Multiple master and worker nodes guarantee a balanced workload for each ITMS environment.

For software security, a convenient option is to have role-based access control built into the software. RBAC allows for ensuring appropriate access rights for each user that defines service-to-service and customer-service communication.

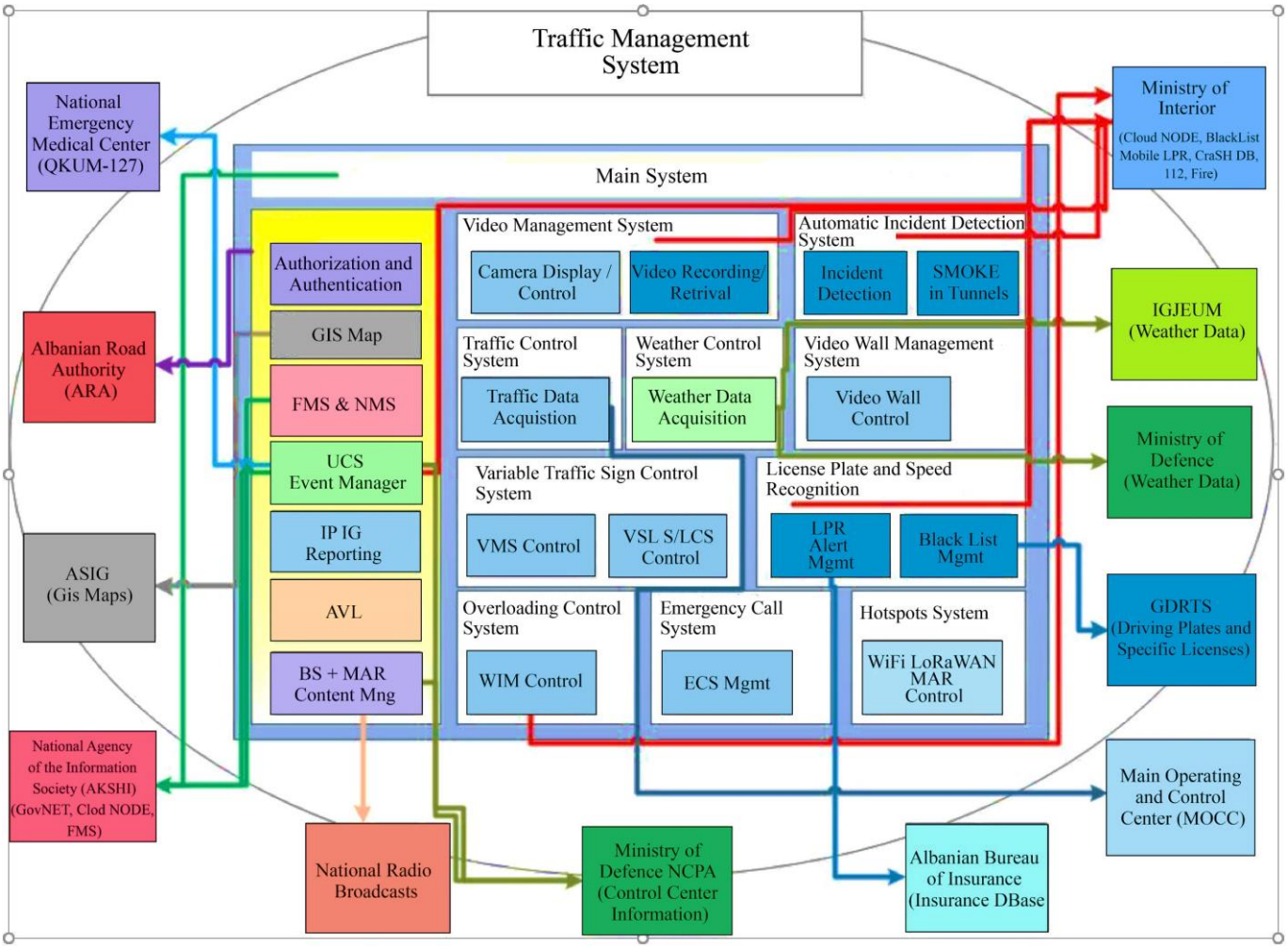

Fig. 4 Data flow architecture

4. Discussion

Regarding the importance of implementing ITMS, many studies have been carried out which emphasize the effects of their use in terms of solving traffic problems on the one hand, but also their impact in terms of the environment, the economy, the satisfaction of road users, etc.

Due to the urban and industrial developments in Albania, there is a continuous increase in traffic density on the highways, so the traffic management system has become a necessity in order to achieve several objectives related to the improvement of passenger safety, the reduction of traffic flow, prevention and minimization of accidents, reduction of duration in traffic, reduction of harmful emissions from vehicles in circulation, reduction of noise caused by traffic, awareness of passengers and vehicle drivers, etc.

The analysis of the road traffic situation in Albania based on the use of data published by the relevant state entities lays out the need to implement an ITMS and TMC in Albania. Adding here also the factors of economic and urban development, of the increase of vehicles in traffic, especially during the summer vacation season, where in Albania, according to the data of the Ministry of Tourism and Environment, only for the year 2022, 6.8 million tourists have visited, most of whom come with their vehicles, ITMS implementation becomes an emergency.

Based on solutions offered in other developed countries in Europe and the world, the proposed model is a multi-layer model, judging this model as more suitable for integrating external information systems related to traffic issues. But also as a more suitable model for extension in the future. The proposed model can serve as an inherent basis for the actual implementation, but it should be taken into consideration that for this purpose, cooperation between many actors is necessary (Ministry of Infrastructure and Energy, which will ensure the budgeting of the project, other public entities and private parties interested in the development of such a project, working groups for hardware and software integrations, etc.) who must cooperate to achieve the final goal, which is the implementation of ITMS and TMC in Albania.

5. Conclusion

Urban and industrial development has influenced the increase of automobile vehicles in circulation and, as a result, has created problems and difficulties in the traffic of vehicles despite the many investments made in the increase of road arteries.

Given the limited use of ITMS so far in Albania, interventions in this area are expected to impact the economy greatly. The use of ICT in the field of transport, whether related to infrastructure, vehicles or users, is rapidly becoming one of the most important tools to provide improvements in network capacity and the mobility of passengers and goods. Based on the experience of ITMS implementation in EU countries and other developed countries, ITMS not only increases economic productivity but also helps to increase the resistance of the transport network against damage from extreme weather, which is a consequence of climatic changes.

Data exchange in the traffic monitoring system can ensure the improvement of traffic quality, reduction of congestion, provision of alternative routes in case of congestion, reduction of accidents, reduction of transport costs, reduction of travel time, as well as reduction of harmful gas emissions from vehicles. The implementation of ITMS at the national level will help Albania's main transport corridors become part of a safe, integrated and multimodal trans-European transport system, thus facilitating Albania's entry into the European transport market and serving the needs of the citizens since the purpose of implementing ITMS not only in Albania but also in every country, is because it brings benefits to transport users and service providers, as well as to society as a whole.

The above model formulated in the summarized form can be a proposal that can help to create a unique ITMS and a TMC in Albania. The achievement of the formulation of such a proposal was made after an analysis of the ITMS on the Milot-Morina Highway (the only system implemented so far in Albania), of other partial systems related to traffic management as well as of the use cases of ITMS in other EU countries.

It is understandable that the realization of such a project cannot be done without the necessary involvement of state institutions, also due to the provision of funds necessary to cover the costs of construction, operation and maintenance of an ITMS, but also due to the necessity to guarantee the right of integration of the partial systems that have been implemented in Albania and that are related to the necessary data flows necessary for the normal functioning of the ITMS and the TMC.

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