

# THE NATIONAL ITS ACTION PLAN FOR MALTA

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2013- 2017

**MEMBER STATE**

Malta

**NAME OF ORGANISATION**

Transport Malta

**TYPE OF ORGANISATION**

National Transport Authority and National  
Transport Regulator

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# INTELLIGENT TRANSPORT SYSTEMS IN MALTA

## Report on the implementation of the National ITS Actions 2013-2017

As required by the European Union Directive 2010/40/EU

January 2013

## Executive Summary

This Intelligent Transport System (ITS) Action Plan is a synthesis of how Transport Malta intends to roll out Malta's first major ITS deployment which is split in two phases and spanning over an eight year time frame. The first phase will take place between 2013 and 2017 while the second phase will be carried out in the following three years, from 2018 to 2020.

The preparatory work for this Action Plan had started back in 2005 at a time when the focus of national transport policy started to shift from new provision of infrastructure (in order to create additional capacity) to sustainable mobility through better management of traffic on using existing infrastructure, as physical or environmental restrictions of the road network preclude existing road or junction widening. The Action Plan builds on Malta's experience over the past seven years of successfully piloting and operating a small number of independent road-based ITS applications, providing missing components and developing Malta's ITS in a more integrated and holistic manner. The current national transport government policy aims to deploy ITS to achieve modal shift onto public transport and reduce the level of harmful emissions from transport, easing traffic congestion, alleviating traffic bottlenecks, improving journey times of public transport, improving road safety and influencing travel behaviour through the provision of travel information.

The ITS Action Plan is cognisant of the important work being carried out at European Union level which aims to achieve European wide harmonisation and interoperability for ITS deployment of road transport and takes into consideration practical deployment guidance emanating from the *EasyWay* project.

Malta's ITS Action Plan has been developed within the framework of the six main priority areas split into a number of actions contained in Directive 2010/40/EU which will be carried out over a seven year time frame.

Phase 1 (2013-2017) of Malta's ITS deployment includes the laying down of the foundation for the national ITS mainframe and open system architecture. The main system is divided into a number of sub-systems that form part of a comprehensive and holistic Urban Traffic Management and Control (UTMC) system that is tailored to the specific needs of the Maltese Islands, focusing at a strategic level on Malta's TEN-T Core and Comprehensive networks. Innovation in traffic management will help to make transport more sustainable, more efficient, cleaner, safer and seamless.

The various sub-systems planned in Phase 1 of the ITS Action Plan, will be inter-connected through a main communications system, the sub-systems will include:

- a. a state-of-the-art 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 dynamic message sign network which will provide road users with indispensable real-time information on traffic conditions including traffic congestion and road closures as well as other road safety related real time information such as electronic lane changing information and dynamic electronic speed signs in specific areas;
- c. an electronic parking guidance system which will give real-time information on the approach roads to Malta's three main Park and Ride facilities;

- d. an 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 giving priority to public transport and emergency vehicles.
- e. a road flooding alert management system will be rolled out in the most vulnerable road sections prone to flooding.

All of these sub-systems are pilot projects in their own right which following deployment will be monitored to assess their individual and combined effectiveness with a view to the possible further expansion of sub-system components to other areas of the road network. The planned UTMC has been designed to interface with all existing ITS applications used in traffic and vehicle management in public transport services, taxi services, speed cameras, Controlled Vehicle Access System (CVA) and the new National electro-mobility network.

Through this deployment and because of the small and manageable size of the transport network, Malta will be one of the first European countries to have all of its main road network, its transport hubs and termini seamlessly connected in real time at a national level. The roll-out of ITS at national level in the first phase will generate vast quantities of raw travel and traffic data which can be filtered and structured to provide a vital monitoring and assessment tool for transport planners and operators, emergency services, policy makers and control bodies.

Initial preparations are already underway for the second phase of the ITS Action Plan which envisages further enhancements and additions to Phase 1 as well as its extension to Malta's urban core areas. The main aims of Phase 2 will be to further improve public transport efficiency, road safety and air quality.

Transport Malta shall carry out a mid-term review of this Action Plan towards the last quarter of 2015 to assess the results achieved during Phase 1 of deployment.

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Freeport  
Airport  
Luqa

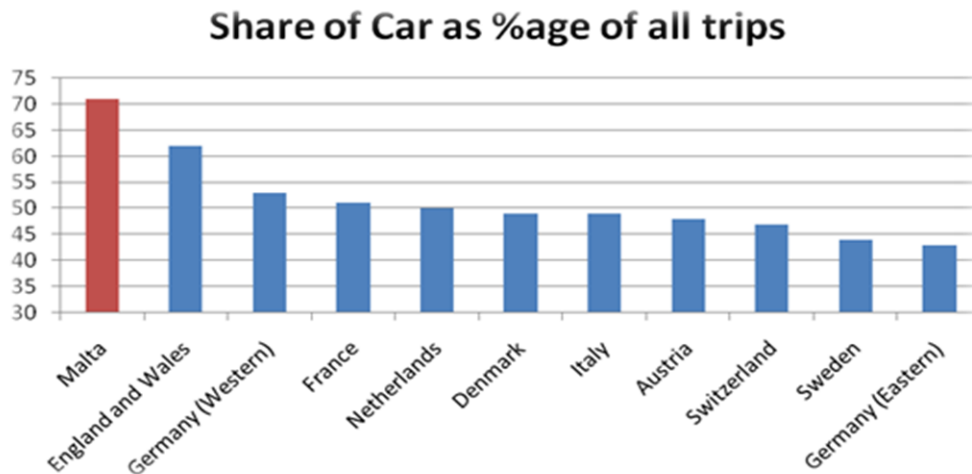
Gozo  
Valletta  
Qormi

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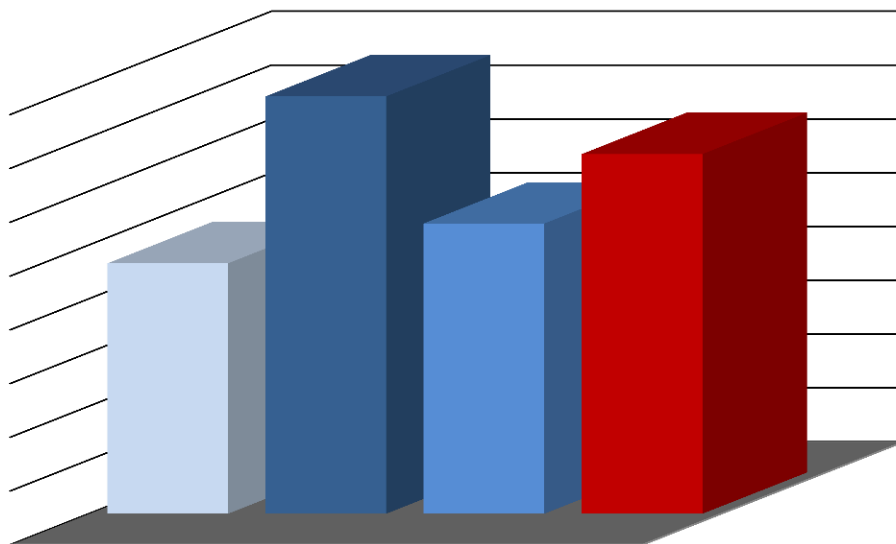
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**Figure 1: Share of Car as % age of all trips**

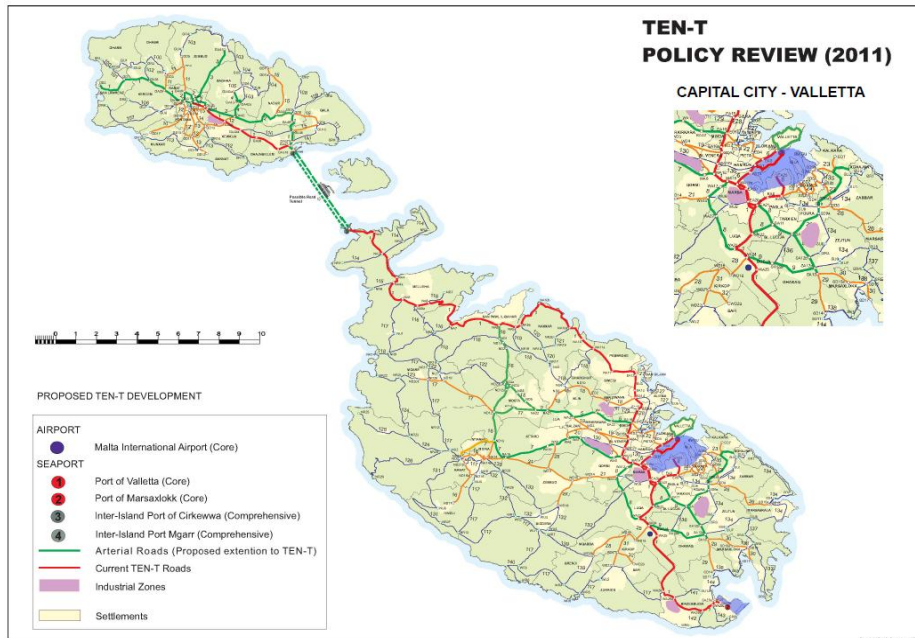
Despite having a fiscal regime that imposes comparatively high taxation levels for car registration, above EU average fuel costs levies and an annual circulation tax that is aimed to discourage the purchase of high polluting cars, the traffic and environmental impacts of the private motor car ownership and usage have been growing in proportion to the desire for increased mobility. Today, Malta has one of the highest per capita car ownership levels in the EU with the number of households possessing 3 or more cars currently standing at 19.4%.



**Figure 2: Motorisation (cars/1000 persons)**

The annual increase in the motor vehicle particularly in recent years has, in turn, been exerting great pressure on national transport infrastructure both in terms of the high demand for parking space and motorist demand for increased road capacity. Capacity problems and bottlenecks now exist at a number of critical locations on the 2,350 km of road network, particularly at major traffic intersections located on the 260km main strategic road

network. The traffic bottleneck problems are starting to spread from the traditional peak hours associated with morning and evening commuting into other hours of the day and night. Whilst many of the bottlenecks have been alleviated where feasible through recent investment into the upgrade of parts of the strategic road network, the high level of urbanisation and environmental constraints at certain critical sections prove to be an insurmountable barrier to the provision of new road links or widening of existing infrastructure.



**Figure 3: Map of Malta – Trans European Network as at 2011**

### 1.1.2 ROAD SAFETY

Notwithstanding the high rate of motorization, Malta has managed to sustain its position within the EU of having one of the lowest levels of road traffic fatalities per capita. Although the actual number of fatalities is small and susceptible to high fluctuations, the general trend in accident reduction has been positive reflecting the combined impact of various new legal provisions aimed at improving safety of drivers and their vehicles, more technology-driven enforcement, improved road engineering and increased public awareness on road safety.

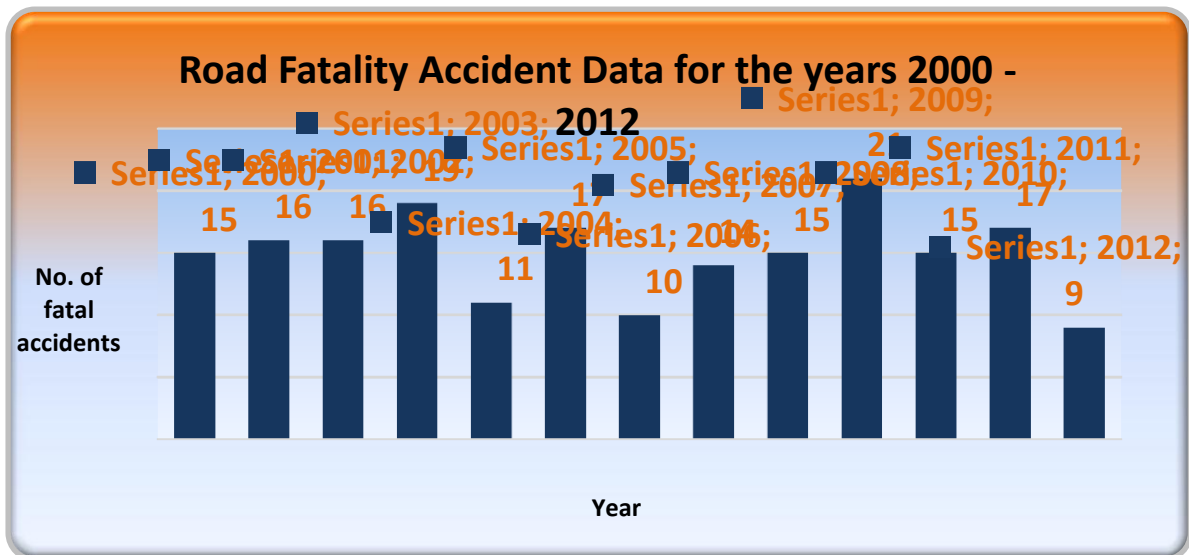


Figure 4: Total Road Fatalities that took place between 2000 and 2012

### 1.1.3 PUBLIC PASSENGER TRANSPORT

Up until July 2011, the public passenger transport systems in Malta and Gozo were operated by two associations of around 450 bus owners. Up to that point, bus patronage levels had been in general decline since the late 1970s as a corollary to increased levels of car ownership and usage and as a result of the low quality of the service, public infrastructure, and vehicles.

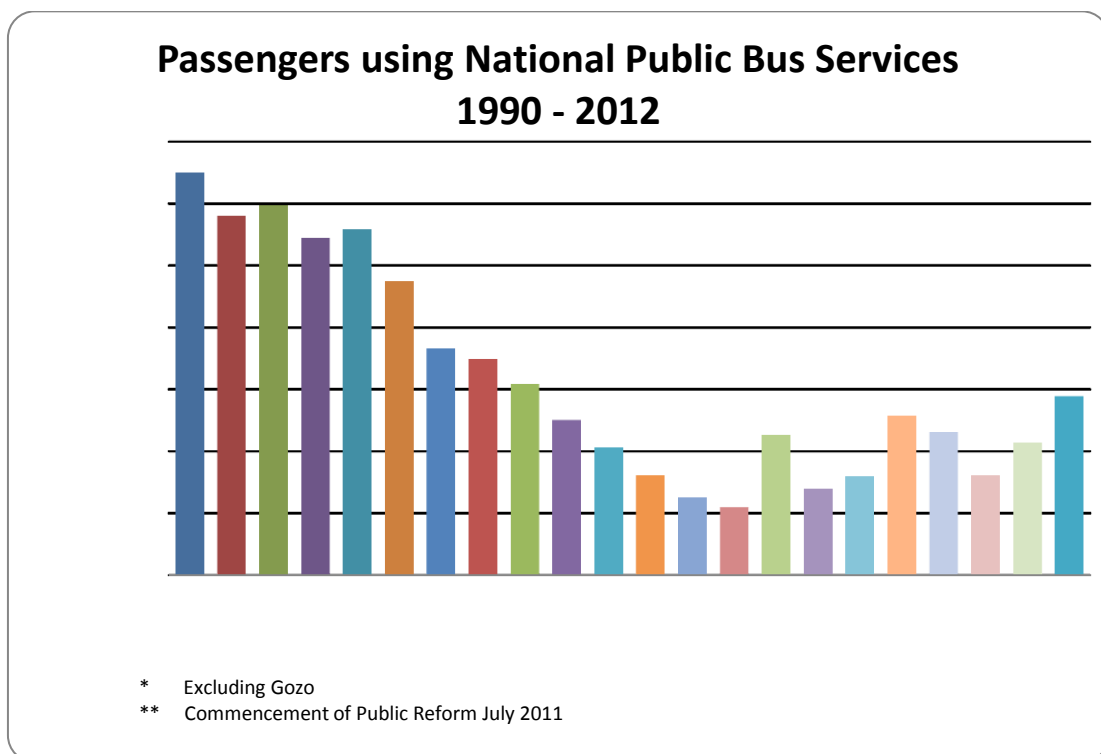


Figure 5: Malta Bus Patronage 1990 - 2011

Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road provided government with a catalyst for radical reform in the operation of urban and suburban regular bus services in Malta and Gozo.

In July 2011 a new Public Transport Service was introduced that saw the public transport operation being transferred to Arriva Malta Ltd.<sup>2</sup> under a ten year public service concession contract . The introduction of the new operator has brought with it a number of systemic changes to the public transport system in Malta; namely:

- A new bus fleet equipped with air conditioning, low floor access to wheelchair and mobility impaired persons, improved passenger comfort and safety;
- Environmentally friendly buses with Euro V engines;
- Better informed bus users with the help of additional information on board buses, bus stops and websites. 1,897<sup>3</sup> new bus stops were installed in Malta and Gozo with timetables for each route on each bus stop;
- All buses equipped with locating devices, enabling real time remote monitoring facilities for both the operator and Transport Malta;
- Improved driver training, attire and behaviour.

1.1.3.1 The radical, overnight change of the public transport system; its operator, route network, drivers, infrastructure, information, ticketing etc was not without planning, technical and operational problems. The past 12 months, will serve as an important learning experience for the planning and execution of any future transport changes at a national level. Now that the new public transport bus services are in place and the first year of operation indicates a growth in patronage levels full operation, the main challenge facing both government and the operator will be how to improve of reliability of bus services in traffic and how to encourage further modal shift away from the private car.

#### **1.1.4 NATIONAL POLICY ON SAFE AND SUSTAINABLE MOBILITY**

1.1.4.1 In 2005, the traditional 'predict and provide' policy approach to tackling traffic problems made way for a new transport policy framework that placed more emphasis on safe and sustainable mobility for goods and persons through better management of traffic using existing infrastructure.

1.1.4.2 The objective behind this policy was to encourage a modal shift away from the private car to non-car modes (public transport, walking, cycling and internal ferry travel) and to introduce a more technological approach to enforcement of offences relating to road safety. The policy was planned and implemented as a demonstration project in the capital city of Valletta and

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<sup>2</sup> Arriva Malta Ltd is a subsidiary company of Deutsche Bahn

<sup>3</sup> TM Annual Report 2011

implemented in different phases over a five year period. These phases included: pedestrianization of central shopping streets, provision of off-street parking in a peripheral part of the peninsula, operating small buses, providing park and ride connections to the city, the implementation of vehicle access charging system (CVA), provision of electric minicabs for services within the city, re-introduction of a high-capacity lift providing access to central Valletta from harbour level to city level in the fortifications ditch, introduction of inner harbour ferry and water taxi services and improved public transport facilities.

The 2010 National Household Transport Survey clearly demonstrated the success, in policy terms, of the sustainable mobility strategy adopted for Valletta. Against all national trends, the modal share of bus travel to Valletta compared with 1998 increased by more than 9% and the modal share of cars trips to / from Valletta had decreased by over 9%. Valletta, which is an important retail, shopping and business centre, had experienced a net increase in the total number of trips when compared with 1998. This highlights the policy aim that it is possible to increase mobility in a sustainable manner.

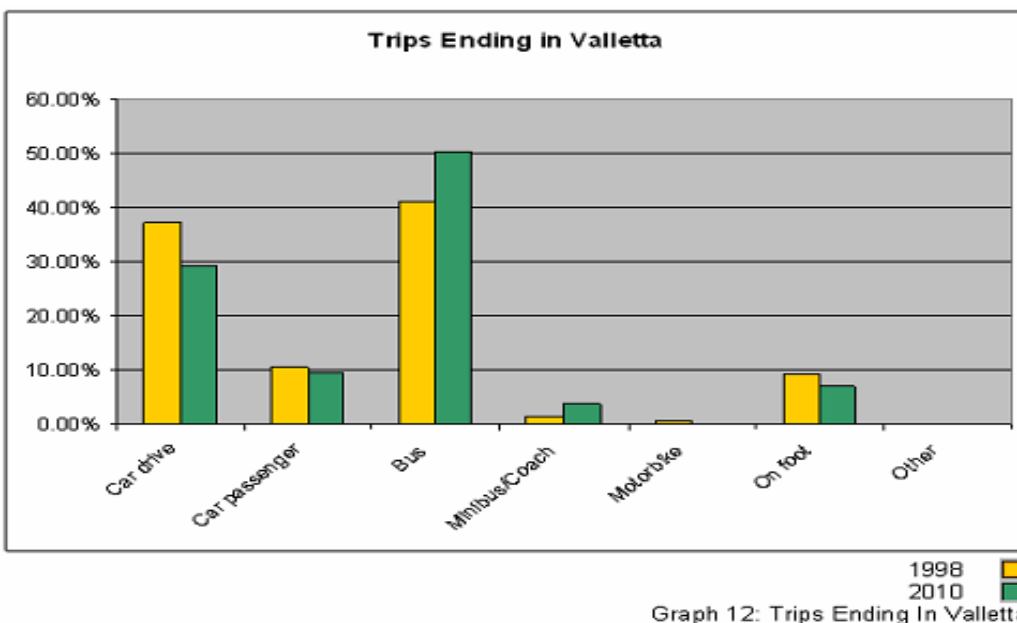


Figure 6: Modal Split for Trips ending in Valletta in 1998 and 2010

1.1.4.3 **The above shows** an overall increase of 0.3% in passengers in 2011 when compared to 2010. The number of passengers for 2011 declined in the first five months of the year, before the new transport service was introduced. However, between August and December 2011, passenger numbers increased from 13.4m to 14.6m passengers<sup>4</sup> with an increase of 8.9% from 2010.

## 1.2 TRANSPORT MALTA

Transport Malta, the national authority responsible for the planning and regulation of air, sea and land transport has been entrusted with the coordination of ITS deployment for the next operational programming period up to 2020. The first phase of the ITS Action Plan

<sup>4</sup> TM Annual Report 2011 with figures provided by the operator (Arriva Ltd) for operations as from 3 July 2011

covers the period from 2013 to 2017 while the second phase will be carried out over the period 2018-2020.

- 1.2.1 Transport Malta (TM) was established by Government through Act XV of 2009 and is the national regulator for all modes of transport, including land transport, maritime transport and Civil Aviation.

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 entreep-  
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
- standardise practices in the transport sector in Malta, in line with international norms and with those of the EU in particular

As the competent authority for air, sea and land transport, Transport Malta has developed the ITS Action Plan in a manner that will facilitate ease of information integration between the different travel modes for seamless inter-modal journey planning.

### **1.3 ITS ACTION PLAN**

This national report is a follow up of the first National Report submitted by Malta to the European Commission in August 2011 and in accordance with requirements and obligations as laid down in Directive 2010/40/EU on the framework for the deployment of Intelligent Transport Systems in the field of road transport interfaces with other modes of transport.

This ITS Action Plan, is not just a product of Directive 2010/40, but also stems from a national conviction and transport policy commitment to better manage traffic congestion and its

externalities to reduce greenhouse gas emissions and improve road safety, security and the quality of life in the Maltese Islands.

The Action Plan aims to provide a sound foundation for the medium-term deployment of ITS in the road transport sector. It is a road map that builds on existing ITS deployment in order to develop a comprehensive and integrated national ITS tailored to meet the local societal, environmental and travel needs. The Malta ITS Action Plan broadly follows the *EasyWay Guidelines*<sup>5</sup> for Deployment built around the four major questions, that is, the 'What', the 'Where', the 'How' and the 'When'.



It must be pointed out, however, that there are elements in the ITS Framework Directive that are less relevant to the travel and traffic conditions in a small island state than they would be to other larger EU member states. In this respect, a fifth question came into play; 'why'? The priority areas and measures contained in the Action Plan were derived from a careful selection and extensive consultation in order to ensure that their value-added contribution to national policies on safe and sustainable mobility.

The ITS Action Plans is structured as follows: Section 2 of the Plan examines the current state of play of ITS deployment in the Maltese Islands', Section 3 outlines the existing national technical and legal framework that regulates the different aspects of ITS deployment. Section 4 details national ITS priority areas and actions and Section 5 provides an overview of the ongoing deployment of ITS and as a conclusion to the ITS Action Plan, Section 6 discusses future possible plans and proposals for the further development of the Urban Traffic Management and Control system beyond 2017.









## **2.0 CURRENT STATUS OF ITS IN MALTA**

Innovation in traffic management will help to 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. A number of self-contained projects have been planned, piloted and rolled out over the past 7 years in traffic management and enforcement. This deployment has been greatly aided by the existence of a robust and accurate national database of licensed motor vehicles 'VERA' that is updated with data concerning new vehicle registrations, scrapped vehicles and transfers of ownership on a daily basis. Over this time, transport users and regulators have been exposed to a number of different facets of ITS-enabled traffic management and control using computers, electronics, satellites and sensors in-vehicle and at the roadside and transport planners and policy makers are now starting to build up vast amounts of raw traffic and travel data which may be appropriately filtered and structured for transport system research and development.

### **2.1 CONTROLLED VEHICULAR ACCESS (CVA)**

The 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 a best practice. 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 CVA system was launched in May 2007 and makes use of Automatic Number Plate Recognition (ANPR) technology and an unobtrusive dedicated camera system to monitor and photograph vehicles entering and exiting all access points to the capital city. 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.

#### **2.1.1 ITS DEPLOYMENT IN THE CVA**

The Valletta CVA uses Automatic Number Plate Recognition 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. On an annual basis the system captures between 12 and 14 million vehicles entering and exiting the zone.

This interpreted data is supplied to the imaging database on the imaging server which automatically identify 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.

The CVA Billing System automatically calculates the amounts to every registered owner of a vehicle that accesses the Charging Zones, based on the time in and time out of the respective zone. These charges are based on all the data retrieved from the imaging database. The rates and rules used for the access fee calculation are inputted by the Contracting Authority and can be updated easily depending on requirements.

The system automatically registers a number of exemptions which are already fed into the system including; residency exemptions, ad-hoc exemptions (one off / for a short period), special needs/disability exemptions, medical and administrative exemptions, public transport exemptions (related to public transport vehicles) and time-based exemptions (based on specific time ranges).

## **2.2 PUBLIC TRANSPORT**

July 2011 represented an important turning point for public passenger transport in Malta with the introduction of a new scheduled public bus transport system for the provision of related services and fulfilment of the respective public service obligations. The operation of new service was awarded to Arriva Malta Ltd, a subsidiary of Deutsche Bahn following an EU-wide competitive tendering process. Together with the development of road infrastructure, this new 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 use of public transport and other sustainable modes of internal transport on the other

The new public transport system has seen the introduction of a new fleet of ITS-enabled buses for Malta and Gozo equipped with latest Euro V engine technology and on-board systems. The new bus fleet, as a standalone measure, has significantly reduced emissions from public transport over the past 12 months. This is combined with a matrix network of termini and interchanges designed to facilitate nationwide accessibility. The buses are also designed for easier access to users with impaired mobility.

The core operating system of the national public transport system includes a number of ITS related components that are listed below.

### **2.2.1 ITS DEPLOYMENT IN PUBLIC TRANSPORT**

The new public bus transport operator is providing a modern public information system for scheduled public transport users. This ITS deployment contrasts with the previous scheduled bus service operator which had no ability to provide real-time information to users.

#### *ITS-Enabled Public Transport Buses*

Set with an on-board visual and audible information system to advise users 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 Transport Malta's Public Transport Control Centre for control and enforcement purposes.

#### *Automated Passenger Counting System*

To keep track of passenger movements on the public transport network and improve the monitoring of passenger flows, all of the public transport bus fleet is equipped with an Automated Passenger Counting System. The system is comprised of a sensor on each door which provides real time detection of the number of passengers boarding and alighting from the bus, providing the operator with information on the capacity status of the service enabling it to fine tune and improve the service by deploying extra services where required so as to improve the overall efficiency of the service.

#### *Automatic Vehicle Monitoring System*

The Automatic Vehicle Monitoring System (AVL) is used to monitor all timetabled bus services and is designed to ensure maximum operating efficiency. The AVL also allows the

operator to follow its buses and to effectively plan services with respect to unforeseen events such as emergency road closures, traffic accidents or even breakdown of buses. This also provides input for the RTPI (see below) for passengers at the bus termini and interchanges.

#### Real Time Passenger Information – RTPI

The central control room system allows operational staff to provide an interactive input into any of the RTPI passenger displays as and when required. Other important messages concerning route and other network updates can also be delivered to these in-bus electronic signs.

#### Park & Ride

The status of the Park & Ride (P&R) sites are monitored throughout their opening hours, and motorists are advised of actual availability of car parking spaces through variable message signs on the approaches to the sites.

## **2.3 FULL ELECTRIC VEHICLES (FEVs)**

Another important development was the awarding of EU funds for a demonstration project under the LIFE+ action, titled Demo-EV, where TM and the Ministry of Resources and Rural Affairs (responsible for Climate Change mitigation) are demonstrating the use of the latest Full Electric Vehicles and the use of the respective EV charging infrastructure around Malta and Gozo, so as to encourage public take-up of this technology.

### **2.3.1 ITS DEPLOYMENT IN THE DEMO-EV PROJECT**

This project is also being used to demonstrate how ITS can be applied in the area of charging facilities for electric powered motor vehicles. As part of this project, 100 public smart charging and smart parking points are to be deployed across Malta and Gozo. The charging point network will also be linked with the proposed Traffic Control Centre that will host the Intelligent Traffic Management System. Through its Traffic Control Centre, TM will be able to monitor the performance of the vehicles as well as their charging status.

TM will also demonstrate and test the effectiveness of Full Electric Goods Carrying Vehicles. The data gathered from Electric Vehicles in this project will contribute to the improvement of the data available in the UTMC and will provide additional data for policy decision making.

## **2.4 ITS ENABLED PUBLIC TAXI AND MONITORING SYSTEM (PTM)**

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.

As part of its efforts to improve transport car passenger safety, Transport Malta has also introduced new legal provisions which require taxi service operations to be ITS enabled.

### **2.4.1 ITS DEPLOYMENT IN THE PTM SYSTEM**

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

- 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;

- 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;
- 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.
- 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
- emergency buttons accessible to each of the passengers and the driver that triggers the CCTV camera and transmits a distress signal to the control centre.

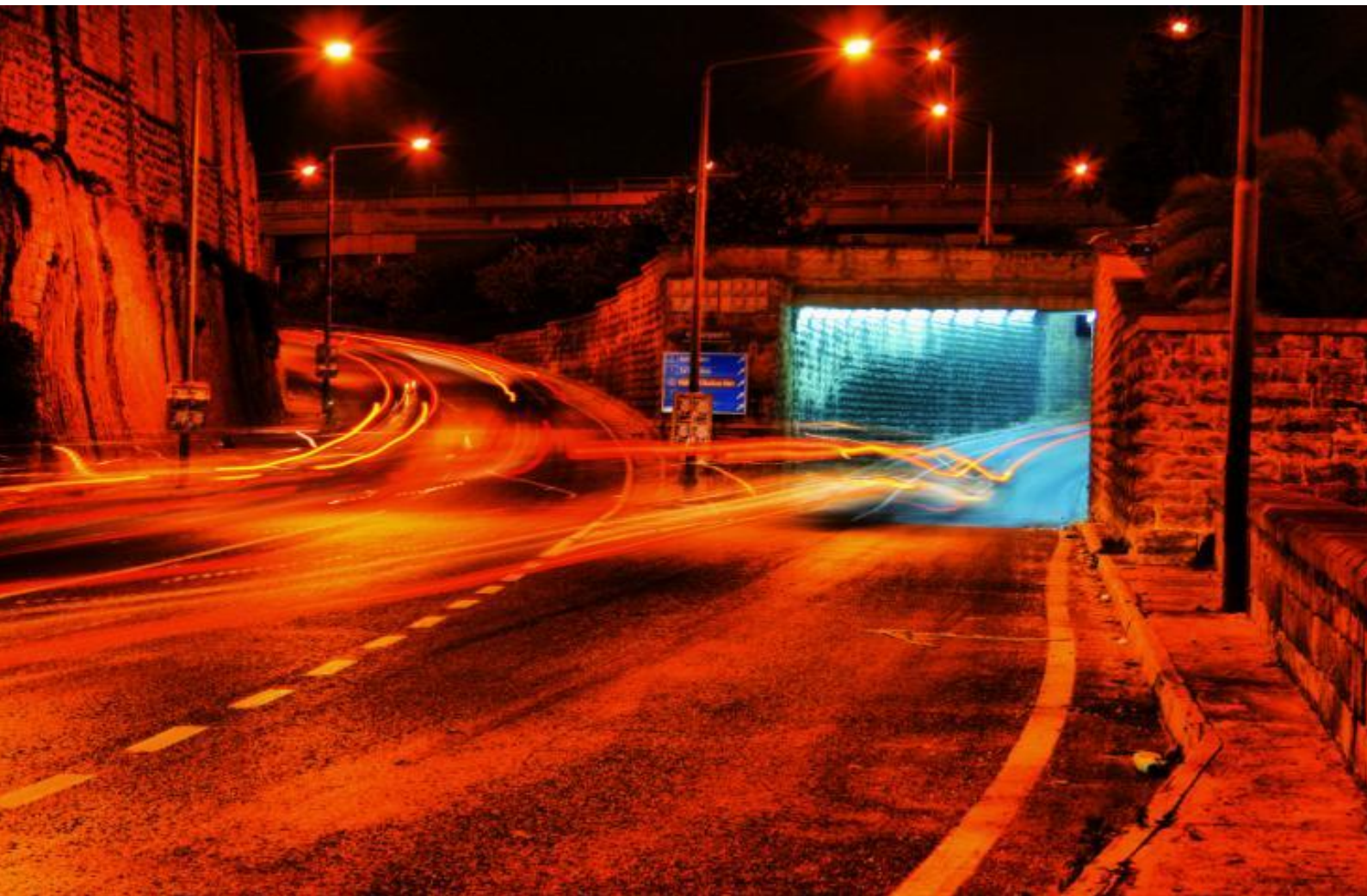
The regulator also obtains real-time information on speed and direction of the vehicles to monitor compliance of taxi operations with traffic regulations and to provide further informative data on road traffic conditions. As of August 2012, a new examination and certification system for taxi drivers was established which addressed both driving and social skills.

## **2.5 SPEED CAMERA NETWORK**

Since 2005 more than 13 speed cameras have been permanently fixed on stretches of road that have both a poor record for road safety and where the 85<sup>th</sup> percentile traffic speeds are well above the legal speed limit for the section of road. On the whole, over the past 7 years, 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. Plans are underway to introduce wide deployment of mobile speed cameras and to pilot average speed cameras.

### **2.5.1 ITS DEPLOYMENT - A SPEED CAMERA NETWORK**

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 a real-time using wireless technology. Automatic Number Plate Recognition software is used to match the vehicle registration plate with the registration number contained in the VERA national vehicle registration database. The postal address of motor vehicle owner is extracted and the fine is automatically communicated to the postal address of the registered vehicle owner.



### 3.0 LEGAL AND TECHNICAL FRAMEWORK

Before 2012, the regulation of ITS operation was largely provided for under *ad hoc* legal, technical and contractual provisions relating to the application of the specific ITS measures that have been deployed as summarised in section 2.

#### 3.1 LEGAL ITS FRAMEWORK

3.1.1 In 2012, the legal framework for the development and deployment of ITS services was established under the Authority for Transport in Malta Act as Subsidiary Legislation S.L. 499.61 “Deployment and Use of Intelligent Transport Systems Regulations”.

3.1.2 Where these regulations do not yet prescribe standards and specifications, reference is made to the relevant sections of the Design Manual for Road and Bridges, a technical guidance manual for road infrastructure designers which has a legal basis through Subsidiary Legislation S.L. 499.57 “New Roads and Road Works Regulations”.

Over the coming months, it is planned that the subsidiary legislation 65.05 “Traffic Signs and Carriageway Markings Regulations” that govern the type and sizes of road shall be revised in order to provide the legal basis for messages and pictograms intended to be displayed on the planned dynamic digital traffic signage.

3.1.3 S.L. 499.61 on the Deployment and Use of Intelligent Transport Systems Regulation will be further amended in 2013 to reflect the latest developments of ITS in Malta. A regulatory framework, including standards to be adopted, shall be developed for all ITS related on-road infrastructure including, those relating to CCTV cameras and other on-road peripherals.

#### 3.2 TECHNICAL FRAMEWORK

3.2.1 A small number of ITS-related businesses exist in Malta that are involved in the development and production of both hardware components and software for ITS applications.

3.2.2 Like most of the EU Member States, Malta strongly supports the value of harmonisation of international standards and facilitation of the effective operation of an open market. Malta will do this in a number of ways, including:

- Identify established *de facto* standards for national deployment, through consultation with public-private bodies;
- Establishing further national specifications; where particular to Malta
- Participating in European and/ or international standards related *forums*.

Transport Malta will identify and publish key standards and specifications to be used in Malta for:

- Urban Traffic Management Control (UTMC) systems, which are used principally on the national and local road network;
- DATEX II (European), used principally on the Strategic Roads Network (SRN) for traffic management systems;



- Specifications and standards for public transport operations and passenger information, enabling data to be shared and exchanged and also for systems to be able to request and respond to enquiries related to travel information and journey planning architecture;
- traffic advisory systems;
- general ICT industry standards (fixed and mobile internet, fixed and mobile telecommunications)
- Local standards for strategic road network systems, especially covering safety issues.



# 4.0 NATIONAL PRIORITY AREAS AND ACTIONS

## 4.1 METHODOLOGY OF PRIORITISATION IN A NATIONAL CONTEXT

Malta’s ITS Action Plan is structured on five key pillars in the form of basic questions , which have been applied throughout the prioritisation of the European Priority Areas and Actions when planning for ITS deployment within the national context. The questions that were followed in this regard were; **‘what’** is envisaged to be deployed, **‘where’** and **‘how’** the deployment is going to take place and **‘when’**, in as far as time lines are concerned. The question **‘Why’** has been added as a fifth pillar, as it is important to arrive to a justification why a particular priority action or measure was either selected or not to be part of this ITS Action Plan. The structure adopted for determining national priority areas and actions is largely based on the guidelines drawn up under the EasyWay programme for ITS core Services. The sequence of the questions applied for each measure and action was as follows:



Figure 7: Sequence of Pillar Questions

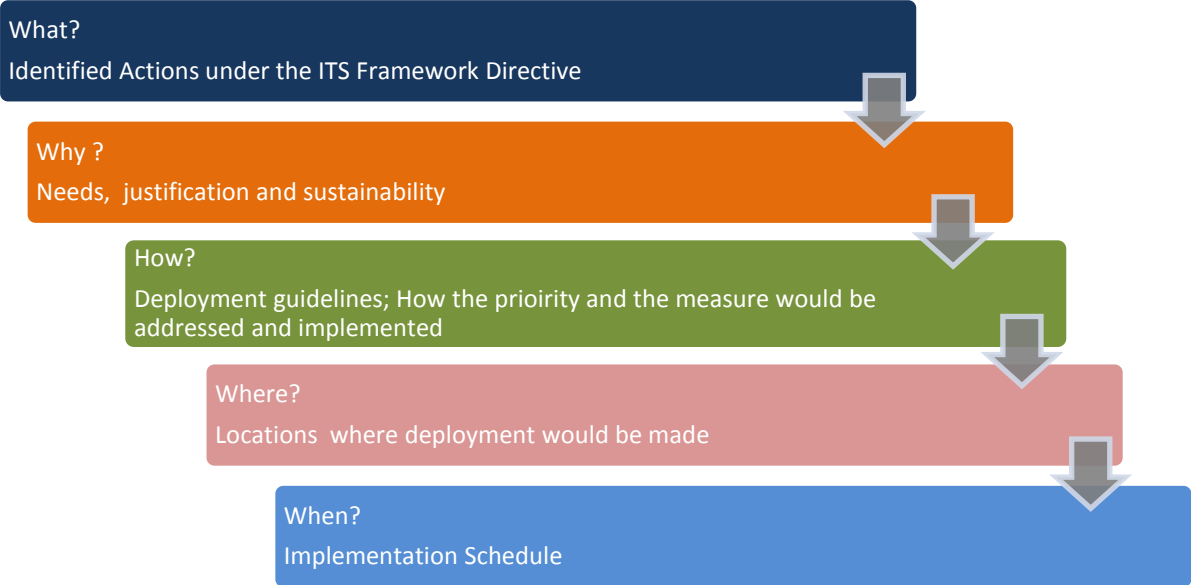


Figure 8: Sequence of Pillar Questions Explained

#### 4.1.1. Justification and Prioritisation

The selection process of the actions and measures listed under the ITS Action Plan 2013-2017 was made following careful relative assessment according to the level of importance and priorities that Malta **must** have/do and similarly those that it **must not** do or have, keeping in mind Malta's main transport aims and policy objectives. These aims and objectives are being further expanded to form Malta's National Transport Strategy 2014-2020 which is currently being drawn up.

In a similar manner to the overarching *EasyWay* objectives, Malta's National ITS Action Plan has also specific objectives emanating from Malta's current national transport policy objectives and in line with the targets and indicators attributed to Malta's Phase 1 of its ITS deployment under the MODUS Project. Hence, the measures and actions were rated and ranked in accordance to the importance they have within Malta's current transport policy framework and the contributions they are expected to give to achieve in respect of the aims and targets of the current policy. The specific medium term objectives and targets of the MODUS Project under the current programme are:

- i. Achieving a modal shift of 8% to non-car modes
- ii. An overall improvement in journey time by approximately 15%
- iii. A non-quantified contribution to Malta's Climate Change and Energy targets
- iv. Improving of air quality levels in specific traffic bottlenecks

On the other hand, the high level transport policy objectives, where planned ITS deployment will also play an important role in facilitation are:

- i. The provision of clean and efficient transport systems and public transport services;
- ii. Achieving a significant modal shift from the use of the private passenger car on to public transport services and other clean modes of transport,
- iii. Addressing traffic bottlenecks and improving traffic management,
- iv. Improving air quality,
- v. Improving road safety
- vi. Reducing road fatalities

#### 4.1.2 Level Rating

The level rating structure although taken from the *EasyWay* Guidelines has been adapted in places, as explained below.

##### **Level One**

##### **Must (Required/ Shall)**

Level One is the highest rating given to a particular action which is essentially and absolutely required to achieve a particular objective. In this respect the action **must** and should be put in place to achieve that objective. An example of this is the traffic control centre and the UTMC system architecture, without which the entire deployment will not function.

##### **Must Not (Shall Not)**

Of equal importance, a highest negative rating was given to measures and actions which are not required to be implemented in Malta. Such actions if deployed in the national context, would not effectively achieve national transport policy objectives due to the specificities of the Maltese Islands' and, in this respect, investment would have a very low rate of return.

Examples of such actions are the provision of safe and secure overnight parking systems for lorries to facilitate drivers to take their mandatory rest periods. Provision of such facility would be of low added value in view of the small island exemption from the application of rules on driving times and rest periods for vehicles operating exclusively on national territory and the negligible volume of non-national, driver-accompanied vehicles circulating in Malta.



## Level Two

### **Should** (Recommended)

Level two is applied to a particular action which is recommended to achieve a particular objective. In Malta's ITS Action Plan, the term **should** is, however, not given precisely the same meaning as that applied in the *EasyWay* Guidelines. The ITS Action Plan, applies a more literal definition to the term **should**, and is **recommended** to be implemented in order to fully achieve the desired objective. An example to illustrate this would be the installation of data recording equipment near signalised traffic junctions to enable the traffic light controllers to adapt to changing levels of congestion.

**Should Not:** Not Recommended

Similarly the **should not/ not recommended** is given the opposite meaning to **should / recommended** above.

## Level Three

**May:** Optional/ Nice-to-have

A Level three ranking is given to measures and actions that are not deemed essentially to achieve the objective. An example of this is in the case of the deployment of the CCTV core-network that will be deployed in Malta. It would have been 'nice-to-have' all the CCTV cameras with Automatic Incident Detection (AID) capabilities in order to achieve incident management across the whole of the road network, but the incorporation of this extended

facility is not being envisaged within the timeframes and budgets earmarked for the current ITS Action Plan.

#### 4.1.3 Funding

The financing for Malta’s current and planned national ITS deployment is coming from a mix of national funds, ERDF funds and private investment. This includes on-going ITS development commitments to be undertaken by the private sector through concession contracts with Government (mainly public passenger transport, Controlled Vehicle Access, Speed Camera network) and the use of national funds with EU co-financing through an ERDF funded project entitled MODUS as detailed in section 5. Public sector investment in ITS over the Action Plan period is indicated in the graph below.

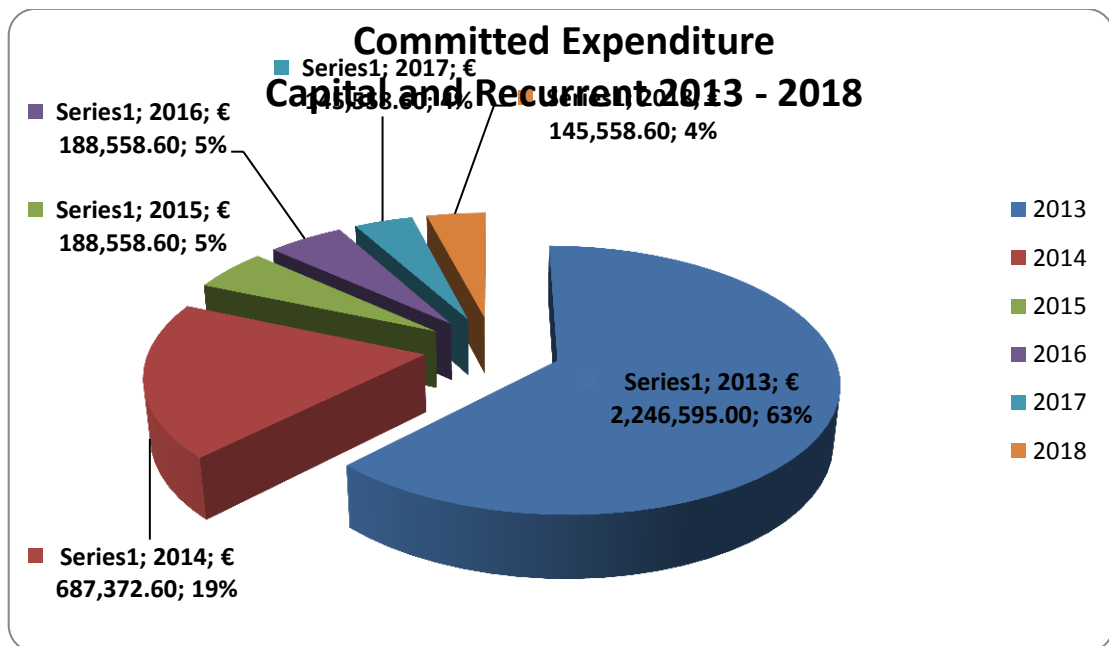


Figure 9: Committed Expenditure 2013 - 2018

For the years 2016 to 2018, the level of further capital investment is estimated based on current plans to extend ITS measures being deployed. These plans and their related levels of investment are to be read as being indicative.

## 4.2 EUROPEAN PRIORITY AREA 1: OPTIMAL USE OF ROAD, TRAFFIC AND TRAVEL DATA

ITS applications rely on an accurate knowledge of both the characteristics of the road network and the traffic regulations applicable (e.g. one way streets and speed limits). While in the past the bulk of this knowledge was provided by authorities, there is a trend towards the increased utilization of commercially-available sources of such information.

Where road safety is at stake it is essential that this information is validated and made available to all players on a fair and equitable basis, in view of the need to ensure a safe and orderly management of traffic. This applies, in particular, to digital mapping, including its inherent processes for data collection, validation and timely updating.

Similar considerations apply to the provision of (real-time) traffic and travel information services. Specific issues include the notion of “universal traffic messages”, i.e. the type of messages to be provided free of charge to all road users as a public information service, the consistency of the information between the various sources, and the need to comply with prescriptions imposed by network management operations.

4.2.1 Malta recognizes the importance of the accessibility to traffic and travel information data to enable businesses and road users as well as public transport commuters to plan ahead their activities or access such information in real time to assist them in taking informed decisions when it comes to commence on any transport related activity.

The provision of such data therefore supports more effective logistics, infrastructure planning and better operations of our roads and public transport networks. The economic cost of inefficient travel and transport is high and can be mitigated by open access to travel, traffic and road disruption data.

4.2.2 During the first phase of its planned ITS deployment, Malta will also be investing substantially in real-time traffic data capture and traffic data management to provide more integrated services, the provision of real time information to road users as well as off-line data for policy makers and research purposes with the aim to provide a more efficient and safer transport operations of the national road network.

The National travel information infrastructure initially will include Public Transport related information (as part of the development of a multi-modal journey planner) where such a facility would probably be very popular with car journey planners as well as transport operators engaged in the transport of goods. Further details of this investment, and the benefits it will provide, will be reported in the next National Report, by which time the system is expected to be operational.

4.2.3 **What?**

The following are actions proposed in the ITS Framework Directive under Action Area 1. The actions listed below are those envisaged to be implemented in Malta as part of its planned ITS National priorities between 2013- 2017.

|            |     |    |                |
|------------|-----|----|----------------|
| Action 1.2 | YES | NO | MAYBE/ PARTIAL |
|------------|-----|----|----------------|

|   |                                     |
|---|-------------------------------------|
| <p>Definition of procedures for the provision of <b>EU-wide real time traffic and travel information services</b>, addressing notably the following aspects:</p> <ul style="list-style-type: none"> <li>• provision of traffic information services by the private sector</li> <li>• provision of traffic regulation data by the transport authorities</li> <li>• guaranteed access by public authorities to safety-related information collected by private companies</li> <li>• guaranteed access by private companies to relevant public data</li> </ul> | <p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p> |
|---|-------------------------------------|

| Action 1.3  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Optimization of the collection and provision of <b>road data</b> and traffic circulation plans, traffic regulations and recommended routes (in particular for heavy goods vehicles) | ✓   |    |                |

| Action 1.4   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Definition of specifications for data and procedures for the free provision of <b>minimum universal traffic information services</b> (including definition of the repository of messages to be provided) | ✓   |    |                |

| Action 1.5  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Promotion of the development of national <b>multimodal door-to-door journey planners</b> , taking due account of public transport alternatives, and their interconnection across Europe | ✓   |    |                |

#### 4.2.4 Why? – A Connected Island

Malta being a small island, connecting its whole road network and transport services through ITS is a possibility provided that funding is available. Malta's long term vision is to provide better urban and inter-urban connectivity.

With respect to Action 1.2 and 1.4, it is a priority for Malta that the procedures for the provision of national real-time traffic and travel information services including data are defined and put in place on a national level and in line with the rest of the EU Member States in a universal manner.

The same applies to Action 1.3. The collection and provision of road data should be optimized and standardised so that it can be shared with all Member States in one format. This especially applies for road- freight transport since a particular journey may take place through a number of Member States.

The promotion of the development of a national multimodal door-to-door journey planner which takes into account other public transport modes is important to promote a modal shift from the use of the private passenger car on to various forms of public transport. Multimodal journey planners make it easier for commuters to shift through different modes to complete a journey.

#### **4.2.5 Provision of real time information to those who need it**

In October 2012, the private sector operator of public passenger transport services in Malta and Gozo had introduced a new real-time information service called 'SMS Your Next Bus'. This service enables bus travellers to obtain the estimated time of arrival of a bus at any particular bus stop at any time of day.

The provision of traffic regulation by Transport Malta will be introduced in 2013 through the Urban Traffic Management and Control Centre and will provide a number of outputs, forming part of the initial service referred to as Travel Information Service (TIS). The data provided will:

- include the provision of accurate real-time based traffic information to the public and different road users in various forms through open and accessible formats;
- help to minimise traffic congestion and bottlenecks caused by traffic incidents or other road related activities such as road works and other scheduled and unscheduled events happening on the road network;
- be filtered, processed and managed;
- facilitate improved road transport operations such as through automated incident detection, acquired through the deployment of Automatic Incident Detection (AID) CCTV equipment in specific areas of the road network and on-road sensors as well as from other sources of information (such as that collected manually by Transport Malta officers and Police officers) as well as road flooding;
- contribute to a single strategic overview of the network enabling the transport authority to identify traffic events, patterns and common occurrences and develop and monitoring strategies to better manage traffic flows and manage road users based on extensive traffic data;
- inform other stakeholders such as the Police and Emergency Services, the media and the general public of traffic related measures and actions.

#### **4.2.6 How?**

Travel Information Services (TIS) will be part of Malta's solution to make public transport more accessible and efficient. It will combine all forms of public transport services, including the domestic ferry services that operates between Malta and Gozo and the harbour ferry service operating between the villages, towns and cities within the harbour areas.

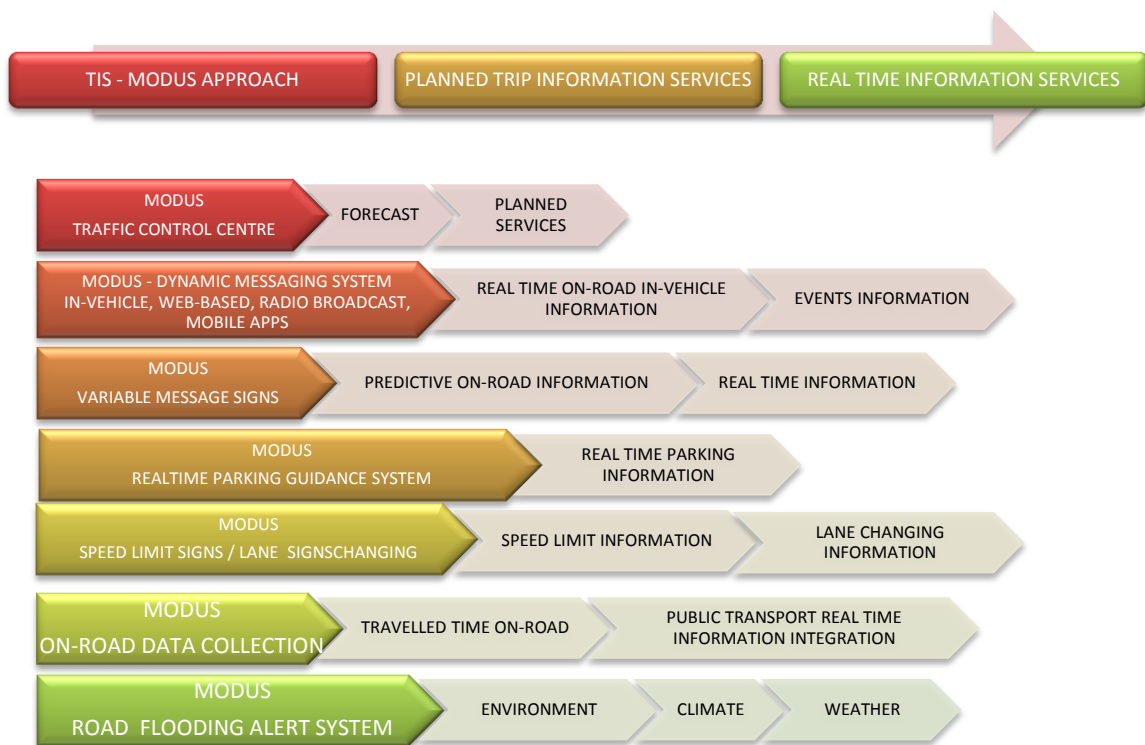


Transport Malta will promote a multimodal journey planner, discussions with transport operators will commence during the second half of 2013.

The service will enable users to compare different journey times as well as costs, including that of personal transport. The TIS will be developed by bringing together existing journey planners and data and their through standard data protocols. It is expected that Malta will seek to finance this through a mix of National and possibly EU funds such as those available under the Structural funds as well as with the participation of private initiatives and investments.

Through better TIS, it is expected that further modal shift between the various modes of transport will result since users can take informed decisions on the move without requesting prior knowledge of options and their respective scheduling. Leveraging through high mobile telephony penetration Malta will capitalise on this by providing transport users real-time information on the move.

Additionally, this service will be provided to all web-based applications including through the deployment of smart kiosks in various transport hubs and other tourist zones and areas as well as city and village centres, intended for those transport users who do not have a smart phone service, so as to make transport information available and accessible to all transport users.



**Figure 10: Planned ITS Information Services**

TIS will be provided under the MODUS project through the deployment of a complex core Dynamic Messaging System (DMS) made up of a number of electronic variable message signs, lane changing signs, variable speed messaging signs. These will be deployed in specific road sections along the strategic road network, as well as inter-modal hubs. Through the Dynamic Messaging System, road users will be given travel information services as sent out by the Traffic Control Centre. The information will be given through the DMS as well as

through real time travel bulletins as well as to mobile subscribers through mobile applications of various formats.

During the procurement of the Travel Information System (software and hardware, including all the types of electronic message signs), it was ensured that the respective specifications requested were in line with current European standards that are in place. Similarly to the universally applied Road Signs and Signals, the new and emerging electronic message signs also need to be universally standardised. Transport Malta will in the near future be updating Malta's traffic regulations on conventional road signs and signals to include the electronic road signs and signals.

It is envisaged that the multi-modal journey planner will be also available through a web-based application both at tourist information kiosks to be deployed in specific urban cores and tourist locations as well as through mobile telephone applications on all available formats.

#### **4.2.7 Data Formats**

Data will be provided through established DATEX II protocol that will facilitate transport authorities and private sector stakeholders to access the data in a universal manner, not only in between national stakeholders but also with EU Member States, and hence the need for common protocols. DATEX II allows the data feeds transferred between the information sources and ICT systems without any intervention from the Traffic Control Centre or the end receivers of the information.

#### **4.2.8 Data Collection and Dissemination**

Data collection will derive from a number of peripheral sensors located in road and other transport infrastructures; these peripheral sensors will include CCTV cameras with ANPR and AID capabilities. Dissemination of information to road users will initially be made through various types of Dynamic Message Signs (DMS) such as Variable Messages Signs (VMS) as well as radio broadcasts and web /smartphone based applications.

#### **4.2.9 When?**

The deployment timelines are shown in the graph below. Deployment will start towards the end of 2013 and start maturing over 2014 and 2015, with an expected Initial Capital Investment of €1.5 to €3.0 million.

#### **4.2.10 Where?**

All actions within Action Area 1 will be implemented on the selected road sections, nationwide as indicated in the MODUS project and applied across all modes of land transport and road users. These actions will also be applied at multi-modal hubs, including ferry services.

### **4.3 ACTION AREA 2: CONTINUITY OF TRAFFIC AND FREIGHT MANAGEMENT ITS SERVICES ON EUROPEAN TRANSPORT CORRIDORS AND IN CONURBATIONS**

#### **4.3.1 What?**

The following are the actions proposed in the ITS Framework Directive under Action Area 2. The actions listed below are envisaged to be implemented in Malta as part of its National Priorities between 2013 and 2017.

| Action 2.1   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| <p>Definition of a set of common procedures and specifications to ensure the <b>continuity of ITS services</b> for passenger and freight in transport corridors and in urban/interurban regions. This work should include benchmarking and standardisation on door-to-door information flows, interfaces, traffic management and travel planning, and, in particular, event and emergency planning</p> |     |    | ✓              |

| Action 2.2  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| <p>Identification of ITS services to be deployed in support of freight transport (<b>eFreight</b>) and development of appropriate measures to progress from concept to realisation. Particular attention will be given to applications for goods tracking and tracing using state-of-the-art technologies such as RFID and EGNOS/Galileo-based location devices</p> |     |    | ✓              |

| Action 2.3 | YES | NO | MAYBE/ PARTIAL |
|------------|-----|----|----------------|
|------------|-----|----|----------------|

|  |   |
|--|---|
| Support for the wider deployment of an updated multimodal <b>European ITS Framework architecture</b> for intelligent transport systems and definition of an <b>ITS framework architecture</b> for <b>urban transport mobility</b> , including an integrated approach for travel planning, transport demand, traffic management, emergency management, road pricing, and the use of parking and public transport facilities | ✓ |
|--|---|

| Action 2.4   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Implementation of the interoperability of electronic road toll systems |     | X  |                |

#### 4.3.2 Why?

Malta will partially implement Action 2.1 in working at a national and contributing at an EU level towards development of a set of common procedures and specifications. This work will include benchmarking and standardisation on door-to-door information flows, interfaces, traffic management and travel planning, and, in particular, event and emergency planning. These defined and clear procedures are considered to be of absolute importance especially in the case of emergency services

Transport Malta may develop policy guidance for the facilitation multi-modal ticketing between private operators of public transport services.

With respect to Action 2.2, as far as Identification of ITS services to be deployed in support of freight transport (eFreight) and development of appropriate measures to progress from concept to realisation, Malta will wait for further developments in this regards. Transport Malta will consult on this action with its stakeholders, in particular freight forward companies who operate on the European mainland.

As far as Action 2.3 is concerned, Malta will support the wider deployment of an updated multimodal European ITS Framework architecture for intelligent transport systems and definition of an ITS framework architecture for urban transport mobility, including:

- i. an integrated approach for travel planning,
- ii. transport demand,
- iii. traffic management,
- iv. emergency management,

Malta will not however implement any road pricing infrastructure (at least in the foreseen future) or safe and secure parking for freight forwarders. However it will support the latter at

a European level. Malta's position on road charging is taken on a case-by-case basis and upon consultation with its stakeholders.

With respect to Action 2.4, Malta does not plan to implementing any national electronic road toll systems during the ITS Action Plan period. Malta will, however, continue to strongly support the development of interoperable of toll systems at an EU level, since this would reduce delays and administrative burdens for road haulage companies.

#### 4.3.3 **Where?**

Actions 2.1 and 2.4 in this Priority Area will be implemented and deployed, as appropriate, on a selected number of road sections and designated areas nationwide.

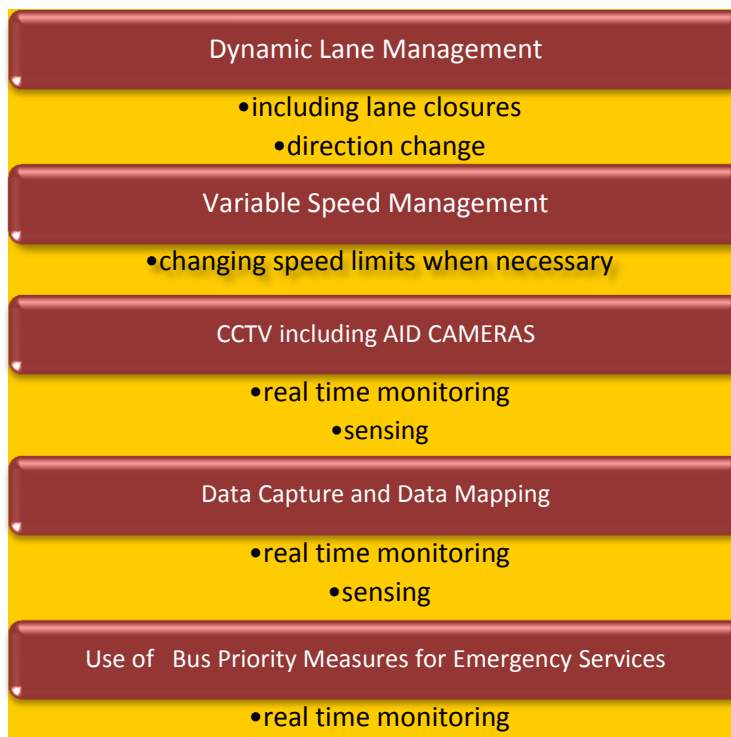
#### 4.3.4 **How?**

Over the next five years, Malta will continue to support the deployment of a national open multimodal ITS system architecture for intelligent transport systems (Action 2.3), an Urban Transport Management and Control System (UTMC) as well as an integrated approach for travel planning, transport demand, traffic management for emergency services, public transport management and the use of parking and public transport infrastructure.

Incident Management Core National Service

This will give Transport Malta Incident Management capabilities on Malta's National Road Network including Malta's TEN-T Road Network. This will give the respective authorities to:

- i. Real time visibility
- ii. map the level of incident detection, notification,
- iii. the time to detect an incident
- iv. Improved reaction time for emergency and rescue services
- v. Road clearance



**Figure 11: ITS Components for Incident Measures**

With respect to the promotion of eFreight services in Action 2.2, Malta shall be extending its online PortNET system into a transport and customs Single Window to alleviate barriers and bottlenecks at Malta’s external sea borders. Transport Malta will continue to encourage private sector road haulage operators to invest in ITS and vehicle tracking devices, particular in the operation of carriage of dangerous goods by road.

4.3.5 With respect to Action 2.3, Transport Malta will be deploying on-road sensors for automatic traffic counting as part of the first phase of its planned ITS deployment. Through these counters, it is intended that Malta will be in a position to ascertain counts of vehicles employed freight transport to determine the strategic network priority for freight transport by road. This will serve to guide planners and policy makers in respect of any future deployment of ITS on the road network aimed at reducing delay and improving safety for road haulage operations.

4.3.6 Action 2.3 also refers to emergency management. In this regard one has to note that the ITS deployment envisaged under this Action Plan will also cater for improved management for emergencies. In this regard, the system has been adapted to take into consideration safety issues relating to flash floods at certain times of years on roads in low lying areas.

**4.3.7 When?**

The above measures will be deployed towards the last quarter of 2013, throughout 2014 and 2015. After this deployment, Transport Malta will be in a position to monitor the efficiency of the system before taking any decisions on further measures to be put in place during the second phase.

**4.4 ACTION AREA 3: ROAD SAFETY AND SECURITY**

4.4.1 The Government of Malta and Transport Malta are supportive of ITS technologies through which both road safety and security are increased.

ITS-based road safety and security applications have proved their effectiveness, but the overall benefit for society depends on the scale of their deployment. Issues that require additional attention include designing a safe Human Machine Interface (HMI) (using the work done on the “European Statement of Principles”), integrating nomadic devices and ensuring the safety of vulnerable road users (such as the elderly).

Efforts to promote best practices in these areas are therefore crucial to address these issues. Transport systems may also be under security threats. Transport security, especially the need to protect travellers and transport workers and to secure transport facilities and assets, must be taken into account without jeopardising efficient and effective transport operations.

**4.4.2 What?**

The following are the actions proposed in the ITS Framework Directive under Action Area 3. The ticked actions in the tables below are the identified measures considered as a National Priority that will be implemented in Malta.

| Action 3.1  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Promotion of deployment of advanced driver assistance systems and safety and security related ITS systems, including their installation in new vehicles (via type approval) and, if relevant, their retrofitting in used ones | ✓   |    |                |

| Action 3.2  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Support the Implementation Platform for the harmonized introduction of pan-European eCall, including awareness campaigns, upgrading Public Service Access Points' infrastructures and an assessment of the need for regulation. | ✓   |    |                |

| Action 3.3   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Development of a regulatory framework on a safe on-board <b>Human-Machine-Interface</b> and the integration of nomadic devices, building on the European Statement of Principle on safe and efficient in-vehicle information and communication systems |     |    | X              |

| Action 3.4  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Development of appropriate measures including best practice guidelines concerning the impact of ITS applications and services on the safety and comfort of <b>vulnerable road users</b> | ✓   |    |                |

| Action 3.5   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Development of appropriate measures including best practice guidelines on <b>secure parking places</b> for trucks and commercial vehicles and on telematic parking and reservation systems |     |    | X              |

#### 4.4.3 Why?

As a signatory to the MoU on eCall, under Action 3.2 Malta will be promoting the service, encouraging that vehicles are equipped with the appropriate devices and to set up a state of the art PSP facility to handle eCall emergency calls. With the latter falling under the responsibility of the Police and the Ministry of Home Affairs, due to the high level of motorisation in Malta and a rather short road network, emergency services would further benefit if they are quickly alerted to road accidents through a speedier response.

Action 3.4 – road safety of vulnerable users is a priority action under the current transport policy framework. Further ITS work is planned in the area of speed management and enforcement particularly in relation to effective enforcement to protect vulnerable road users such a motor cyclists, cyclists and pedestrians.

4.4.4 Action 3.5 – the provision of safe and secure parking areas for trucks and commercial vehicles is not a priority action under the current ITS Action Plan. The reason for this is that the actual demand for the provision of safe and secure public parking areas for the parking of trucks and commercial vehicles during daytime and overnight is negligible. This largely emanates from Malta’s small geographical size and peripheral location which leads to little



or no demand for international driver-accompanied vehicles used in road haulage or commercial transport and from the fact that national operators use their own operating centre facilities for parking of vehicles given the short distance of trips.

#### 4.4.5 **How?**

eCall (Action 3.2) will be rolled out in the coming years, once the vehicles will be equipped with this technology. In order to be fully functional the 112 PSAP would need to be e-call enabled.

Action 3.4 – In this respect Malta has already an extensive network of Speed Cameras deployed at specific road sections where there is excessive speeding or which have poor road accident records relating to speed. In addition to this, during 2012, Transport Malta has adopted a new National Speed Management Policy which envisages additional ITS deployment in enforcement through the introduction of average speed cameras.

#### 4.4.6 **When?**

4.4.7 Action 3.2 - Once the digital PSP facility in Malta is set up and vehicles equipped with the respective eCall technology are rolled out, this action will be reviewed in 2015 to determine any further action required. Initiatives under Action 3.4 are expected to be introduced in 2013.

### 4.5 **ACTION AREA 4: INTEGRATION OF THE VEHICLE INTO THE TRANSPORT INFRASTRUCTURE**

The use of ITS components or systems is stipulated in several existing or planned legal acts and voluntary agreements applicable to commercial or private vehicles. Examples include the provisions on the transport of dangerous goods and live animals, digital tachograph, electronic toll collection and eCall. Most of these legal instruments and agreements have evolved independently of each other, so there is little synergy between the instruments.

Further streamlining and integration within a coherent, open-system architecture could yield better efficiency and usability, reduced costs and enhanced extensibility, enabling a “plug and play” integration of future new or upgraded applications such as those in nomadic devices and those utilising GNSS services for advanced positioning and timing. This open system architecture would be embodied in an open in-vehicle platform, guaranteeing interoperability/interconnection with infrastructure systems and facilities. With this modular approach, additional functionalities could be integrated later for in-vehicle safety, safe Human Machine Interfacing, personal mobility, logistics support and access to multimodal information and possibly electronic vehicle identification.

It is envisaged that this platform could be introduced in commercial vehicles first as there is much to gain from improving freight and passenger transport. Positive feedback from these applications would help speed up the uptake of integrated ITS applications in private vehicles, therefore stimulating a Europe-wide market for original and after-market in-vehicle products and services. The development of cooperative systems, based on an exchange of information and communication between vehicles and with the road infrastructure, is also progressing rapidly, and needs to be further promoted.

#### 4.5.1 What?

The following are the actions proposed in the ITS Framework Directive under Action Area 4. The listed actions below are expected to be implemented in Malta as part of its National priorities.

| Action 4.1   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Adoption of open <b>in-vehicle platform architecture</b> for the provision of ITS services and applications, including standard interfaces. The outcome of this activity would then be submitted to the relevant standardization bodies. |     |    | X              |

| Action 4.2  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Development and evaluation of <b>cooperative systems</b> in view of the definition of a harmonized approach; assessment of deployment strategies, including investments in intelligent infrastructure |     |    | X              |

| Action 4.3   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Definition of specifications for infrastructure-to-infrastructure (I2I), vehicle-to- infrastructure (V2I) and vehicle-to-vehicle (V2V) communication in co-operative systems |     |    | X              |

| Action 4.4   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Definition of a <b>mandate for the European Standardization Organizations</b> to develop harmonized standards for ITS implementation, in particular regarding cooperative systems. |     |    | X              |

#### 4.5.2 Why?

Malta will not be carrying out any direct initiatives under this Action Area for the primary reason that it does not have a vehicle manufacturing base. Government however is committed to ensuring that any ITS related system architecture to be deployed nationally would be open, modular and interoperable.

## 4.6 ACTION AREA 5: DATA SECURITY AND PROTECTION, AND LIABILITY ISSUES

The handling of data (notably personal and financial data) in ITS applications raises a number of issues, as citizens' data protection rights are at stake. At the same time, data integrity, confidentiality and availability must be ensured for all parties involved, especially citizens.

Finally, the use of ITS applications creates additional requirements in terms of liability. These issues can be a major barrier to wide market penetration of some ITS services if citizens' rights are not shown to be fully protected.

### 4.6.1 What?

The following actions proposed in the ITS Framework Directive under Action Area 5 listed below are expected to be implemented in Malta as part of its national priorities.

| Action 5.1  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Assess the <b>security</b> and personal <b>data protection</b> aspects related to the handling of data in ITS applications and services and propose measures in full compliance with Community legislation. | ✓   |    |                |

| Action 5.2  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Address the <b>liability</b> issues pertaining to the use of ITS applications and notably in vehicle safety systems | ✓   |    |                |

### 4.6.2 Why?

Currently the only related legislation in place relates to generic data protection and data security. No ITS specific legislation has been yet developed in Malta in this respect, but this will be addressed as from 2013 onwards.

### 4.6.3 How? When?

A review of national legislation on data protection and data security will continue in 2015.

## 4.7 ACTION AREA 6: EUROPEAN ITS COOPERATION AND COORDINATION

Coordinated deployment of ITS in the EU calls for intensive and effective cooperation between all parties involved at European level, ideally leading to rapprochement on deployment requirements, better synchronization of deployment activities and avoidance of national and proprietary silo solutions that constitute barriers to European integration. Dissemination of the best available knowledge as to the costs and benefits of ITS projects from a full life-cycle perspective and feedback on relevant experience are needed to support informed investment decisions by public authorities across Europe.

To make EU-wide deployment a reality, agreements on common assessment methods and uniform tools for decision support are therefore crucial. Such coordinated deployment of ITS throughout Europe also requires greater involvement of cities and regional authorities, notably at urban and at inter-urban level. Guidance and technical support should be provided to facilitate and underpin consensus building and decision-making processes.

Finally, the implementation of the measures in this Action Plan will call for an adequate governance structure. Member States should aim at reaching agreement on a common ITS agenda and on methods to proceed from plans to coordinated implementation, for example by way of concerted investments or harmonization initiatives.

### 4.7.1 What?

The following actions proposed in the ITS Framework Directive actions under Action Area 6. The actions listed below are expected to be implemented in Malta as part of its National priorities.

| Action 6.1   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Proposal for a legal framework for European <b>coordination</b> on the Europe-wide deployment of ITS | ✓   |    |                |

| Action 6.2  | YES | NO | MAYBE/ PARTIAL |
|---|-----|----|----------------|
| Development of a <b>decision-support toolkit</b> for investment decisions in ITS applications and services. This should include a quantified evaluation of the economic, social, financial and operational impact and cover aspects such as user acceptance, life-cycle cost/ benefit as well as the identification and evaluation of best practice for facilities procurement and deployment |     |    | ✓              |

| Action 6.3   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Development of <b>guidelines</b> for the public <b>funding</b> from both EU (e.g. TEN-T and Structural Funds) and national sources of ITS facilities and services based on an assessment of their economic, social and operational value |     |    | ✓              |

| Action 6.4   | YES | NO | MAYBE/ PARTIAL |
|--|-----|----|----------------|
| Set-up of a specific <b>ITS collaboration platform</b> between Member States and regional/ local governments to promote ITS initiatives in the area of <b>urban mobility</b> | ✓   |    |                |

#### 4.7.2 **Why?**

Malta has already transposed the ITS Framework Directive and will continue to update its national legislation as deployment of ITS takes place. Transport Malta believes that the national development of ITS could benefit from the development of closer technical and operational collaboration between central and local authorities and between Malta and other EU member states through knowledge transfer and exchanges of best practices.

#### 4.7.3 **How?**

Malta has an 'observer' country status in the *EasyWay* project for European-wide ITS deployment on TEN-T corridors. The Deployment Guidelines DG2012 based on best practices across Europe have been used as a basis for ITS deployment in Malta. Malta is actually considering upgrading its membership status in this programme.

## 5.0 CURRENT STATUS OF ITS DEPLOYMENT

### Phase One (2013-2017)

#### 5.1 MODUS – ENCOURAGING MODAL SHIFT IN LAND TRANSPORTATION

5.1.1 Since preparation of the national report on ITS in 2011, a number of important developments in the national deployment of ITS have taken place. Tender preparation for the MODUS Project, which is Phase One of Malta’s medium term ITS deployment strategy, is completed and the tender is expected to be published in January 2013.

Phase One will include the setting up of integrated Urban Traffic Management and Control (UTMC) that is open, interoperable and modular in its system architecture and which will include an Urban Traffic Management and Control System and a number of sub-systems using different networks of on-road ITS peripherals.

The various components of the UTMC are technically detailed below:

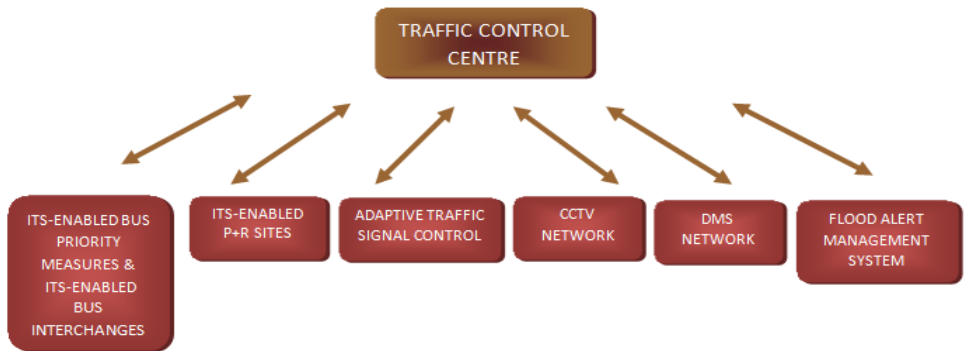


Figure 12: Traffic Control Centre and Sub-Systems

#### 5.1.2 Traffic Control Centre

The modular system architecture of the traffic control centre will integrate together all subsystems planned with existing third party systems and subsystems already in place thus allowing for further integration of subsystems and functionality for future deployments.

The UTMC will be capable of detailed planning (including simulation) and traffic management in specific areas of the road network including general ITS traffic management, information and control at selected links and traffic signal junctions and specific ITS management of public transport vehicles through critical sections along bus corridors.

#### 5.1.3 ITS-enabled Bus Interchanges

The main aim of these bus interchanges is to improve the safety and effectiveness of the key junctions on the new bus network matrix, making public transport more attractive to users,

including persons with visual and hearing impediments. The main bus termini have all recently been equipped with real-time displays of estimated time-of-arrival for bus services.

#### **5.1.4 ITS-enabled Park & Ride**

There are three main park & ride facilities in Malta being operated by the private operator of public transport services. Variable message signs have been deployed at the entry points to the park and ride facilities providing motorists with information about car park space availability. Further variable message signage is to be provided at other strategic parts of the road network in advance of the park and ride facilities.

#### **5.1.5 Adaptive Traffic Signal Control**

The coordination of all the traffic signals in the clusters illustrated in Annex 1 with a view to facilitating progression to vehicles through the network at critical sections. Within these clusters all the signals will be ITS enabled with queue and vehicle detectors to respond intelligently and continuously as traffic flow changes and fluctuates throughout the day.

A number of new bus lanes along major bus corridors are being constructed that are to be equipped with bus transponder activated pre-signal devices with a view to segregating buses from general traffic and giving selective priority to buses (and emergency vehicles), particularly late running services at traffic signal installations.

#### **5.1.6 CCTV Network**

The UTMC includes a good number of intelligent Closed Circuit Cameras (CCTV) placed in strategic locations on the road network for traffic monitoring and in other critical road sections that affect public transportation and monitoring equipment plus related software applications.

The CCTV network will be made up of different types of cameras including Automatic Incident Detection (AID) cameras in specific sights which will provide operators in the central control room with direct visual overview of the traffic situation on selected parts of the road network. The AID system will be capable of detecting incidents like vehicles stopped in normal traffic lanes, foreign stationary objects in normal traffic lanes, queuing traffic, wrong way traffic, stationary vehicles (other than buses) in bus lanes.

#### **5.1.7 Dynamic Message Sign Network**

A number of Electronic Variable Message Signs (VMSs) will be deployed in key areas to advise road users of delays or incidents on the road network ahead. This system will allow operators in the Traffic Control Centre to disseminate information, guidance and instructions relating to traffic situations at specific locations.

VMS shall be used to display variable speed limits on the strategic road network where road or traffic conditions require a downward adjustment of the speed limit of a particular section of road.

VMS shall also be used for the display of road safety messages, indication of road works and parking guidance to Park Ride Sites as outlined above.

### 5.1.8 Road Flooding Alert System

A road flooding alert and management system (RFAMS) is an integrated system aimed at alerting road users of road flooding or likely road flooding following storms. Flash floods take place several times a year in Malta following heavy rainfall and certain low-lying stretches of road network are prone to flooding. Sensors in the roadside water culvert system on roads vulnerable to flooding shall monitor run-off water levels passing through the culvert. The sensors will transmit message to alert the Traffic Control Centre and emergency services when water levels reach a certain height. Safe-route guidance to motorists shall be deployed through variable messages at the roadside and public information through the media and Transport Malta's geo-portal.

### 5.1.9 Integration of other systems

The UTMC being introduced under the ITS Action Plan is intended to be integrated with other data gathering systems regulated by Transport Malta that are operated by the private sector, namely: public transport Automatic Vehicle Location system, the Controlled Vehicle Access System and the taxi service monitoring system.

A web based Geographic Information System (GIS) is being developed by Transport Malta. The system will support planning and daily operational and business needs for managing and maintaining a state-of-the-art transportation network and services. Transport Malta's GIS is aimed to be developed as Transport Malta's central repository of road and traffic data. Through the GIS geo-portal, motorists will be advised of daily road closures to help in their choice of journey planning.

Following the implementation of the Modus project the geo-portal shall start to receive real time information on road traffic conditions (e.g. coloured digital road maps indicating current travel times) and other transport related services such as real time traffic bulletins.

The Geo-portal is the publishing element of all the spatial data that are currently being amalgamated and consolidated. The geo-portal is currently available to the public through the Transport Malta website <http://www.transport.gov.mt> and is based on an open platform using Geo-server and SQL database.





## 6.0 FUTURE IMPLEMENTATION EXTENSION AND EXPANSION OF THE UTMIC

6.1 Following the deployment of Phase 1, Transport Malta will carry out a system review which will consider additional future deployments under a new development programme, but this will generally depend on the availability and extent of national and other funding. Some of the future non-exhaustive planned measures for the 2015-2017 being developed and considered are the following:

- i. An advanced real-time travel information system for all modes of transport in the form of a journey planner for all modes . The multi-modal journey planner will include real time schedules for all modes of transport in Malta (including maritime and water ferry passenger travel, flight information schedules as well as all current and future public transport services) and will be managed through one web-based application to provide the passenger with seamless real time multi-modal travel information.
- ii. Additional traffic junctions to be integrated into the traffic junction control system.
- iii. Additional CCTV cameras and VMS will also be deployed in strategic road junctions, including those that do not form part of the current arterial and distributor roads network but are considered important to reduce urban congestion.
- iv. Further deployment of ITS infrastructure in Malta's urban cores of towns and villages to de-congest these centres from vehicular traffic and give priority on the road network to bus services.
- v. Integrated emergency vehicle services management system for emergency service vehicles is envisaged. It is the intention of TM to discuss prioritisation of emergency services vehicles with Malta's emergency services providers including the Civil Protection Department in order to make their emergency response more effective.
- vi. full nationwide parking management and parking related information system.
- vii. Integration of radio-based public broadcasting at the traffic control centre to facilitate travel bulletins and alerts.

6.2 The estimated capital investment required for Phase 2 measures outlined above between 2016 -2018 is indicated in the figure below.

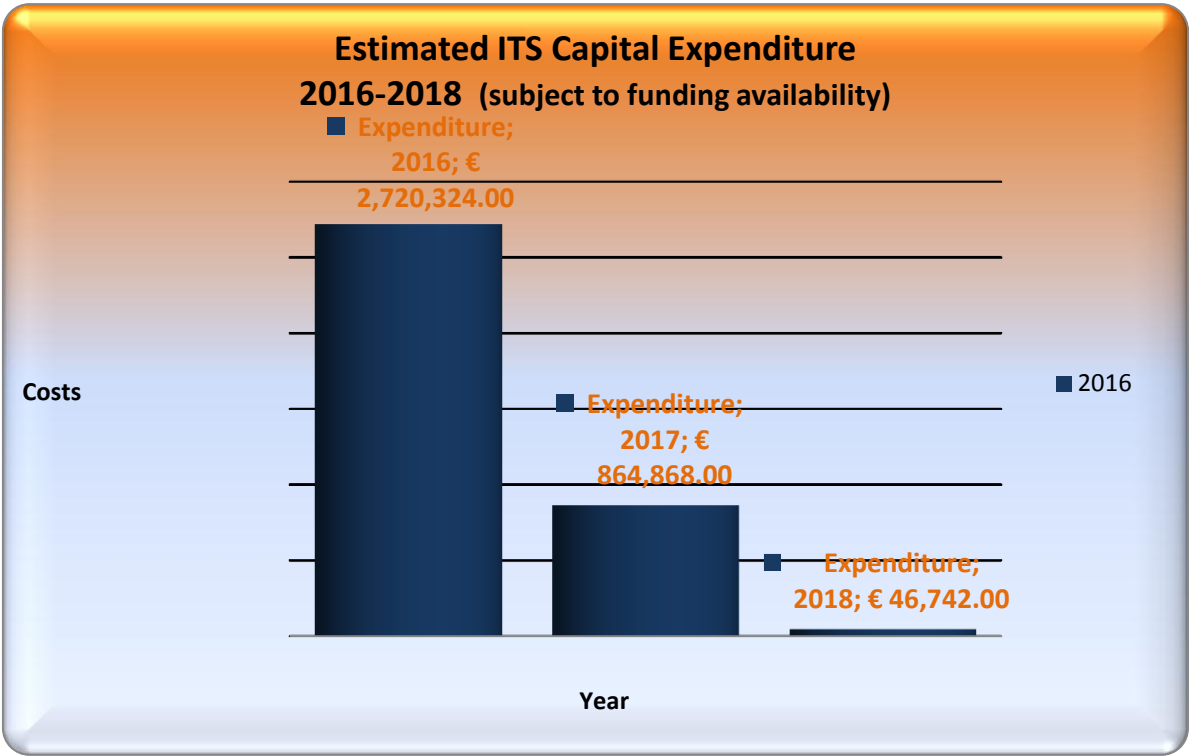


Figure 13: Estimated ITS Capital Investment 2016 - 2018

# 7.0 ANNEXES

## 7.1 ANNEX 1: MAP OF MALTA SHOWING CLUSTERS

