Directive 2010/40/EU

Progress Report 2020

Malta

31/01/2022

1 Introduction

This report is being submitted by Transport Malta (TM) in accordance with Paragraph 3 of Article 17 of Directive 2010/40/EU which requires Member States to submit to the European Commission, a report every three years on the progress made in the deployment of Intelligent Transport Systems (ITS) with respect to the actions referred to in Article 17(1) following the initial five-year Report for ITS deployment in the form of a National Action Plan published on the 27th of August, 2014.

The information in this report is to be considered as guidance, and is provided by Transport Malta on an 'as is' basis where commitment for such deployment depends on the availability of funds to the Transport Authority in Malta. This report is based on the anticipated deployment of an Intelligent Transport System (ITS) and includes an updated dataset with revised timeframes for the implementation of an ITS Action Plan for Malta. Nevertheless, this Action Plan is continuously being updated to reflect any changes in the plan including any additional ITS deployment plans.

Background on The Authority for Transport in Malta

TM was established by Government through Act XV of 2009 and is the national regulator for all modes of transport; aviation, maritime and land transport.

The role of the Authority for Transport in Malta, as directed by Government is to:

- develop integrated transport policies aimed at achieving modal shifts that favour the use of public transport and safe, non-polluting strategies;
- ensure the development of an efficient, integrated and socially sustainable public transport system for the Maltese Islands, that meets the traveller's needs and expectations;
- provide an effective regulatory framework for land transport with road safety as a top priority, whilst at the same time promoting socio-economic development and protection of the environment;
- promote the maritime and civil aviation facilities of Malta and the registration of ships and aircraft under the Maltese flag;
- encourage Malta to become a maritime hub in the Mediterranean and an entree-port to the EU;
- encourage measures for the development of civil aviation and ancillary services, and in particular, of air transport services of both passengers and cargo;
- promote the efficient and cost-effective running of the administration, services and operations of ports and yachting centres locally;
- provide a solid financial base from where the Authority can achieve target returns and investments; and
- standardise practices in the transport sector in Malta, in line with international norms and with those of the EU in particular.

1.1 General overview of the national activities and projects

The implementation of this action plan, published in 2014, commenced with the provision of new road infrastructure, to create additional road capacity. This was supplemented with the

introduction of new sustainable mobility services. Due to the physical or environmental restrictions of the existing road network prohibiting or limiting road or junction widening in most cases. This was particularly the case through increased focus on the improvement in traffic management and control on existing infrastructure, and the introduction of measures which support multimodality and mass transit.

The current Government's policy aims to deploy ITS to assist in achieving a modal shift. The latter is the shift from private cars to public transport and other alternative transport modes. The deployment of an ITS would reduce the level of harmful emissions from transport, ease traffic congestion, alleviate traffic bottlenecks, reduce journey times of public transport, improve road safety and influence travel behaviour through the provision of real-time travel information. The ITS implementation plan is cognisant of the important work being carried out at a European Union level which aims to achieve European wide harmonisation and interoperability for ITS deployment of road transport. This falls within the framework of Directive 2010/40/EU and Subsidiary Regulations including but not limited to Commission Delegated Regulation (EU) no 885/2013, no 880/2013, no 962/2015 and no 2017/1926.

Phase One of Malta's ITS deployment included the laying down of the foundations for the national ITS mainframe and open system architecture. The sub-systems implemented included:

a. the deployment of the first phase of a national CCTV network, composed of various types of cameras with an array of functionalities and capabilities intended for specific uses for traffic and incident monitoring and for the facilitation of effective coordination of the deployment of emergency services
b. a Variable Message Sign (VMS) network which provides road users with indispensable real-time information on traffic conditions including traffic congestion and road closures as well as other road safety related to real-time information such as electronic lane changing information and dynamic electronic speed signs
c. a partial Urban Traffic Management and Control System (UTMC) specifically designed for Malta's road network which will introduce demand-responsive, synchronised traffic signal junctions that are capable of prioritising public transport and emergency vehicles

d. the Government also implemented a flood relief system nationwide, by tunnelling underground systems for the catchment of rainwater, to adapt Malta's national transport infrastructure to climate in line with the European Union's policy.

All of the indicated sub-systems are pilot projects in their own right, which upon deployment will be monitored to assess their individual and combined effectiveness with a view to better assess further expansion of each respective sub-system components to other areas of the road network.

1.2 General progress since 2017

As a relative newcomer to the world of Intelligent Transport Systems (ITS), Malta has seen a substantial roll out of ITS at a national level. For its small size, what is planned for ITS deployment is also substantial, both in terms of the expected impact on the transport system as well as the level of investment.

To ensure a holistic approach to planning and effective widespread deployment of ITS, it is important to examine and understand the nature of the trends and changes that have taken place in our transport system in recent years and how this has affected travel patterns and behaviour.

Through this Action Plan, Transport Malta intends to continue with the ITS deployment over the coming years to prepare for a transport system based on the "smart city" concept.

Specifically in relation to road transport, the Maltese transport system is characterised by the predominance of road-based transport, with private cars, buses, road freight, cycling and walking representing 98% of all internal travel movements in a typical day. The analyses performed through the National Transport Master Plan 2025 have led to the identification of both the strengths of road transport that can be built upon as well as the main issues and problems that need to be addressed in relation to the supply and demand for road transport, the degree of utilisation and functionality of road transport and its organisation.

Road transport infrastructure in Malta, comprises of a well-developed, strategic road network with few missing links and, in general, provides an adequate level of connectivity between the main towns and from the smaller urban and rural settlements. Malta has 3,096 kilometres of

road2,407 km (87.3%) of which are paved, and446 km are unpaved as of 2019 114 km of Malta's roads are on the Trans-European Transport Network but it has no motorways.

Another important factor impacting the road transport sector is population density. Notably, the current population of Malta is 516,000. In fact, Malta ranks 174th in the list of countries (and dependencies) by population. The population density in Malta is 1380 per km^2 (3,574 people per mi^2) compared to the total land area of 320 km^2 (124 sq. miles) Also, 93.2 % of the population is urban (411,533 people in 2020)[1]. These unique factors, along with Malta's small country size, present practical difficulties when comparing the performance of Malta's internal transport system with that of other EU countries.

For instance, the short travel distances mean that marginalisation of rural communities is not a major issue compared with most other EU countries but, the lack of high-speed, inter-regional roads in Malta naturally gives rise to slower nationwide journey times and congestion levels which are akin to congestion levels found in medium and large cities in Europe, rather than at a country level. Malta's very high road network density, ever increasing, high population density and urban agglomeration patterns result in a scarce availability of land for road network improvements, as well as conflicting needs between the road network and its surroundings.

In relation to the TEN-T key strategic sections of the Maltese road network form the Trans-European Transport Network, Malta's original TEN-T road network comprised 51km of strategic road in Malta and Gozo, main sections of which were upgraded through a series of investments supported by the European Union under successive programs since 2004. In 2013, the European Union's legislation on the TEN-T was revised and this had resulted in an extension of Malta's TEN-T road network to cover more than 112km.

The revised TEN-T network is divided into two components:

1. The Core TEN-T Network which provides strategic connections between Malta's airport, the Port of Valletta (freight and passenger) and the Port of Marsaxlokk (freight).

[1] Elaboration of data by United Nations, Department of Economic and Social Affairs, Population Division. World Population Prospects: The 2019 Revision. (Medium-fertility variant).

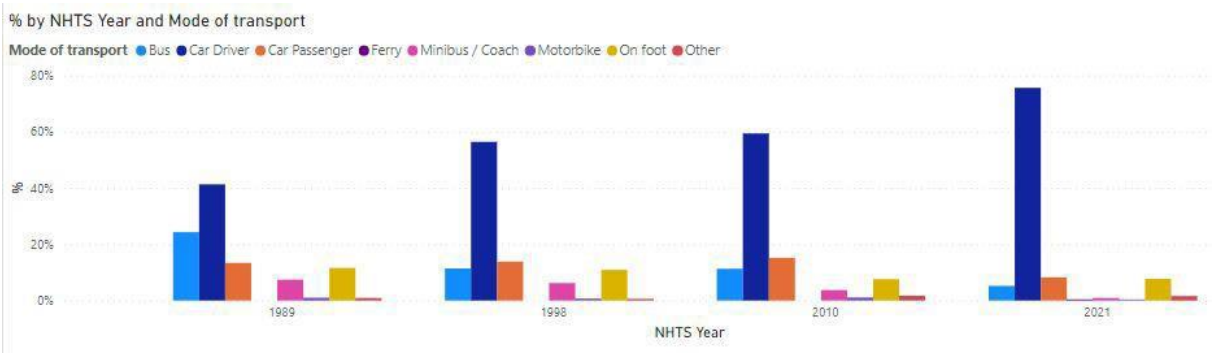
2. The Comprehensive TEN-T Network which connects the rest of the territory to the Core TEN-T network and the inter-island ferry ports of Ċirkewwa, Malta and Mġarr, Gozo.

In addition, demand analyses carried out for the purposes of the National Household Travel Survey (NHTS, 2021) have shown that, in the absence of railway or inland waterway links, domestic transport is mainly served by road. According to the NHTS (2021), the majority of car trips were made to the Northern Harbour district (47.5%) and the Southern Harbour district (33.1%). The majority of car trips originating from the Northern district were to the Northern Harbour district (37.8%) and the Northern district itself (37.2%) and these were directed to the same district.[2]

Car trips originating from the Southern Harbour were mainly to the Northern Harbour District (36.3%), followed by the South-eastern district itself (27.7%). In relation to car trips originating from the Western district, these were mainly to the Northern Harbour district (42.2%), followed by the Western district itself (20.9%). The majority of car trips originating in the Gozo & Comino district were to the same district (88.9%).

In recent years, Malta has been affected by a trend of increasing road traffic volumes. This is mainly as a result of three key growth factors: population, economy and tourism. From the demographic point of view, it is important to underline that today, people are far more mobile than they ever were in the past. From the table below it can be seen that car transportation (driver) has increased in each of the periods, particularly from 59.4% in 2010 to 75.7% in 2021. On the other hand, the use of bus transport has decreased from 11.3% in 2010 to 5.2% in 2021, largely driven by the COVID-19 pandemic. This is also reflected in the use of minibus/ coach which has decreased from 3.7% in 2010 to 0.9% in 2021. The use of walking has increased slightly from 7.6% in 2010 to 7.7% in 2021 (NHTS, 2021).

[2] NHTS Survey 2021, Authority for Transport in Malta



The predominance of road transport is confirmed by the high rate of motorization, which currently stands at 773 motor vehicles/1000 residents as at 2016 (NSO, 2020)[3]. This represents one of the highest per capita rates of the 27 EU member states. The highest increase in motorisation levels occurred in the second part of the 1990s and, although the percentage increase has reduced in recent years, the trend is still that of increasing vehicle ownership.

The increasing volume of traffic on the roads is closely associated with the year-on-year growth in private car ownership and usage coupled by full employment. Private cars account for 77.3% of total licensed motor vehicles with minibuses registering the largest increase at 11.0% over 2018 (NSO, 2020). From the direct comparison between vehicle ownership growth and demographic trend, it results that the number of passenger cars has been increasing at a rate that exceeds population growth and/or the working population.

The existence of a highly pronounced and concentrated travel demand peak is an undesirable feature in any transport system. New road infrastructure needs to be designed to accommodate these maximum traffic flows during this short period of heavy congestion. When this peak period is excessively disproportionate to the rest of the day, the cost of remedial solutions becomes artificially high, and the design solutions become increasingly difficult to find. To this end, Government is seeking to comprehensively tackle this through policies and measures aimed to improve the management of peak hour travel by private cars.

Such measures and policies include the introduction of new and innovative mobility services, which are intended to encourage car drivers to avoid the need to travel during peak hours and to use more efficient modes of transport.

[3] https://nso.gov.mt/en/nso/Media/Salient-Points-of-Publications/Pages/2021/Transport-Statistics-2020.aspx

The private car is nowadays more commonly used for very short distance trips where, in the past, walking or cycling would have been the preferred mode. This situation should be revised so that such trips and even more, shorter trips, are carried out without resorting to the use of personal passenger cars. With the commodity of the car and unrestricted free public car-parking facilities available in many localities, car travel has become the preferred modal choice for many travellers at national and inter-regional levels. The take up of cycling in Malta is relatively low (0.5%, NHTS 2021). The NHTS (2021) reports the majority of those who cycle are male (88.0%). In addition to this, most of those who cycle were between 18 and 40 years of age (44.0%), whilst those who cycle least are between 15 and 17 years old (16.0%). The majority of those who cycle are employed (64.0%).

To encourage the take up of micro mobility, Transport Malta is now registering and licensing e-Kickscooters manufactured for the purpose of being used as scooters with an auxiliary electric motor producing a travelling speed of not more than 20 kilometres per hour, which use will be limited and restricted to specific routes. This is being done in accordance with the Micro mobility Regulations (S.L.499.67).

As far as the degree of utilisation and general level of functionality of Maltese road transport is concerned, the growing level of motorisation and the increased dependency on private transport, over the years, have both led to the development of a number of traffic bottlenecks at key sections of the strategic road network.

Public transport routes and service frequency have been reconfigured and re-tuned in order to better meet today's complex mobility patterns and demands. Public transport has, over the years, rarely featured in land use planning decisions. Main development growth continued to take place in areas outside of the inner harbour regions. There has been continued, significant investment in the upgrading of bus service infrastructure, both by Government as well as by the public transport operator. For public transport to be considered as a viable alternative to the private car the quality of the facilities, in terms ofcomfort, safety, security and convenience, used for waiting and changing buses needs to be of the highest standard. Recent infrastructure investment has resulted in a significant, systemic advancement in the quality of the main bus service infrastructure.

The bus ticketing system was radically overhauled in 2015 through the introduction of the pre-paid 'Tallinja' travel card. This pre-paid ticketing system has reduced cash handling on board

the buses, speeded up boarding times (and therefore improved journey times), simplified travel planning and significantly reduced the incidence of fare theft for the transport operator, who retains the fare box.

The public transport operator provides real time data through their Tallinja App. The further deployment of real time information displays to other key parts of the bus network is now possible and the data acquired automatically during daily bus service operation through the on-board vehicle location devices and ticketing machines serves to improve service operation. The capacity to accommodate the demand for travel by bus is currently being provided through a fleet of 410 modern, lower floor, low emission (Euro 6 engine) and fully accessible buses. These buses are of different sizes and capacity and are deployed according to specific operating environment, (i.e. small buses for operation in villages where roads are narrow or on routes or at times of day where demand is low). In addition, an on-demand service has been launched.

Transport Malta's national transport model is forecasting that by the year 2025, average bus speeds will reduce to 13km/h during peak hours unless there are transport policy changes. In critical parts of the road network, traffic is expected to grow by 5-6% during the peak hours over the next ten years in a scenario with no further investment in road infrastructure, no further policies to discourage peak hour travel by car and no further implementation of bus priority measures. These make the deployment of ITS services more justifiable.

Furthermore, the provision of Intermodal Transport in Malta is available both on a domestic as well as at an international level. The existing internal intermodal transport for passengers includes:

1) land private transport and land public transport at Park & Ride hubs in Floriana and Marsa and Pembroke

2) internal maritime transport and land public transport at the quaysides in Cospicua, Marsamxett, and Sliema for maritime scheduled ferry services

3) inter-island ferry services backed by land public transport at the Mgarr and Cirkewwa ports

External intermodal transport for passengers occurs between:

1) external maritime transport and land public transport at the cruise liner passenger terminals in the Port of Valletta

2) air transport and land public transport at MIA Airport

3) air transport and maritime transport between MIA Airport and International

As far as the cruise terminal is concerned, the airport – cruise liner terminal is not direct, and the transfer of passengers is done either through the main bus terminal at Valletta or by direct bus shuttle in case of cruise trips operated by liners on a 'Home Port' basis. Also, other services are provided by 'taxi'.

External intermodal transport for freight is only provided at the main cargo terminals for both ports and the airport. No direct sea-air intermodal transport exists. Limited data continues to be available on freight movement patterns across the Maltese islands. This makes it difficult to analyse and suggest potential policy options to improve the use of maritime transport to move freight between the islands. This unclear understanding of freight movements is a challenge for the system and for the Authority.

From a demand point of view, even though some timetables e.g., those for inter-island ferries and scheduled public transport are synchronised, the real-time details of vessel timetables are not always accurate. These issues have been somewhat ameliorated as ferry service connections increased and real-time information per site was deployed.

Inner harbour ferry demand is limited to the walking distance catchment in the vicinity of the harbour. Due to the continued trend of dispersion of the population away from the harbour areas, the ability to utilise intermodal linkages as part of an efficient commute is limited. The introduction of a real-time journey, intended to be introduced in the new ITS platform indicating the synchronisation of the timetable is anticipated to improve utilisation. There has also been work done to improve cycling infrastructure, and existing ferry landing places have been improved in terms of accessibility and services.

1.3 Contact information

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2 Projects, activities and initiatives

2.1 Priority area I. *Optimal use of road, traffic and travel data*

2.1.1 Description of the national activities and projects

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

The national Vehicle Registration and Administration (VERA) system is a robust and accurate national database of licensed motor vehicles that is continuously updated with data concerning new vehicle registrations, scrapped vehicles and transfers of ownership on a daily basis. Plans are currently in the pipeline to give the VERA system a technological upgrade in order to modernise it and make it a stronger tool in the hands of TM. It is to be noted that this system is also in the process of being overhauled to include a new vehicle technology and propulsion system coming into the market, such as the various forms of electric vehicles.

Over this time, Transport Malta officials have been exposed to a number of different facets of ITS-enabled traffic management and control peripherals using computers, electronics, satellites and sensors, in-vehicle and at the roadside. Transport planners and policy makers are now starting to build up vast amounts of raw traffic and travel-related data which may be appropriately filtered and structured for research and development purposes.

The award-winning Valletta Controlled Vehicular Access System (CVA) was Malta's first foray into a standalone ITS system and, at an international level, this system was considered and

voted as a best practice solution. The CVA saw the replacement of an access charging system based on an annual, flat-fee for vehicles to enter the Capital city with a 'pay-as-you–use' system.

The Valletta CVA was launched in May 2007 and uses Automatic Number Plate Recognition (ANPR) to monitor all the entry and exit points from the city, (14 locations with over 23 ANPR cameras). The system components monitor the sites using specialized infra-red illuminating cameras and interpret the number plates of the vehicles passing the camera's field of view. This interpreted data is supplied to the imaging database on the imaging server which automatically identifies the vehicle against the national vehicle registration database, with manual verification (if necessary) and further processing. Each camera covers a field of view of approximately 1.5m and multiple cameras are utilized at several sites to ensure effective coverage. On an annual basis, the system captures between 12 and 14 million vehicles entering and exiting the zone.

The system is designed to automatically calculate the time each vehicle remains inside the assigned boundary and finally computes the fee due for access and parking based on established tariffs. Although bills are regularly sent by post, vehicle owners have the possibility to check their CVA account status by either contacting the CVA helpdesk centre or by logging into the relevant section on the CVA System website.

The system automatically registers a number of exemptions which are already fed into the system including:

1. Residency exemptions
2. Ad-hoc exemptions (one off / for a short period)
3. Special needs/disability exemptions
4. Medical and administrative exemptions
5. Public transport exemptions (related to public transport vehicles)
6. Time-based exemptions (based on specific time ranges)

The CVA system is currently being extended to also include real-time information on the availability of on-street car-parking spaces before one enters Valletta, thus reducing traffic congestion created by the search of free car-parking spaces. The real-time parking information system will be implemented for the whole of the Valletta peninsula with the deployment of on-street parking sensors. This project will be integrated with the VATIS app, which has been developed by the Valletta local council and funded by Transport Malta.

The public transport scene is seeing major improvements while facing the challenges associated with the supply and demand of Malta's transport system. Together with the development of road infrastructure, public transport service is an integral part of the national strategy for modal shift which is based on policies aimed at restraining unnecessary car use on the one hand whilst promoting the use of public transport and other sustainable modes of internal transport on the other.

The current public transport system has seen the introduction of a new fleet of ITS-enabled buses for Malta and Gozo equipped with the latest Euro VI engine technology and on-board ITS components. The new bus fleet, as a standalone measure, has significantly reduced emissions from public transport over the past years. This is combined with a matrix network of terminals and interchanges designed to facilitate nationwide accessibility. The buses are also designed for easier access to users with impaired mobility.

The public bus transport operator is now providing a modern public information system showing scheduled bus operations. The core operating system includes several ITS related components. Buses are set up with an on-board visual and audible information system to advise travellers of the next bus-stop as well as the final destination. The bus fleet is equipped with tracking devices which are linked to the operator's central control room as well as to TM's National Traffic Control Centre (NTCC) for traffic management, control, and enforcement purposes. The central control room system allows operational staff to provide an interactive input into any of the Real-Time Passenger Information (RTPI) passenger displays as and when required. Other important messages concerning route and other network updates can also be delivered in-bus electronic signage.

Parking infrastructure and availability is a nation-wide subject of concern. In Valletta the matter is of increased sensitivity also due to its historical importance being a UNESCO World Heritage Site. The Controlled Vehicular Access (CVA) referred to above was introduced in 2007 to limit the traffic entering Valletta. This was coupled by extensive pedestrianisation in the central areas of the city, close to the major shopping area. A parking scheme was also introduced in 2007 to secure parking for residents, further limiting the parking available for workers, shoppers, and visitors.

Car drivers today access Valletta and cruise for a considerable amount of time to try and find a parking space. This causes congestion, pollution and an excessive waste of resources and time. Parking management is vital in dealing with problems caused by car traffic. With the aim of improving the air quality within Valletta, a pilot project has been implemented where the public is informed of parking availability prior to entering the city.

A smart parking system, funded through the Civitas DESTINATIONS Project, has been implemented in Hastings Parking area. The system consists of sensors, cameras, wireless technology, servers and software able to manage the demand and supply of parking. The cameras map the area, refreshing every 30-60 seconds, where through the coverage of the marked parked spaces, parking availability is determined. The cameras in use do not capture footage but solely map the area.

In the upper parking area, a camera system has been installed. Meanwhile, in the lower and middle parking areas, a system of sensors has been installed on the ground where parking availability is determined based on whether the sensor is covered (with a parked vehicle) or not. The real-time information is transmitted to a VMS installed at St. Mark's Street, visible from the Valletta ring road. Commuters arriving in Valletta thus have the facility of heading straight to the parking area when parking is shown as available or avoiding going into this area and looking at alternative sites when the parking area is full.

This project has been implemented by the Valletta Local Council with the collaboration and support of Transport Malta and the University of Malta. The technologies tested have the

potential to inform the effectiveness and efficiency of parking management technologies for future extensions to the system both in Valletta and in other localities.

As part of its efforts to improve car passenger safety, Transport Malta has also introduced new legal provisions which require taxi service operations to be ITS enabled.
In-vehicle ITS deployment of peripherals and on-board nomadic devices will only be available when these devices to users are provided at source as part of a vehicle's standard installation or when such devices are included as add-on installation for existing vehicles.

All public taxi services operators are obliged to deploy a number of ITS based devices in their vehicle including:

1. A taximeter with, amongst others, such facilities as printing of fiscal receipts and acceptance of payments through the use of credit debit cards, as well as tools providing means for driver recognition.
2. Tracking devices, including transmission of tracking data via GPRS, as well as transmission of such data as ignition status, speed of vehicle and also the ability of a 24x7 automatic real-time retrieval of data through Transport Malta's central data hub.
3. An optional on-board CCTV camera which triggers automatic recording on a change of the taximeter's operating system, opening of doors or the activation of the emergency button.
4. Two way-communications system capable of operating over the GSM network to allow TM to audibly communicate with the driver through a normal telephone line.

The regulator also uses its taxi monitoring system to obtain real-time information on location, speed, and direction of the vehicles to monitor compliance of taxi operations with traffic regulations and to provide further informative data on road traffic conditions. The regulator also obtains real-time information on speed and direction of the vehicles to monitor compliance of taxi operations with traffic regulations and to provide further informative data on road traffic conditions. Recent years also saw a new examination and certification system for taxi drivers established to address both driving and social skills.

Within the framework of the Civitas DESTINATIONS project, a Sustainable Urban Mobility Plan (SUMPs) was put together for the Valletta Region which comprises the Northern and Southern Harbour regions as per NSO classification. A total of 27 localities, out of a total of 54, made up this region. The SUMP, which shall now move towards the consultation and modelling phase, has the intention to improve the quality of life and mobility of residents and tourists.

The DESTINATIONS SUMP which builds on an earlier SUMP developed for the city of Valletta, is in line with the vision and strategic goals set out in the National Transport Strategy 2050 and the National Transport Master Plan 2025 which include:

- Transport to support Economic Development
- Transport to support Environmental and Urban Sustainability
- Transport to provide Accessibility and Mobility
- Transport to support Social Development and Inclusion
- Transport to remain Safe and Secure
- Transport to work towards Improved Public Health

The SUMP development process was characterised by extensive stakeholder consultation especially with the local councils. The relevant stakeholders were identified during the baseline study and the key challenges and opportunities were identified in collaboration with the stakeholders.

The SUMP also incorporates the first Sustainable Urban Logistics Plan (SULP) developed with a focus on logistics in the city of Valletta. This exercise included research, baseline data collection and the first analysis of the current situation in the logistics sector together with a feasibility assessment of various potential solutions.

The following two EU funded projects served as a learning platform to understand and deploy electromobility practices in Malta. The EU Funded Project PROMETEUS was launched in 2017 for 54 months andended in June 2021. Its main objective was to promote e-mobility through

the analysis, exchange of knowledge and adoption of best practices which lead to the compilation of specific Action Plans that were implemented and deployed specific electromobility measures at the respective national and regional level by the participating partners.

The EnerNETMob (Mediterranean Interregional Electromobility Networks for intermodal and interurban low carbon transport systems) project fosters low-carbon strategies and energy efficiency in specific MED territories: cities, islands and remote areas. Its main objective being to draft, test and improve parallel "Sustainable Electromobility Plans" according to common standards and low carbon policies, in order to set an "Interregional Electromobility Network" connecting cities of the Mediterranean area. There are three pilot activities in which project partners from twelve countries are participating. Malta, Albania, Greece (Thessaly), Croatia (County of Primorje and Gorski Kotar) and Montenegro are involved in Pilot 1. The aim of Pilot 1 is to optimise the mileage of Battery Electric Vehicle for sea-drop trips.

2.1.2 Progress since 2017

Description of the progress in the area since 2017:

Innovation in traffic management helps make transport more sustainable, which means a transport system that is efficient, clean, safe, and seamless. The refocusing of national transport policies in order to bring about safe and sustainable mobility in 2005 coincided with the local introduction of ITS information and communication technologies to road transport.

Plans are currently in the pipeline to give the VERA system a technological refresh in order to modernise it and make it a stronger tool. Transport planners and policy makers continue to build up vast amounts of raw traffic and travel-related data which may be appropriately filtered and structured for transport research and development. In addition, efforts are made for easy accessibility and easy integration.

Set with an on-board visual and audible information system to advise public transport users of the next bus-stop as well as the final destination. The bus fleet continues to be equipped with tracking devices which are linked to the operator's central control room.

The central control room system shall allow operational staff to provide an interactive input into any of the Real-Time Passenger Information (RTPI) passenger displays as and when required.

2.1.3 Delegated Regulation (EU) 2017/1926 on the provision of EU-wide multimodal travel information services (priority action a)

Measures undertaken, if any, to set up a national access point and on the modalities of its functioning: (including information on the weblink to the NAP and discovery services available to users)

Information on the progress made since 1 December 2019:

With regards to the National Access Point (NAP), the Authority anticipated to put in place a system aimed at facilitating access, easy exchange and reuse of transport related data, in order to help support the provision of EU-wide interoperable travel and traffic services to end users. For these purposes, data is accessible on a non-discriminatory basis, in accordance with the necessary standards for exchange and reuse.

In this respect, a tender has been prepared and shall be issued in 2022 to provide a publicly accessible web portal for sharing and facilitating the access to information between the ITMS, the transport and mobility providers to third parties and the public.

The aim is to develop the multimodal component of the National Access Point (NAP), in accordance with the ITS Delegated Regulations. This Web Portal will be configurable to display certain travel-related information to the general public in an intuitive and easy to understand format.

Additional information (e.g. which data types are being provided? Have metadata catalogues been implemented? Are quality requirements being checked?):

These will be collated as part of the next phase to be completed by June 2023 for the provision of the NAP.

2.1.4 Reporting obligation under Delegated Regulation (EU) 2015/962 on the provision of EU-wide real-time traffic information services (priority action b)

Measures undertaken, if any, to set up a national access point and on the modalities of its functioning:

Reference is made to the note on same in section 2.1.3.

Where relevant, the list of motorways not included in the comprehensive trans-European road network and identified priority zones:

Not applicable at this stage.

Additional information (e.g. which data types are being provided? Have metadata catalogues been implemented? Are quality requirements being checked?):

Not applicable at this stage.

2.1.5 Reporting obligation under Delegated Regulation (EU) No 886/2013 on data and procedures for the provision, where possible, of road safety-related minimum universal traffic information free of charge to users (priority action c)

Progress made in implementing the information service, including the criteria used to define its level of quality and the means used to monitor its quality:

With regards to the description of the NAP (operational or planned), the NAP is planned to be a repository of the data categories falling under DR 2013/886 and for short-term road works regulated by Transport Malta's Road Work Permit System. At present information on Events and Road works is limited. Eventually, to ensure good coverage and quality, the NAP will have accurate location data and a time frame to show the duration of the execution time of current and future road works. The current manual-based insertion procedure for the road work permits request, will be integrated within the future developments of the NAP. Once the permit request is processed by Transport Malta, verification of the data is carried out resulting in a high degree of confidence with the quality of the data. The current temporary solution is a link directory. The permanent solution will be provided with the backend system of the new ITS platform, which is currently being scoped as part of the ERDF funded SMITHs project with implementation planned for 2022-2023.

The NAP will make accessible, data presently being collected under the scope of Transport Malta, and gradually expanded to the entirety of the national road network. Such standards will be implemented with the backend system of the new ITS platform. This is being financed by ERDF funds with implementation planned for 2022 – 2023. In addition to the above, the implementation of a DATEX node, will ensure that the measures requested by the delegated regulation will be covered by the implementation of the permanent NAP solution which shall be in place by the second quarter of 2023.

No monitoring of the NAP is currently in place. The future NAP will be built on top of the ITS Platform system allowing for data feeds to be made accessible, close to real time. The NAP shall be available in English.

Results of the assessment of compliance with the requirements set out in Articles 3 to 8 of Delegated Regulation (EU) No 886/2013:

Not applicable at this stage.

Where relevant, a description of changes to the national access point:

One NAP shall be set up to cover the requirements of all the relevant delegated regulations mentioned above in relation to Transport. The ITS Platform, currently being scoped under the ERDF funded SMITHs project, includes this NAP solution as part of its solution architecture.

Implementation for the ITS Platform and the NAP is expected by 2023. The latter will be populated with more data over subsequent years.

Additional information (e.g. sources of data used for the provision of safety related traffic information):

No exchange meeting is currently in place. Exchange mechanism is anticipated to feature as part of the system architecture of the ITS platform and subsidiary NAP solution.

2.2 Priority area II. *Continuity of traffic and freight management ITS services*

2.2.1 Description of the national activities and projects

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

Speed cameras have been permanently fixed on stretches of road that have a poor record for road safety. On the whole, the introduction of speed cameras has effectively reduced both the travelling speeds of vehicles and the number of road traffic accidents within the catchment area of the speed camera.

The speed cameras that are currently deployed around Malta are radar-based. The data relating to motorists in vehicles caught travelling in excess of the speed limit is automatically communicated from the roadside camera to an administration centre in real-time using wireless technology. ANPR software is used to match the vehicle registration plate with the registration number contained in the VERA system. The postal address of motor vehicle owner is extracted, and the fine is automatically communicated to the postal address of the registered vehicle owner.

The main objective of the CCTV Network continues to be the installation of cameras for visual monitoring of traffic conditions and events unfolding on the road network. In parallel, a few cameras also provide automatic incident detection and number plate recognition.

With regards to the VMS Network, the system continues to provide en-route real-time information to road users. The network is made up of the following:

1. 32 small VMSs, the dimensions of which are 1100mm weight by 2100mm high. A single colour matrix with yellow LEDs displays pictograms, messages and animations in full matrix. Three lines of text can be displayed with 14 characters per line (character height 7 pixels or 105mm).
2. 2 medium-sized VMSs, the dimensions of which are 1175mm wide by 3100mm high. A single colour matrix with yellow LEDs display pictograms, messages and animations in full matrix. Three lines of text can be displayed with 23 characters per line (character height 7 pixels or 105mm).

3. 47 Lane Change Signs (LCS) mainly at tunnel portals. The dimensions of the LCS are 1250mm wide by 1250mm high. The LCS have a full colour matrix with a resolution of 32x32 LEDs, a pixel pitch of 20mm, and the ability to display all traffic sign pictograms.

The main ITS functions, based on the recording of existing systems and systems under development, are listed hereunder. These functions are also included as ITS priorities within the National Transport Plan:

1. Traffic Management
2. Incident Management
3. Public Transport Management
4. Safety
5. Electronic Payment
6. Traveller Information
7. Data Warehouse Management

Additional ITS interventions in the traffic management area can provide increased effectiveness in relation to the traffic congestion in peak hours. This is being taken into account in the new ITS Platform which shall cover essential obligations of Directive 2010/40 and its delegated regulation.

2.2.2 Progress since 2017

Description of the progress in the area since 2017:

With regards to Public Transport Management, the national scheduled bus transport operation is undertaken by a separate entity which possesses its own operational control centre. To achieve an integrated transport management operation, this will be linked through an API with the ITS platform on NAP. Already, this has been integrated in the ITS tender dossiers.

Currently, Malta has a temporary NAP which is updated manually and can be found at https://geoservices.transport.gov.mt/egis

The scheduled public transport operator has introduced a mobile application which offers passengers the possibility to locate their nearest bus stop, plan their journey, and also information about the location of the buses. The system is connected via GPS technology and therefore information is given in real-time.

GIS Platform

Advances in technology have made GIS more valuable in almost every field, not least of all transport, and Transport Malta is aiming to keep abreast with technology. As the GIS technology continues to evolve and our individual systems are becoming part of a larger interconnected platform, a platform to bring together all our data, technology, processes and people together was required. In view of this, Transport Malta is continuously updating its GIS Platform not only for the use of the public and stakeholders, but most imperative for the internal use across Transport Malta directorates. The GIS Platform supports the backbone infrastructure required to facilitate and streamline processes, and to integrate isolated datasets used by the different target groups. The consolidation of operations within the directorates has facilitated transportation planning decisions by providing one common source to integrate, visualise and manipulate land, air and sea transport. This results in strengthening the harmonisation required between different modes of transport.

The platform allows an authority-wide access to GIS data based on authorised content, whereby each directorate can visualise the data they own superimposed on vector or raster base maps. Initially, Transport Malta focused on the development of the public portal. Subsequent deployments of the other services followed, where each directorate is now equipped with a service using specific tools related to the business process and datasets. The GIS Platform has mixed modes of services to cater for specific needs, captured during the first activity of the project. Such interfaces feature a group specific service for the provisioning of related specific data and tools required. Exposing web services ensures interoperability between the GIS based solutions currently deployed at Transport Malta and also with major entities in Malta

In Malta, over 90% of the Traffic Light Controlled junctions are operated in an actuated mode whereby the traffic light controller uses inductive loops located on each lane for each direction

to either increase the green time or move onto the next step. Every time a vehicle passes over, the inductive loop switch is activated, and this data is logged by the controller as a count. In this way the traffic counts are generated and stored continuously for all directions in the junction.

An imperative addition to the GIS Platform is the interoperability with the Road Permitting System. As the current permitting system - the Road Permit System is not a GIS based solution, such permits for road closures or partial road closures cannot be visualised on a map within this system. In order to mitigate this limitation, a webservice was created between the GIS Platform and Road Permitting System (RPS), to facilitate interoperability between the two solutions. This dedicated webservice, visualises the issued RPS permits on the GIS Platform by pinpointing a centroid on the Street Network with the details of the issued permits including the works, and the start and end date of the valid permit. This service is live and provides dynamic data on road works and road closures to the general public and stakeholders.

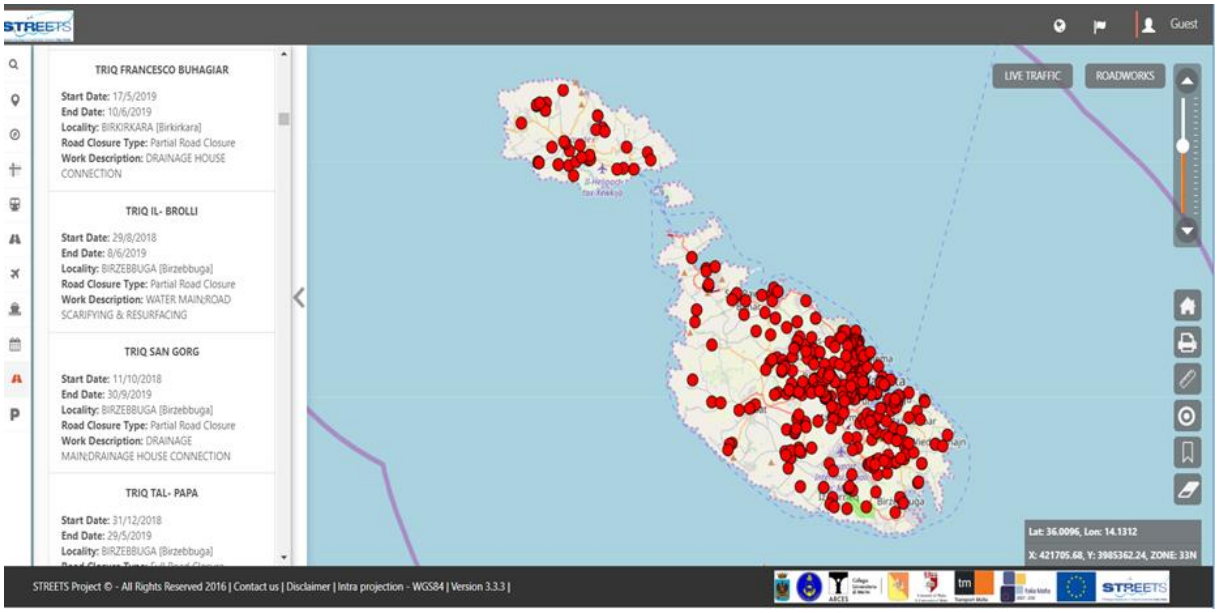


Figure 1 – Dymanic Road Closures and Road Works visualised live on the GIS Platform

2.3 Priority area III. *ITS road safety and security applications*

2.3.1 Description of the national activities and projects

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

In terms of speed limit enforcement this continues to be operational for several years and is managed by a separate private entity. The system uses Radar with Doppler effect technology to detect cars travelling at speeds over the speed limit. Images of illegal vehicles with registration number plates are sent to a control centre for processing. The data is cross-checked with the national VERA system, with the relevant penalties subsequently being issued and sent by post to the corresponding vehicle owner. This system will be integrated with the ITS Platform.

With regards to electronic payment, this relates for bus transport at present, parking operation and road pricing. At the moment, bus transport uses smart travel cards. Meanwhile, the off-street parking pricing system depends on the parking operator, while road pricing systems do not exist in Malta.

Public transport management continues to include all actions that relate to the upkeep of law and order and the enhancement of road safety in the Maltese transportation network. There are various bodies that are normally involved in the upkeep of law and order and the enhancement of road safety such as the police, private operators that carry out ANPR camera operations for Local Councils, the recently set-up Local Enforcement System Authority (LESA) and TM.

2.3.2 Progress since 2017

Description of the progress in the area since 2017:

This is in the hands of the Commission of Police, and Malta is yet to implement it.

2.3.3 112 eCall (priority action d)

Information on any changes regarding the national eCall PSAPs Infrastructure and the authorities that are competent for assessing the conformity of the operations of the eCall PSAPs:

Additional information:

2.3.4 Reporting obligation under Delegated Regulation (EU) No 885/2013 on the provision of information services for safe and secure parking places for trucks and commercial vehicles (priority action e)

Malta will not be implementing this Delegated Regulation as no such parking facilities are available in Malta. This is brought about by the fact that distances travelled in Malta by trucks are very short and hence there is no need for such facilities. In addition, Malta is not a through-traffic country for trucks since it is an island.

Number of different parking places and parking spaces on their territory:

Not applicable for Malta as per note above.

Percentage of parking places registered in the information service:

Not applicable for Malta as per note above.

Percentage of parking places providing dynamic information on the availability of parking spaces and the priority zones:

Not applicable for Malta as per note above.

Additional information: (e.g. has a national access point been set up to provide truck parking data? Does it include dynamic data? What is the source of data (public / private)? Is data published on the European Access Point for Truck Parking hosted by DG MOVE? If not, is there any intention to do it in the future?)

Not applicable for Malta as per note above.

2.4 Priority area IV. *Linking the vehicle with the transport infrastructure*

2.4.1 Description of the national activities and projects

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status: in particular, provide information on the C-ITS deployment initiatives and their technical specifications.

2.4.2 Progress since 2017

Description of the progress in the area since 2017:

This shall be implemented between the years 2022 and 2023.

2.5 Other initiatives / highlights

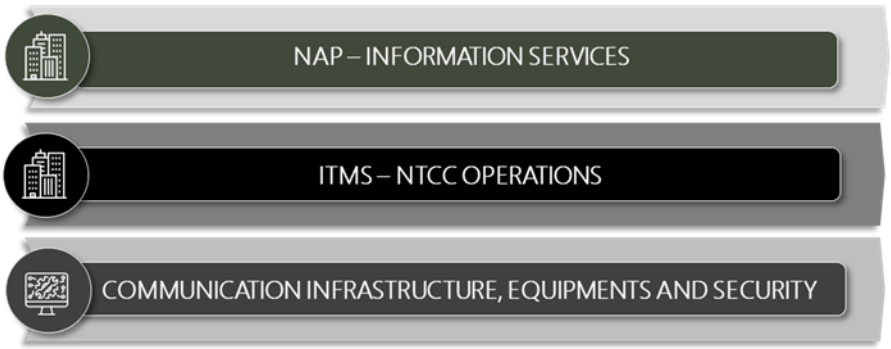
2.5.1 Description of other national initiatives / highlights and projects not covered in priority areas 1-4:

Description of the relevant initiatives, their objective, timescale, milestones, resources, lead stakeholder(s) and status:

Malta's Digital transport Architecture has been designed to support the NTCC and NAP current and future application requirements and integration, thus allowing for a scalable, redundant and highly available digital infrastructure.

Improved architecture shall now allow for the integration of existent or future complementary telematic/sensor/IoT equipment, corresponding networks in support of real time end-to-end communications with such equipment and respective security requirements. The same shall apply to the integration of other Operation Centres and with the expected increase in the number of users.

The basic lay out of this approach is presented in the following picture.



Three tender dossiers have now been drafted for the provision of an ITS Platform and the establishment of the NAP, which shall lay the foundations for the future integration of all elements covered by this Directive, are set to be issued in the first quarter of 2022 with implementation aimed to be completed by the second quarter of 2023.

2.5.2 Progress since 2017

Description of the progress in the area since 2017:

Since 2017, the Authority has continued to enhance peripheral systems such as the VERA and GIS systems whilst preparing for the issuing of tender dossiers for the installation of a new ITS platform that is able of integrating data in alignment with the requirements of Directive 2010/40.

3 Key Performance Indicators (KPIs)

Note: ***The EC document on "ITS KPIs for the EU" is to be used for comprehensive definitions of the KPIs and further guidance. The EU EIP Activity 5 report on "ITS Deployment and Benefit KPIs definitions" is a complementary document providing in particular estimation methods.***

KPI will be reported separately by type of road network / priority zone / transport network and nodes (when appropriate).

3.1 Deployment KPIs

3.1.1 Information gathering infrastructures / equipment (road KPI)

- Information gathering infrastructures / equipment means any road based or mobile ITS enabling traffic monitoring, weather or environmental conditions monitoring, emissions monitoring, or forecasting of traffic conditions. It includes for instance sensors, cameras / CCTV and traffic control centers.
- CCTV - Length of road network type /road sections (in km) equipped with information gathering infrastructures: **7km**
- Traffic Lights – Length of road network type/road sections (in km) equipped with information gathering infrastructure: **42.8km**
- Speed Cameras - Length of road network type/road sections (in km) equipped with information gathering infrastructure: **3.9km**

- VMS - Length of road network type/road sections (in km) equipped with information gathering infrastructure: **4.05km**
- Total length of this same road network type (in km): **211Km**.
- KPI = (kilometres of road network type equipped with information gathering infrastructures / total kilometres of same road network type) x 100 :**27%**

Current Traffic Lights visualised on the GIS Platform.

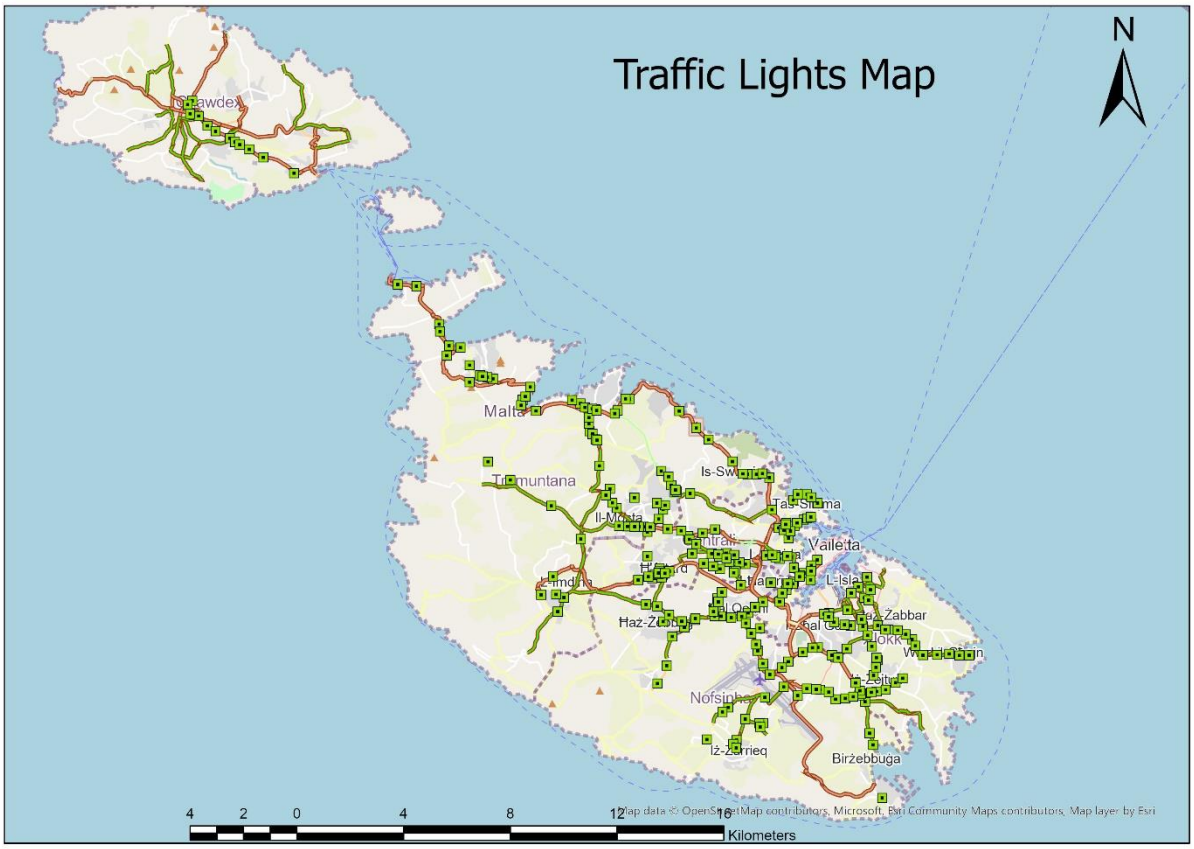


Figure 2:Current Traffic Lights visualised on the GIS Platform

Current Speed Cameras visualised on the GIS Platform.

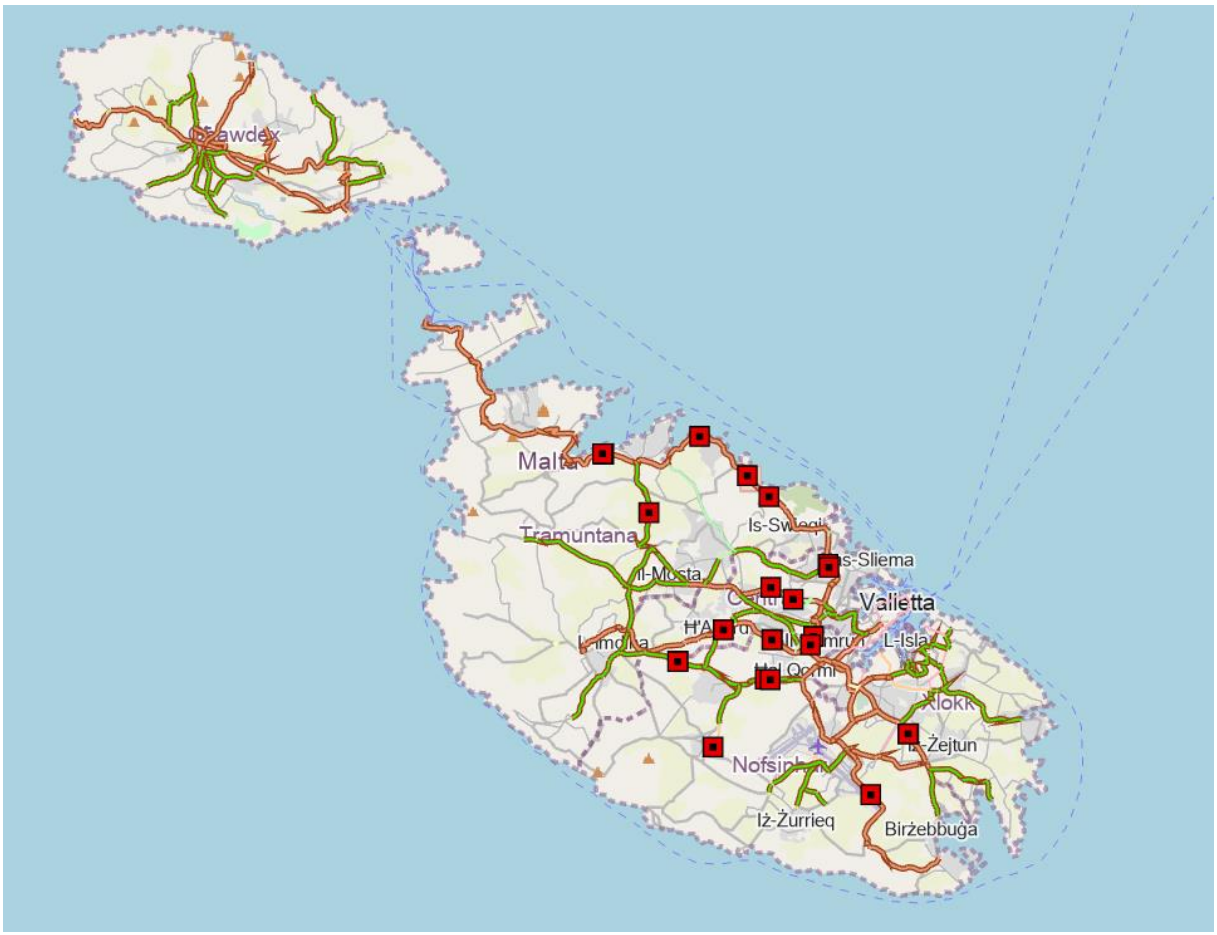


Figure 3 - Speed Cameras in Malta

3.1.2 Incident detection (road KPI)

Figures to be provided by type of network / zone.

KPI to be calculated by type of network / zone (when relevant).

- Length of road network type / road sections (in km) equipped with ITS to detect incident & Total length of this same road network type (in km):

- KPI = (kilometres of road network type equipped with ITS to detect incident / total kilometres of same road network type) x 100

This is currently achieved through the viewing of CCTV footage but will be enhanced with the planned A1-B1 tools of the ITS platform. Transport Malta monitors accidents through live CCTV. TM Control Room Officers disseminate accidents and traffic related information to the general public through a Community App.

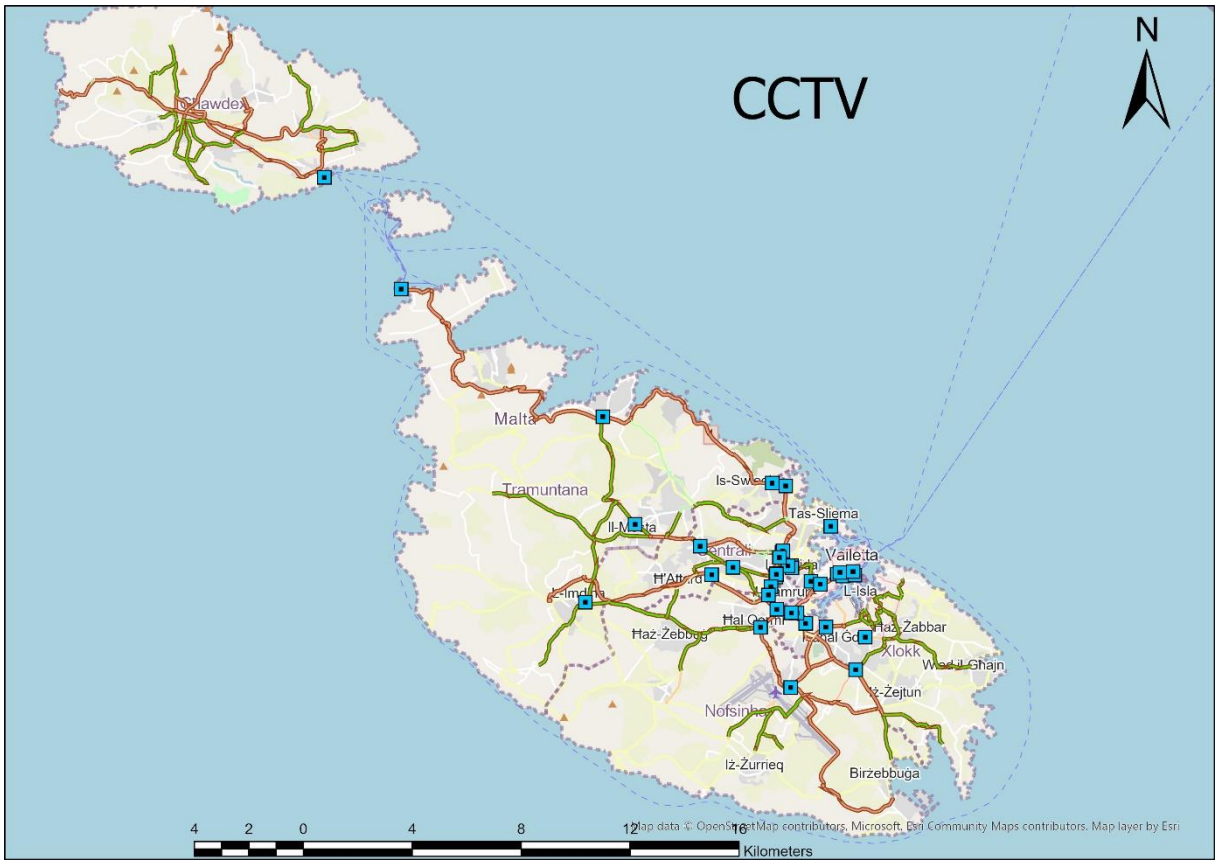


Figure 4:CCTV cameras covering the Maltese Islands

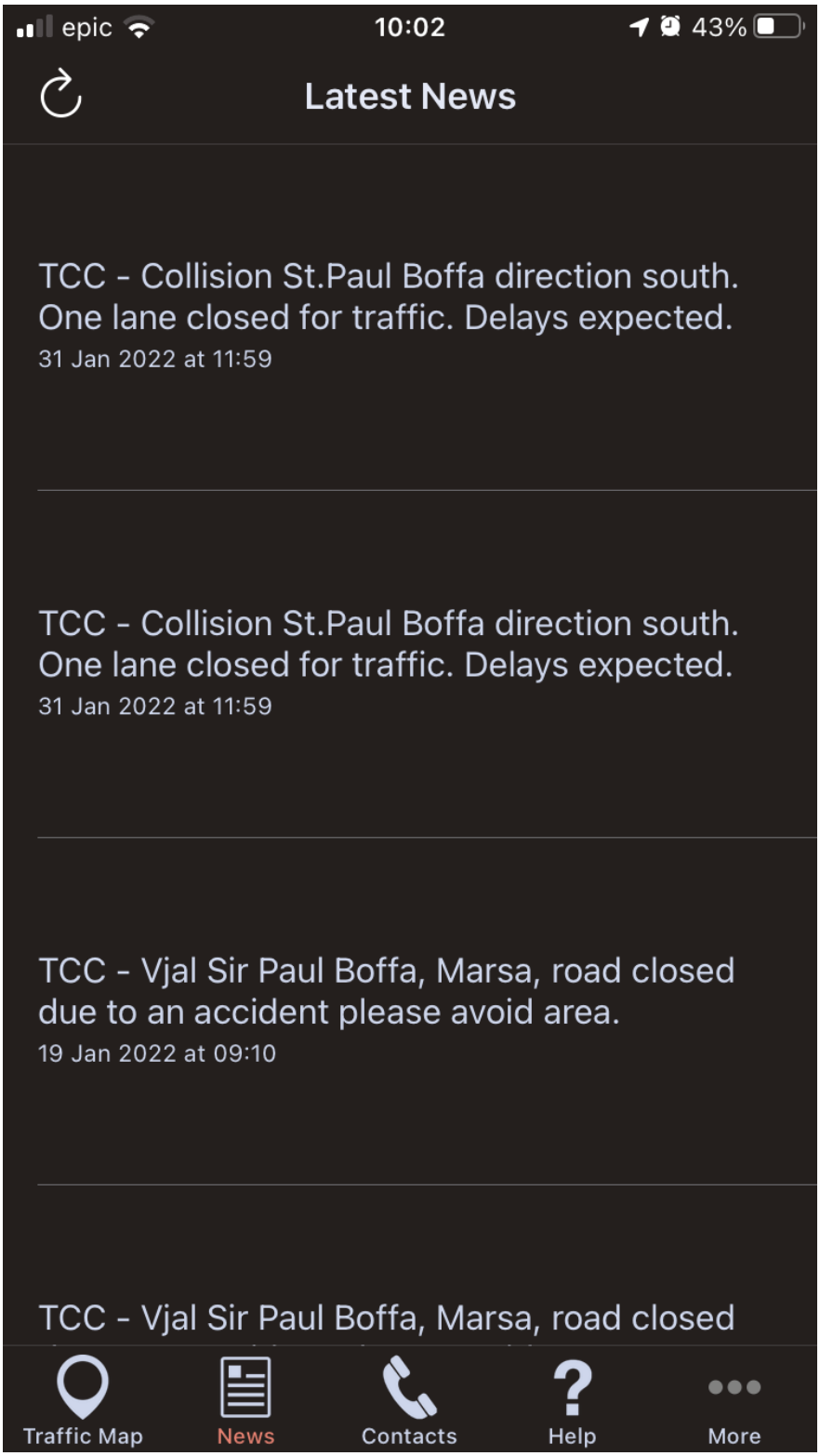


Figure 5 - Community App to disseminate Traffic and Accident Information to the general public

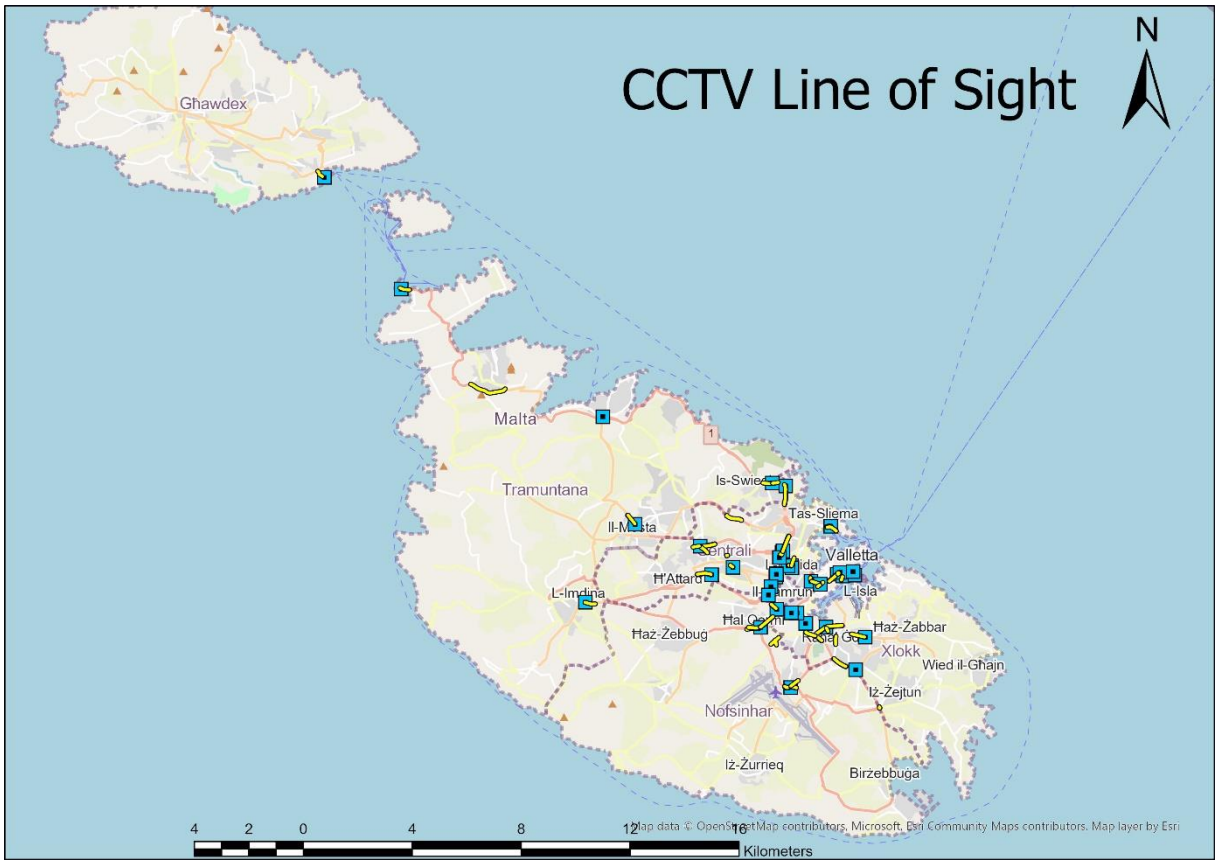


Figure 6- CCTV Line of Sight

3.1.3 Traffic management and traffic control measures (road KPI)

Figures to be provided by type of network / zone.

In Malta the Traffic Management and Traffic Control measures in place are CCTV, Speed Cameras, VMS and Road humps.

Current VMS (Variable Messaging System) visualised on the GIS Platform.

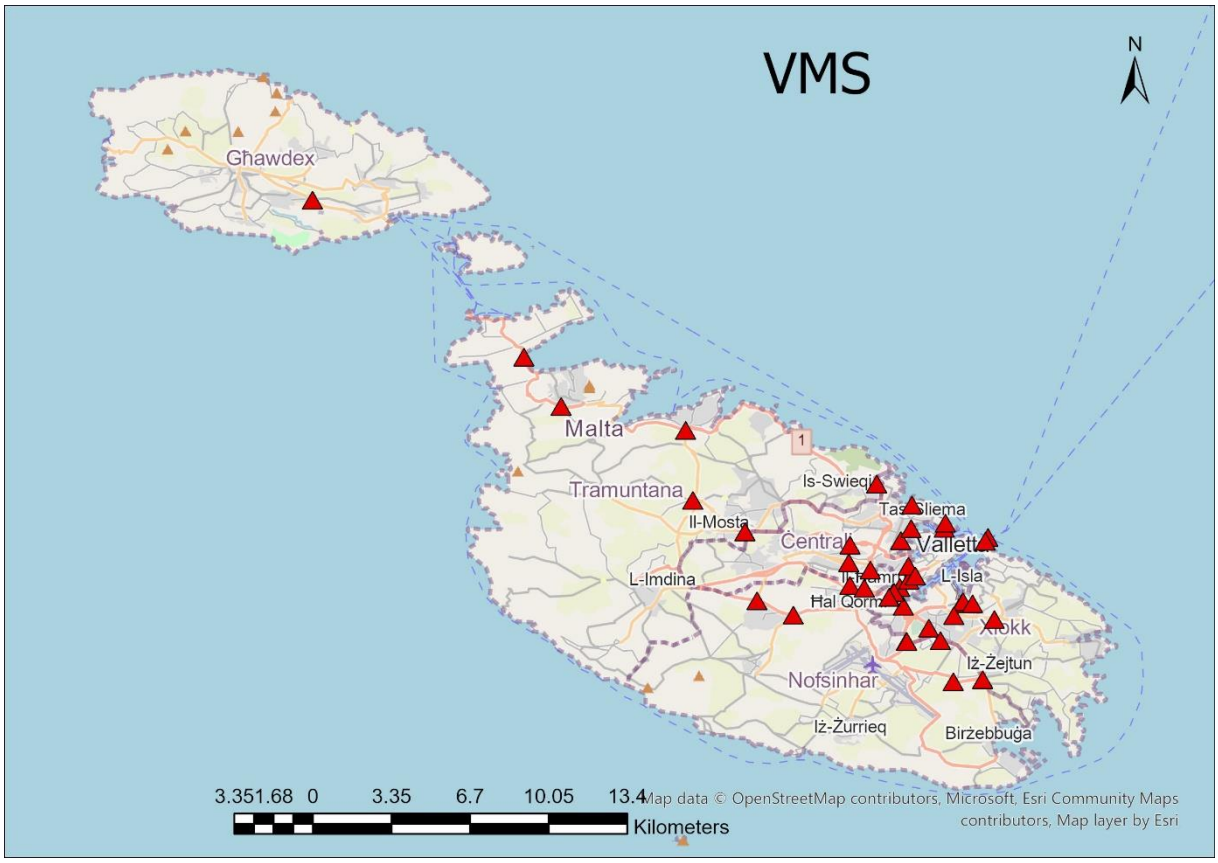


Figure 7:Current VMS (Variable Messaging System) visualised on the GIS Platform

KPI to be calculated by type of network / zone (when relevant).

- Length of road network type / road sections (in km) covered by traffic management and traffic control measures & Total length of this same road network type (in km): 13.4

- KPI = (kilometres of road network type covered by traffic management and traffic control measures / total kilometres of same road network type) x 100

3.1.4 Cooperative-ITS services and applications (road KPI)

Figures to be provided by type of network / zone.

KPI to be calculated by type of network / zone (when relevant).

- Length of road network type / road sections (in km) covered by C-ITS services or applications & Total length of this same road network type (in km):

- KPI = (kilometres of road network type covered by C-ITS services or applications / total kilometres of same road network type) x 100
  To be updated once the new ITS system is installed.

This will be applicable as of next report after the ITS is implemented. The latter is planned to be completed by the third quarter of 2023.

3.1.5 Real-time traffic information (road KPI)

Real time traffic information is already highlighted in the previous sections. Transport Malta provides incident and traffic warnings to the public on an application, and any permits of road works/road closures visualised on the GIS Platform.

Figures to be provided by type of network / zone / node.

KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.

- Length of road network type / road sections (in km) with provision of real-time traffic information services & Total length of this same road network type (in km):

- KPI = (kilometres of road network type with provision of real-time traffic information services / total kilometres of same road network type) x 100

  This will feed into real time traffic information service when coupled with other systems such as CCTV network.

3.1.6 Dynamic travel information (multimodal KPI)

Figures to be provided by type of network / zone / node.

KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.

This would be possible once the new ITS/NAP system is in place.

- Length of transport network type (in km) with provision of dynamic travel information services & Total length of this same transport network type (in km):

- Number of transport nodes (e.g. rail or bus stations) covered by dynamic travel information services & Total number of the same transport nodes:

- KPI = (kilometres of transport network type with provision of dynamic travel information services / total kilometres of same transport network type) x 100

- KPI = (number of transport nodes with provision of dynamic travel information services / total number of same transport nodes) x 100

The dynamic bus stops information is being compiled and shall be integrated in the ITS platform.

3.1.7 Freight information (multimodal if possible or road KPI)

Figures to be provided by type of network / zone / node.

KPI to be calculated by type of network / zone / node (when relevant), and if relevant indicate the proportion of services accessible to passengers with reduced mobility, orientation and/or communication.

- Length of road network type / road sections (in km) with provision of freight information services & Total length of this same road network type (in km):

- Number of freight nodes (e.g. ports, logistics platforms) covered by freight information services & Total number of the same freight nodes:

- KPI = (kilometres of road network type with provision of freight information services / total kilometres of same road network type) x 100

- KPI = (number of freight nodes with provision of freight information services / total number of same freight nodes) x 100

This will be applicable after the next report after the ITS is implemented. The latter is planned to be completed by the third quarter of 2023.

3.1.8 112 eCalls (road KPI)

Not applicable at this stage.

3.2 Benefits KPIs

3.2.1 Change in travel time (road KPI)

Figures to be provided also include vehicle.km for the route / area considered

KPI = ((travel time before ITS implementation or improvement – travel time after ITS implementation or improvement) / travel time before ITS implementation or improvement) x 100

3.2.2 Change in road accident resulting in death or injuries numbers (road KPI)

Results shall be provided / aggregated at national level to be representative enough. If possible, distinction can be made between accidents resulting in deaths, serious injuries or slight injuries.

Figures to be provided also include vehicle.km for the route / area considered.

NB: The below is not applicable at this stage since the ITS deployment is yet to be completed. Studies are being simultaneously undertaken to understand better the impact of such deployment once completed, and Malta will be able to revert with progress information at that stage.

- Number of road accident resulting in death or injuries before ITS implementation or improvement:

  This will be applicable as of next report after the ITS is implemented. The latter is planned to be completed by the third quarter of 2023.

- Number of road accident resulting in death or injuries after ITS implementation or improvement:

  This will be applicable as of next report after the ITS is implemented. The latter is planned to be completed by the third quarter of 2023.

3.2.3 Change in traffic-CO2 emissions (road KPI)

Routes / areas where ITS has been implemented or improved should be specified. Length along / area within which the change in CO2 emissions is calculated should be long / wide enough to be representative.

KPI = (traffic CO2 emissions before ITS implementation or improvement – traffic CO2 emissions after implementation or improvement) / traffic CO2 emissions before ITS implementation or improvement) x 100

NB: Malta will be in a position to provide this data following ITS implementation in the second quarter of 2023.