

# **NOISE ACTION PLAN**

**In accordance with the Environmental Noise Directive  
January 2013**

# Executive Summary

## *Legislative Background*

The Noise Action Plan has been prepared in accordance with the requirements of the Environment Noise Directive 2002/49/EC (END), which was transposed through the Assessment and Management of Environment Noise Regulations, 2004 (Legal Notice 193 of 2004 as amended). The Malta Environment and Planning Authority (MEPA) is the competent authority for the implementation of these Regulations.

The Regulations apply to noise to which humans are exposed, particularly in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. The Regulations do not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at work places or noise inside means of transport or due to military activities in military areas

## *Reporting*

The Regulations set periodical reporting obligations for a number of deliverables applying from certain dates onwards and then evolving towards five year cycles incorporating regular reviews. These deliverables are summarised as follows:

Data Flow	Summary description of information to be reported to the EC	Deadline to send data to the EC	Updates by MS
DF1	Major roads, major railways, major airports and agglomerations (to be used for first round of noise mapping in 2007 and action plans in 2008): <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 250,000 inhab.</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> <li>• major roads <math>\geq</math> 6 millions veh/y</li> <li>• major railways <math>\geq</math> 60,000 trains/y</li> </ul>	30 June 2005	Mandatory Every 5 years
DF2	Competent bodies for strategic noise maps, action plans and data collection	18 July 2005	Any time
DF3	Noise limit values in force or planned and associated information	18 July 2005	Possible At any time
DF4	Strategic noise maps pursuant to annex VI (first round) for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 250,000 inhab.</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> <li>• major roads <math>\geq</math> 6 millions veh/y</li> <li>• major railways <math>\geq</math> 60,000 trains/y</li> </ul>	30 December 2007	Mandatory Every 5 years
DF5	List of major roads, major railways, major	31 December 2008	Possible

	airports and agglomerations designated by MS (to be used for second round of noise mapping due in 2012): <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 100,000 inhab.</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> <li>• major roads <math>\geq</math> 3 millions veh/y</li> <li>• major railways <math>\geq</math> 30,000 trains/y</li> </ul>		At any time
DF6	Noise control programmes that have been carried out in the past and noise-measures in place for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 250,000 inhab.</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> <li>• major roads <math>\geq</math> 6 millions veh/y</li> <li>• major railways <math>\geq</math> 60,000 trains/y</li> </ul>	18 January 2009	No update
DF7	Action plans pursuant to annex VI (and any criteria used in drawing up action plans) for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 250,000 inhab.</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> <li>• major roads <math>\geq</math> 6 millions veh/y</li> <li>• major railways <math>\geq</math> 60,000 trains/y</li> </ul>	18 January 2009	Mandatory Every 5 years
DF8	Strategic noise maps related data pursuant to annex VI (second round) for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math> 100,000 inhab.</li> <li>• major roads <math>\geq</math> 3 millions veh/y</li> <li>• major railways <math>\geq</math> 30,000 trains/y</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> </ul>	30 December 2012	Mandatory Every 5 years
DF9	Noise control programmes enacted prior to the entry into force of the Directive for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math>100,000 &amp; &lt;250,000 inhab.</li> <li>• major roads <math>\geq</math>3 million &amp; &lt; 6 millions veh/y</li> <li>• major railways <math>\geq</math> 30,000 &amp; &lt; 60,000 trains/y</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> </ul>	18 January 2014	No update
DF10	Action plans pursuant to annex (and other criteria used in drawing up action plans) for: <ul style="list-style-type: none"> <li>• agglomerations <math>\geq</math>100,000 &amp; &lt;250,000 inhab.</li> <li>• major roads <math>\geq</math>3 million &amp; &lt; 6 millions veh/y</li> <li>• major railways <math>\geq</math> 30,000 &amp; &lt; 60,000 trains/y</li> <li>• major civil airports <math>\geq</math> 50,000 movts/y</li> </ul>	18 January 2014	Mandatory Every 5 years

*Noise Maps: For the first reporting round, following an assessment carried out by MEPA with support from noise consultants (Acustica Ltd) and Transport Malta, it was identified that Malta has no agglomerations, no major railways, and no major airports.*

The only source identified within thresholds set under the Regulations, are major roads with more than 6 million vehicle passages per year, which were identified from auto-count surveys and Trans-European Network – Transport Malta (TEN-TM) feasibility study reports held by the relevant authorities.

There are 545 roads falling under this category making up about 175km. These results have been presented as maps and statistic tables showing the noise impact from major roads, estimation of number of dwellings, area and the number of people exposed to long-term road traffic noise within the 5 dB bands.

*Noise Action Plan: A noise action plan was designed to manage noise issues and effects, which satisfy the minimum requirements set out in Annex V of the Environmental Noise Directive (END). The plan provides an overview of the requirements and obligations of the Regulations, presents a summary of the results of the strategic noise maps within Malta, and illustrates actions, which MEPA intends to take in the next five years. This plan was drafted based on the recommendations provided to the Malta Environment and Planning Authority (MEPA) by noise consultants, Acustica Ltd.*

The plan outlines a long-term strategy which aims to prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good.

It also sets out short, medium and long-term objectives for monitoring and management of environmental noise in Malta. In the short-term the objective is to focus on the finalization of all reporting obligations under the first round of the Environmental Noise Directive by 2012. In the medium term, MEPA plans to undertake the strategic noise mapping for the second round of reporting in terms of this Directive. The detailed objectives for the medium term are to:

- a) Improve stakeholder engagement and improve collaboration by establishing a cross-departmental working group on strategic noise mapping;
  - Encourage the development of a national policy statement on noise; and
  - Encourage the development of guidance on the assessment of neighbourhood noise, entertainment noise and noise nuisance.
- b) Utilise improved input data delivered via GIS enabling Government agencies, the proposed Inspire portal and especially the wider environmental monitoring programme, specifically LiDAR survey results;
- c) Develop capacity within MEPA to deliver the requirements of the noise action planning process set out within the strategy;
  - Procure the noise measurement equipment and noise mapping software;

- Redeploy additional trained personnel required to undertake the specialised work set out; and
- Provide staff training to enable effective use of the technical measurement equipment and noise mapping software procured.

d) Develop planning guidance to help protect the future noise environment:

- Guidance on assessment of noise on proposed residential developments; and
- Guidance on assessment and control of noise impacts from proposed developments on existing residential areas.

e) Work closely with the Planning Directorate within MEPA to ensure that specialist staff within the noise team, assesses all planning applications having a potential noise issue, whether being a noise producer or a noise recipient,

In the longer term, possibly looking over a 10-year period, the objectives shall be the following:

- a) Develop a unified spatial data infrastructure for sharing relevant datasets between stakeholders;
- b) Improve quality of underlying datasets;
- c) Improve quality of mapping results through training, better input data and verification through source emission measurements and medium term immission measurements;
- d) Develop planning guidance to help protect the future noise environment:
  - Guidance on assessment of noise on proposed residential developments; and
  - Guidance on control of envisaged noise impacts from proposed developments on existing residential areas
- e) Assess the potential for introducing environmental noise limits to control impact on noise sensitive locations;
- f) Assess the potential for expanding the noise management zones to cover the whole of the Maltese islands to provide consistent protection for all inhabitants;
- g) Increase institutional capacity to become increasingly self sufficient for noise action planning and strategic noise mapping:
  - Develop expertise in strategic noise mapping through engagement of personnel and training;
  - Develop expertise in noise action planning and noise mitigation through engagement of personnel and training;
- h) Report results of strategic noise mapping to the EC on a 5-year cycle in line with deadlines.

The noise action plan is set to take a staged approach in assessing the existing levels of environmental noise due to major roads in Malta. This is achieved by assessing the strategic noise maps with a view of identifying potential locations for actions using the prioritisation exercise. The proposed onset levels, for assessment of noise mitigation measures due to exposure to road traffic noise are (a)  $L_{den} = 65$  dB and (b)  $L_{night} = 55$  dB

The next step entails the confirmation of the noise levels assessed by the strategic noise maps experienced by the properties and population within the areas being

addressed. This step will lead to a review of possible mitigation actions that are then subject to a cost benefit analysis.

The identification and noise preservation of the quiet areas in the vicinity of a major road is considered to be below the proposed onset level at (a)  $L_{den}$ ; 55 dB and (b)  $L_{night}$ : 45 dB. The preservation of relatively quiet areas in open countryside will be also considered.

#### *Malta's second reporting round*

For the second reporting round, it was identified that Malta does not have an agglomeration with more than 250,000 inhabitants, no major airports having more than 50,000 movements per year and no railways. Malta's agglomeration is made up of 243 746 inhabitants and covers an area of 65.8km<sup>2</sup>. Therefore this agglomeration will be used for the second and subsequent rounds. Whilst information available from the airport indicates that in 2006 there were a total of 24,711 aircraft movements.<sup>1</sup>

The noise action plan for the second round is to be completed by 18<sup>th</sup> July 2013 and a summary of this plan is to be submitted to the European Commission by 18<sup>th</sup> January 2014.

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<sup>1</sup> *Annual Statistical Summary*, Malta International Airport plc, 2009. Available from: <http://www.maltairport.com/page.asp?n=statistics> [Accessed May 2011]

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# 1. Introduction

## 1.1 *Purpose and scope of the Environmental Noise Directive (END)*

The Environmental Noise Directive (END), 2002/49/EC, applies to 'environmental noise to which humans are exposed in particular in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas'. In this Directive, environmental noise refers to 'unwanted or harmful outdoor sound created by human activities, including noise emitted by means of transport, road traffic, rail traffic, air traffic and from sites of industrial activity'.

The Directive establishes a common approach to monitoring and managing environmental noise, including the use of common methods of assessment and common noise indicators. The aim of the Directive is to establish a common approach across Europe intended to avoid, prevent or reduce on a prioritized basis the harmful effects, including annoyance, due to exposure to environmental noise. The aim of the Directive is implemented in three stages within each Member State. The stages are the following:

- a) Determine the exposure to environmental noise, through noise mapping, by common methods of assessment;
- b) Ensure that information on environmental noise and its effects is made available to the public;
- c) Adopt action plans, based upon noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserve environmental noise quality where it is good.

The END requires the Member States within the European Union (EU) to produce strategic noise maps in 2007 for the main sources of environmental noise; (a) agglomerations with a population of more than 250, 000 persons (b) major roads, (c) major railways, and (d) major airports. It is not a requirement to assess noise generated by other activities, such as may arise from neighbourhood noise, gardening, construction work, sports and leisure activities. For the second and subsequent rounds of strategic noise mapping and action planning, the population threshold for assessment of agglomerations is reduced from 250, 000 to 100, 000 person, traffic flow thresholds for major railways are reduced from 60, 000 to 30, 000 train passages per year and traffic flow thresholds for major roads are reduced from 6 million to 3 million. The flow threshold for major airports remains at 50,000 movements per year.

Together with the population distribution information and the noise level results from the above sources, the population living within the assessment areas is estimated. The information to be delivered to the European Commission (EC) is the population exposed to noise. The END requires Member States to produce Action Plans for the first round during the 2008 and every five years.

In Malta, strategic noise mapping for the first reporting round was concluded in 2011. This exercise was carried out by MEPA with support from noise consultants (Acustica Ltd). The overall objectives of the exercise was to propose a strategy and methodology for ambient noise mapping in Malta in line with the END, to collect the baseline data and to model the noise levels through the formulation of noise maps in line with the END, to develop expert recommendations on appropriate actions and measures and to establish technical specifications for the supply of appropriate noise monitoring equipment and noise monitoring software. The reports given to MEPA from the Acustica Ltd., set out a detailed process to be followed when drawing up noise action plans and strategic noise maps under the END. The reports can be found on the MEPA website<sup>2</sup> .

## **1.2 Purpose and scope of the Regulations**

The Environmental Noise Directive is transposed separately in each Member State of the EU into local legislation. In Malta, the END is transposed by the “*Assessment and Management of Environmental Noise Regulations, 2004*”, L.N. 193 of 2004. The Regulations were issued by the Minister for Rural Affairs and the Environment under the Environment Protection Act, 2001 (CAP. 435). They were subsequently amended by Legal Notice 426 of 2007, which resulted in Subsidiary Legislation 435.59 of 2007, *Assessment and Management of Environmental Noise Regulations*. The scope of the Regulations is in line with the END, i.e. they do not cater for neighbourhood noise, noise at work and noise inside means of transport or due to military activities in military areas.

Prior to the introduction of the Regulations there was no legislative framework established in Malta to manage environmental noise. The Regulations transpose the Directive in Maltese law, and bestow certain powers and responsibilities on MEPA. The Regulations state that the designated authority for the making of strategic noise maps, the publication of information on environmental noise and the drawing up of action plans, is MEPA. This is in line with the activities of the Authority, which is responsible for environmental enforcement. The Regulations empower MEPA through the development of action plans to set up noise management zones, to designate quiet areas either inside agglomerations or in open countryside, and to establish noise reduction programs where necessary.

## **1.3 Roles and responsibilities of designated bodies**

The Regulations designate MEPA as the authority responsible to produce strategic noise maps as well as to disseminate information to the public on environmental noise and the drawing up of action plans.

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<sup>2</sup> Documents available from <http://www.mepa.org.mt/topic-noise>.

## **1.4 Key Phases**

The Directive sets out various stages of implementation and reporting, which is essentially a 5-year cycle. During these 5 years each Member State should monitor environmental noise and take necessary action to improve noise quality.

This is achieved by preparing strategic noise maps; identifying priorities by assessing the results of the noise maps and preparing a draft noise action plan. Finally each Member State must carry out a public consultation presenting the draft action plan, where stakeholders and the general public give their input such that a final action plan can be submitted. The noise maps, related data flows and a summary of the noise action plan must be submitted to the Commission. The first phase of this process is the compilation of strategic noise maps (including related data flows) and the drafting of the action plan. The following sections describe the steps undertaken to prepare Malta's noise action plan in line with the END.

### **1.4.1 Identification of areas required to be mapped**

Following an assessment carried out by MEPA with support from noise consultants (Acustica Ltd) and Transport Malta <sup>TM</sup>, it was identified that Malta does not have an agglomeration with more than 250,000 inhabitants, no major airports having more than 50,000 movements per year and no railways. Malta's agglomeration is made up of 243, 746 inhabitants and covers an area of 65.8km<sup>2</sup>. Therefore this agglomeration will be used for the second and subsequent rounds. Whilst information available from the airport indicates that in 2006 there were a total of 24,711 aircraft movements.<sup>3</sup>

For the first reporting round, the major roads were the only source to be mapped. Identification of the major roads was carried out by MEPA with the support of TM, Acustica Ltd. and guidelines given in the Directive. For the first reporting round, those roads classified as major roads are those having more than 6 million vehicle passages a year.

Section 3.1 describes how the noise mapping areas were identified and which areas were mapped within Malta.

### **1.4.2 Preparation of strategic noise maps**

The strategic noise mapping process is predominantly a technical process requiring a range of different input datasets and it entails seven stages to prepare strategic noise maps. Section 5 describes in more detail the process of the strategic noise maps.

### **1.4.3 Development of the noise action plans**

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<sup>3</sup> *Annual Statistical Summary*, Malta International Airport plc, 2009. Available from: <http://www.maltairport.com/page.asp?n=statistics> [Accessed May 2011]

The noise action plan was drafted on the recommendations given by the noise consultants, Acustica Ltd. The noise action plan includes ways on how to manage environmental noise and as outlined above it covers major roads as this was the only element satisfying the criteria for the first round of reporting. The plan was presented as a draft to the public for consultation, after which comments were taken into consideration to write a final action plan. Public consultation comments are outlined in Annex VI.

#### **1.4.4 Implementation of the plans**

The Noise Action Plan has a long-term vision that spans over a period of ten years and aims to prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and the preservation of environmental noise quality where it is of a good level. This vision encompasses short term objectives that are to be implemented by 2012, medium term objectives to be implemented within five years (2012 to 2017) and long term objectives that are to be achieved in ten years' time.

## **2. Existing noise management legislation and guidance**

### **2.1 National Legislation**

#### **2.1.1 MEPA Act**

MEPA is the national agency responsible for land use planning and environmental regulation in Malta. Established under the mandate of the Environment Protection Act (2001) and the Development Planning Act (2001) of the Laws of Malta, MEPA seeks to ensure the adequate implementation and enforcement of over 200 Directives, Decisions and Regulations under the EU Environmental Acquis. The MEPA Board is the decision-making body providing strategic guidance within the Authority. This 15-member board, headed by the Chairman, is appointed by the Prime Minister, members with experience in matters relating to environment and development, including commercial, industrial and social affairs, public officers representing the government and two MPs. In addition, there are a number of boards and committees, which provide strategic guidance for the Directorates to ensure the organisation fulfils its functions and responsibilities efficiently and effectively, in line with its legal obligations.

In 2010, the Planning Act and the Environment Act were merged and the Environment and Development Planning Act was issued. The aim of this Act is to *protect the environment, to make provision for the planning and management of development and for the establishment of an authority with powers to that effect and for matters connected therewith or ancillary thereto*. In this act a general provision regarding noise is that if a person is to engage in an activity generating noise, a license needs to be issued by the Authority.

#### **2.1.2 Integrated Pollution Prevention and Control (IPPC)**

IPPC stands for Integrated Pollution Prevention and Control. The main aim of the IPPC Regulation (L.N 234 of 2002 as amended by L.N 230 of 2004 and L.N 56 of 2008), which transposes the EU IPPC Directive (2008/1/EC) into national law, is to minimise pollution from various point sources. In fact, all installations falling under Schedule 1 of the IPPC Regulations are required to obtain a permit from MEPA to be allowed to operate and must use the Best Available Technique in their operations. These include selected sites in the waste management sector, large power generation plants, certain chemical plants and large farms.

The IPPC legislation contains basic rules for integrated permits. "Integrated" means that the permits must take into account the whole environmental performance of the plant, i.e. emissions to air, water and land, generation of waste, use of raw materials,

energy efficiency, noise, prevention of accidents, risk management, etc. This helps industrial installations identify ways by which they can minimise their contribution to pollution.

The new Industrial Emissions Directive (IED) is a result of extensive discussions among Member States, the European Commission and the European Parliament. Its purpose is to incorporate the obligations of the following seven Directives into one:

- Integrated Pollution Prevention & Control (IPPC) Directive
- Large Combustion Plants Directive
- Waste Incineration Directive
- Volatile Organic Compound (VOC) Solvents Directive
- Three Directives regarding Titanium Dioxide.

The IED is expected to be transposed into local legislation by 7 January 2013.

Certain activities that are required to be licensed may be subject to noise conditions, including where relevant, noise monitoring. When assessing the noise impact on the environment, a standard methodology is applied using the relevant standards such as ISO 1996 and BS 4142.

### **2.1.3 Planning guidance**

The Planning Directorate, within MEPA, has within its powers the possibility to set conditions on the control of noise generated by new development as part of the development planning permission. Through these permits, both noise associated with the construction phase of development as well as noise arising from the operation of the development can be regulated by these permit conditions. In general these conditions are based on the Structure Plan Policy 1990<sup>4</sup>; (a) Policy BEN 1 states that Development will not normally be permitted if the proposal is likely to have a deleterious impact on existing or planned adjacent uses because of visual intrusion, noise, vibration, atmospheric pollution, unusually high traffic generation, unusual operating times, or any other characteristic which in the opinion of the Planning Authority would constitute bad neighbourliness and (b) Policy BEN 21 states that Standards will be developed for noise emissions, and locational criteria will be identified for major noise sources. Conditions will be attached to development permits specifying maximum noise emissions and times, where appropriate. Noise abatement zones will be defined where necessary.

In the case of major development, which is subject to Environment Impact Assessment (EIA), a more thorough review of potential noise impacts is undertaken and mitigation measures for abating noise pollution are proposed accordingly. The mitigation measures proposed by the environmental assessment are normally taken on board as conditions in development permits. In addition to the above, there are no additional national policies or guidance, which address the issue of noise during the planning process.

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<sup>4</sup> <http://www.mepa.org.mt/lpg-structureplan> [Accessed May 2011]



#### **2.1.4 Environmental Management Construction Site Regulations, 2007**

The Maltese Environmental Management Construction Site Regulations, 2007 objectives are to reduce noise pollution generated from a particular activity during construction works. The Regulations defines the permissible hours of work for construction works during the year. The title of this Regulation is Environmental Management Construction Site Regulations, 2007 (Legal Notice 295 of 2007).

#### **2.1.5 Quarries and Ancillary Activities**

With specific regard to quarry operations and ancillary activities, these are generally subject to basic noise conditions through environmental permits as to mitigate noise from these activities to the nearest noise sensitive receptor.

#### **2.1.6 Limit Values**

Prior and after to the adoption of the Environment Noise Directive 2002/49/EC there are no limit values in force or under preparation.

## **3. Description of the Action Planning Area**

### **3.1 Extent of the area**

As previously highlighted Malta does not have an agglomeration, railway or a major airport that falls under the reporting round thresholds. The only source identified within thresholds and criteria are the major roads.

Major roads were identified by MEPA supported by Acustica Ltd. and Transport Malta (TM). Those roads with more than 6 million vehicle passages per year were identified from auto-count surveys and TEN-TM feasibility study reports held by the relevant authorities. Where data gaps were identified, estimates were made based on the recommendations from WG-AEN GPG v2. There are 545 roads falling under this category making up about 175km.

Since in Malta only the major roads fall within the criteria for the first reporting round, the strategic noise maps do not include agglomerations, railways or major airports. Therefore the major road network that was used for the strategic noise mapping of 2006 can be viewed in Annex III. The noise calculation was performed inside the buffer of 1km around the street centrelines. No other noise sources were taken into account.

The strategic noise mapping included areas exposed to noise from the major roads above a level of  $L_{den}$  55dB(A) or  $L_{night}$  50dB(A). Appendix III presents maps, which show the extent of the area included within the strategic noise maps.

It is important to note that the noise action plan will apply to the identified major roads. The noise action plan sets out a proposed approach to undertake a study for any necessary noise reduction measures. The plan also outlines a method by which noise mitigation measures will be assessed for feasibility. This is in line with the requirements of the Directive and Regulations.

### **3.2 Description of the major roads and geographical location**

The major roads go through rural and urban areas as well as through industrial areas. The roads are both arterial roads and distributor roads including other strategic roads performing an urban and rural linking function.

### **3.3 Description of the general population**

Most major roads are to the East of Malta and a few are to the North. Two roads in Gozo were also classified as major roads. The majority of the major roads are found

in the inner harbour region of Malta. In this area there is a high population density. The inner harbour region is also an area where there are a lot of offices and industries. A major road is also that in Marsa, where many commuters must pass through it every day since it is a very important road as it links the North of Malta to the South. Some major roads also pass in the vicinity of a central city, Mosta, which is very densely populated. Mosta has also a very busy centre with shops and other amenities, thus many people are exposed to the noise coming from the major roads in Mosta. Another road leading to Cirkewwa is considered as a major road since this is used by people traveling to and from Gozo. However in the vicinity of this road there is only a limited number of residents, since it passes through rural areas. One major road in Gozo leads to a summer destination, Marsalforn where a lot of tourists visit this village. The other major road in Gozo leads to the capital city thus is a busy road all year round.

### ***3.4 Location of noise sensitive groups***

The END states that there are certain groups that are more sensitive to noise than others, such as schools, hospitals and residential areas. In this action plan only the noise sensitive areas located in the vicinity of major roads will be considered for noise mitigation purposes.

## **4. The responsible Authority for Action Planning**

### **4.1 Name and contact details of the Responsible Authority**

The Authority responsible for action planning is MEPA. The noise action plan will include a strategy to manage environmental noise with objectives spanning a 5-year cycle.

MEPA's address is:

St Francis Ravelin,  
Floriana,  
FRN1230.

Any communication regarding the Noise Action Plan should be addressed to:

Unit D: Waste, Air, Radiation and Noise

Unit Manager

Telephone: 00356 2290 7200  
Fax: 00356 2290 2281  
Email: [noiseplan@mepa.org.mt](mailto:noiseplan@mepa.org.mt)

Due to the multi-disciplinary nature of the organisation MEPA hold responsibilities for three related areas.

The Planning Directorate is responsible for planning policy, development control and licensing of development. Within this remit is included environmental impact assessment and licensing of certain trading activities. In recent years two draft acts have been issued for consultation, Draft Building Regulation Act 2009 and Draft Environment and Development Act 2010, both of which are relevant to management of noise.

The Environment Protection Directorate is the regulator enforcing environment policy. Responsibilities cover a wide range of activities, including waste management, construction sites and IPPC permitting.

The Directorate for Corporate services is responsible for mapping and land surveying as the national mapping agency and would be the primary supplier of the data required for the strategic noise mapping.

MEPA has also issued a number of guidance documents covering issues such as quarry working, shooting ranges, micro wind turbines, planning policy, rural development, EIAs and traffic calming measures.

## **4.2 Description of other bodies of relevance**

The noise Regulations sit within a wider framework of noise and nuisance legislation, which sit on the Maltese statute. A broad outline of the agencies responsible for noise management include:<sup>5</sup>

### **Police**

A number of the chapters of the Code of Police Laws make reference to either noise or nuisance. These typically cover street and certain licensed activities. As is normal with primary legislation there is no detail as to how “nuisance” should be interpreted, or at what level and in what situation a noise becomes unacceptable, which means that application of the powers, and enforcement, may be inconsistent.

### **Ministry for Tourism, Culture and the Environment (MTCE)**

The MTCE is responsible for environmental policy, including noise.

### **Public Health Regulation Department**

The Public Health Regulation Department within the Ministry for Health, the Elderly and Community Care is responsible for public health issues in Malta. Noise is included as a risk factor in the revised National Environment Health Action Plan (NEHAP), 2006-2010 developed by this department. There is increasing evidence linking long term environmental noise to health and well being.

### **Malta Competition and Consumer Affairs Authority (MCCAA)**

The MCCAA are responsible for product safety, and included within this remit is the type approval legislation which includes noise level requirements for motor vehicles, rail systems, machinery, hearing defenders, motor cycles, agricultural machinery and fireworks.

### **Transport Malta (TM)**

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<sup>5</sup> Acustica Report 536-1-29 Noise Action Planning in Malta

Transport Malta are responsible for aspects of noise emissions from roads, airports and ports. TM is responsible for management of the road network, including vehicle licensing and roadworthiness tests, road development and road maintenance. For civil aviation TM is responsible for noise certification and regulation of certain airport operations. TM is also responsible for the ports, and crew noise exposure whilst working inside merchant and fishing vessels.

### **Occupational Health and Safety Authority (OHSA)**

The OHSA is responsible for the regulation of noise exposure in the workplace, including mineral extraction and construction sites.

### **Malta Tourism Authority (MTA)**

MTA regulate the licensing of bars, restaurants and nightclubs, under which they have powers to control noise from kitchen equipment and entertainment and leisure activities.

### **Local Councils**

Local Councils have some powers of control through licensing certain trading activities. Including within the scope of the licensing powers is the ability to avoid excessive noise impact from the activities.

### **Multi-Agency**

The Traffic Signs and Carriageway Markings Regulations, SL 65.05, enables the Police, Director of Public Works or Transport Malta to erect traffic signs. These include two with either specified or implied noise control aspects.

## ***4.3 Description of any noise-reduction measures already in force within the action planning area, or projects in preparation***

All development including the development of new roads and alterations to roads is subject to planning legislation. The planning process takes care of assessing noise impacts of roads before decisions are taken. In the case of major road developments and where a proposal falls under the requirements of the environmental impact assessment (EIA) regulations, noise assessment is undertaken as part of the EIA process.

## **5. Summary of the results of the noise mapping**

### ***5.1 Overview of the preparation of the noise map***

Strategic noise maps are produced by computer modelling techniques, which calculate the noise level at specific points resulting from the sound emanating from particular sources. The modelling software for the assessment of noise levels from major roads utilises various data, amongst which are the traffic flow, type of road, types of vehicles, percentage of traffic flow, mean traffic speed, road gradient, road surface type, location of bridges, location and height of buildings. The source data is then inputted in a 3D computer model, to estimate the noise propagation from major roads. When no data is available, the WG-AEN Good Practice Guidebook (GPG) is used.

After the completion of the noise calculations, noise level results will be available as derived datasets from the noise modelling process. The noise levels generated can now be mapped, presented graphically and be used as the basis for supplementary analysis in order to derive the required information for reporting i.e. number of people exposed to noise levels.

The process of preparing strategic noise maps is to be done in the following stages:

- Stage 1: Define areas to be mapped
- Stage 2: Define noise calculation methods
- Stage 3: Develop dataset specification
- Stage 4: Produce datasets
- Stage 5: Develop noise model datasets
- Stage 6: Noise level calculations
- Stage 7: Post processing and Analysis

Therefore the required monitoring of environmental noise is undertaken with the aid of 3D noise assessment models and noise mapping software. Noise measurement equipment may be utilized at a later stage within the action plan process to validate input data or source emission levels modelled within the strategic noise mapping process.

For all the major roads, strategic noise mapping was undertaken by MEPA on recommendations given by the noise consultants, Acustica Ltd. and in collaboration with (TM). The strategic noise mapping resulted in a regular grid for cartographic presentation and a set of building façade receptor points were later converted to a noise map. The latter is used in the assessment of dwelling and people exposure.

The calculation method used is in line with the Noise Regulations and follows the guidelines set out within Annex II of the END. Given that there is no Maltese

legislation currently setting out an official “national method” for the assessment of road traffic noise, it is recommended that the EC adapted Interim method, XPS 31-133 Interim, is used for the assessment of road traffic noise levels under the Regulations.

The European Commission recommended Interim method is described within the following documents:

- ‘NMPB-Routes-96 (SETRA-CERTU-LCPCSTB)’, referred to in ‘Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6’ and
- French standard ‘XPS 31-133’.
- For input data concerning emission, these documents refer to the ‘Guide du bruit des transports terrestres, fascicule prévision des niveaux sonores, CETUR 1980’.

Used in accordance with the adaptations set out in:

- Commission Recommendation 2003/613/EC of 6 August 2003.

The method of assessment including the recommended adaptations is referred to as XPS 31-133 Interim.

## **5.2 Presentation of results**

Two noise maps were produced for an annual average 24-hour day, using two different noise indicators,  $L_{\text{night}}$  and  $L_{\text{den}}$ .

$L_{\text{den}}$  is the equivalent continuous noise level over a whole 24-hour period. Day is defined by 07:00 to 19:00, evening from 19:00 to 23:00 and night from 23:00 to 07:00.

$L_{\text{night}}$  is the equivalent continuous noise level over the night-time period (23:00 to 07:00).

The noise levels results were then grouped into 5 dB bands as follows:

$L_{\text{den}}$  : 55 – 59, 60 – 64, 65 – 69, 70 – 74, > 75

$L_{\text{night}}$  : 50 – 54, 55 – 59, 60 – 64, 65 – 69, > 70

These noise level bands were then displayed as coloured areas overlaid with urban and industrial areas. Other information on statistical exposure results (area exposure, dwellings exposure and population exposure) were also produced. These statistical exposure results were submitted also to the European Commission as a requirement under the END.

Hence the results of the strategic noise mapping in Malta for the major road which exceeds the 6 000 000 vehicle passages a year were produced and presented in Annex III a series of coloured 5 dB bands above 55 dB  $L_{\text{den}}$  and 50 dB  $L_{\text{night}}$ .



### 5.3 Summary exposure statistics for action planning area

Set out below are summary tables estimating the population exposure and number of noise sensitive premises that lie within 5dB noise level contour band for  $L_{den}$  and  $L_{night}$  from major roads within Malta.

Noise band ( $L_{den}$ )	Number of population	Number of hospitals	Number of schools
55-59	7000	1	4
60-64	5100	2	2
65-69	3900	1	1
70-74	4500	-	1
$\geq 75$	700	-	1

**Table 1: Estimation of population exposure and number of noise sensitive premises per noise level contour bands ( $L_{den}$ )**

Noise band ( $L_{night}$ )	Number of population	Number of hospitals	Number of schools
50-54	5200	2	2
55-59	4000	1	1
60-64	4400	-	1
65-69	900	-	1
$\geq 70$	0	-	-

**Table 2: Estimation of population exposure and number of noise sensitive premises per noise level contour bands ( $L_{night}$ )**

Area (km <sup>2</sup> ) exposed to $L_{den}$ > 55	Area (km <sup>2</sup> ) exposed to $L_{den}$ > 65	Area (km <sup>2</sup> ) exposed to $L_{den}$ > 75
25	9.3	1.7

**Table 3: Exposed Area**

Dwellings exposed to $L_{den}$ > 55	Dwellings exposed to $L_{den}$ > 65	Dwellings exposed to $L_{den}$ > 75
8700	3800	300

**Table 4: Number of dwellings exposed**

## **6. Identification of areas to be subjected to noise management activities**

Strategic noise maps provide an indication of the extent of environmental noise exposure within the area of assessment. These maps do not identify where noise mitigation measures are required, nor do they show any priority action. For this reason it is important to establish an approach which seeks to identify locations where noise mitigation measures are necessary, feasible and will be cost effective.

For the purpose of identification, analysis and prioritising, a decision support matrix will be utilised. The resultant datasets from the strategic noise maps shall be used to develop a noise scoring decision matrix. This decision support matrix enables a number of different factors to be examined and facilitates the assessment of the relative importance of each. An example of this decision support matrix is presented in Annex V. This decision matrix is used to draw up a short list of potential areas for action, both above the onset values, and below the noise thresholds. Areas having noise levels below thresholds are identified such that the action plan notes the need for preserving Quiet Areas.

### **6.1 Confirmation of onset of assessment thresholds**

Performing the proposed activity entails some form of assessment noise level/s thresholds. The main aim of these onset levels is to set out a starting point in a process that seeks to identify locations that are exposed to existing levels of environmental noise.

The noise onset assessment levels used in this process do not represent any form of noise limit value nor do they necessarily indicate that above such levels the environmental noise should be considered undesirable. They are simply used to set out as a starting point in a process to identify noise sensitive locations above the proposed onset levels for which it may be considered appropriate to address the exposure through mitigation measures.

The proposed onset levels, for assessment of noise mitigation measures due to exposure to road traffic noise are:

$$L_{den} = 65 \text{ dB and}$$
$$L_{night} = 55 \text{ dB}$$

Using these onset thresholds and statistics provided in tables 1 and 2, it is estimated that the population that exceeds the assessment thresholds for  $L_{den}$  is 9100 while for  $L_{night}$  is 9300.

## **6.2 Confirmation of protection thresholds for quiet areas**

Under the Regulations it is a requirement to delimit quiet areas within an agglomeration. In Malta there is no agglomeration that qualifies under the criteria set for the first round thresholds of the Regulations.

The strategic noise maps provide an assessment of environmental noise levels across the whole of the agglomeration for roads, industrial and air traffic noise sources. They may also include recreational areas and public open spaces that should have a sense of tranquillity by having low noise levels.

Hence the identification and delimiting of quiet areas is a means of ensuring that the noise levels are preserved where they are good. It is considered appropriate to use this concept of quiet areas within the action plan.

The identification and noise preservation of these quiet areas is considered to be below the proposed onset level at:

$L_{den}$ : 55 dB, and  
 $L_{night}$ : 45 dB,

Once these values are set it is important to confirm the quiet area criteria i.e. their land use. These may be done by cross referencing the areas on the strategic noise maps below the proposed onset levels with a dataset of public open spaces to produce a list of potential quiet areas. If appropriate locations could be identified as quiet areas then the existing noise levels are to be preserved or reduced if possible. Public open spaces may be considered to include areas such as: (a) Playing fields (b) Cemeteries (c) Playgrounds (d) Public parks and gardens (e) Beaches (f) Nature reserves (g) Recreational areas (h) Places of worship (i) Educational institutions and (j) Hospitals and convalescence homes.

## **6.3 Quiet areas in open country**

Under the Regulations it is required to delimit quiet areas in the open country.

The requirement for such an area is that it is “*undisturbed by noise from traffic, industry or recreational activities*”. From the strategic noise mapping undertaken as part of the first phase of the Regulations it will not include any areas considered undisturbed by noise. This is partially due to the nature of the assessed noise sources, which do not include recreational activities, and partially due to the area of coverage of the strategic noise mapping, which for the first round is in the vicinity of major roads.

Whilst the results of the strategic noise mapping may not provide a clear indication of the location of areas which would be usefully designated as quiet areas in open country, it is recommended that during the implementation of the action plan, a review will be undertaken in this particular area. Once this is done and performed,

quiet areas in open countryside are identified in consultation with the relevant stakeholders.

In the context of the Regulations, it is recommended that any areas put forward for designation as Quiet Areas in Open Country would have low levels of environmental noise, and be predominantly free of long-term noise effects from human activity.

## **6.4 Application of the criteria/matrix**

The commencement of this process requires some form of noise level value or noise level values, which may be used as the starting point for a review process to identify locations exposed to existing noise levels. These areas may then be subject to mitigation measures. These values do not constitute any form of design guideline for noise management, nor do they necessarily indicate that at or above such levels the environmental noise should be considered undesirable. A decision support matrix will be used to assess all noise sensitive locations within the strategic noise mapping area during the implementation of the action plan.

A decision support matrix is a table that enables identification, analysis and rating of the strength of relationships between various sets of information. The decision support matrix could be used once the thresholds for onset of assessment and onset of preservation are defined. This matrix could be developed to help provide a rating scheme and to identify locations beyond the assessment thresholds. It could also be used as an initial prioritisation of areas for further investigation. The shortlist of these priorities is then mapped within a GIS system to look for any clusters that could be considered as “hot spots”.

This decision matrix is designed such that a score of approximately 17 or above indicates threshold levels that have been exceeded and thus highlights locations that should be included in the shortlist for further assessment (refer to Annex V).

## **6.5 Results of the analysis**

Currently no results are available through the decision support matrix. The results will be presented in the annual review report and will show the analysis carried out during the first year of the action plan as per the implementation plan.

## 7. Mitigation and protection measures

The Noise Action Plan aims to avoid, prevent or reduce where is necessary on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise.

Three stages are set out:

- a) Undertake strategic noise mapping to determine exposure to environmental noise
- b) Ensuring information on environmental noise and its effects is made available to the public; and
- c) Adopting action plans, based upon the noise-mapping results, with a view to preventing and reducing environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserving environmental noise quality where it is good.

The approach to manage environmental noise is by noise reduction at source, operating restrictions to reduce noise emissions and any procedures to reduce noise impacts.

### ***7.1 Description of how areas above onset of assessment criteria will be processed***

As explained above, the commencement of this process requires some form of noise level value/s, which will be used as the starting point for a review process to identify locations exposed to existing levels. This will eventually lead to a prioritised shortlist exercise based upon the strategic noise mapping exercise. The main objective of this step is to confirm that the noise levels assessed by the strategic noise mapping are experienced by the properties/population within the areas being addressed. This also applies to a review of potential noise mitigation measures and any subsequent commitment of budget to undertake any possible actions. This staged approach will ensure that any work undertaken is cost effective, will deliver genuine benefit to the residents and has been undertaken in a prioritised manner.

There are two ways to confirm the noise levels indicated by the strategic noise maps: (a) field survey work and (b) undertaking a review of the strategic noise models. In further detail, the two processes are carried out as follows:

- a) Field survey work would ascertain whether the properties being assessed have noise sensitive rooms on the most exposed facades, or whether noise mitigation measures were already in place, which may not be indicated within the calculation model. The field survey will also help with the calibration of the strategic noise map.
- b) The review of the strategic noise models will help to reduce the uncertainty in the calculated noise levels within the area under review.

Once the extent of the existing noise impact has been confirmed for the locations under review, the potential noise mitigation measures will then be investigated, and a cost benefit analysis undertaken for each, with the aim of developing a selection matrix which leads towards a recommendation for action.

## ***7.2 Description of how areas below protection threshold will be preserved***

Those areas identified below the protection threshold, are subject to a review such that they are confirmed as quiet areas.

## ***7.3 Description of how areas between thresholds will be managed***

For those areas, which fall between the thresholds, it is important that the existing noise climate is preserved where appropriate. To perform this, careful consideration is needed especially for new developments being planned in relation to long-term environmental noise pollution.

To ensure that the noise climate is preserved it is important to manage environmental noise by setting out clear planning policy relating to noise and incorporating environmental noise strategies into the development and planning.

## ***7.4 Review of possible mitigation measures***

Once the extent of the existing noise impact has been confirmed for those locations identified by the decision support matrix, any potential noise mitigation measures will be then investigated.

There is a wide range of potential noise mitigation measures, some of which may act at a national or regional level, others which may be purely localised. The designated authority can decide to implement these measures in those areas having high noise levels.

A non-exhaustive list of examples may include<sup>6</sup>:

- Vehicle noise emissions and tyre noise regulations based on EU levels
- National planning guidance or noise regulations based on a national level
- Transport policy objectives may be set at national level;
  - Improving public transport;
  - Getting people out of cars; and

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<sup>6</sup> Noise Action Planning in Malta, Acustica 536-1-29

- Increasing bus and bicycle journeys.

On a national and local level, the designated authority has powers to:

- Replace diesel vehicles with Compressed natural gas / electric;
- Control truck routes;
- Restrict night-time deliveries;
- Issue planning permissions keeping in mind noise effects;
- Enforce speed limits;
- Close roads and/or re-route traffic;
- Re-surface roads;
- Control planning zones;
- Impose façade insulation;
- Erect noise barriers;
- Form public liaison groups; and
- Have long-term targets.

Roads authorities could undertake the following:

- Traffic management – routes and HGVs;
- New road construction (bypass);
- Re-surface roads;
- Vehicle speed management;
- Noise screening measures; and
- Façade insulation measures.

These mitigation measures will be considered during the assessment of possible noise mitigation for sites identified through the decision support matrix. From the above list one can notice that all the stakeholders need to work together to the benefit of the nation.

## ***7.5 Discuss budgets, cost-effectiveness assessment, cost benefit analysis***

Reasonable noise mitigation actions will be carried out for those locations being reviewed. A cost benefit analysis is currently the best procedure considered to maximise good value for money and to benefit from investment. This analysis will be achieving the targets of lifetime construction and that of maintenance cost against noise reduction benefit.

Noise reduction measures may be very useful when considering the global source related measures, but it can also be even more effective if it is more detailed and complex over specific local measures. To determine estimates of noise reduction from identified design options one may use the strategic noise models.

Studies<sup>7</sup> show that monetisation of noise is the most common approach to process this analysis. These studies show that the monetary assessments of noise levels are based on two different approaches: (a) impact upon property market value and (b) whether residents are willing to pay for noise mitigation measures. Both approaches may lead to differing suggested levels of financial benefit.

When the cost-benefit analysis is undertaken, the appropriate valuation and research will be reviewed using the best available research data.

## **7.6 Planning for Environmental Noise Management**

The main objectives of the Directive state that the noise action plan should prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and to preserve environmental noise quality where it is good.<sup>8</sup>

To address the above, noise management is tackled in two stages:

- a) Protection of the future noise climate, and
- b) Reduction of the existing noise climate where necessary.

The protection of the future noise climate is achieved by preserving areas with good environmental noise levels and providing a reasonable protection from the potential impacts of new developments.

The planning system has a significant role on the control of exposure to environmental noise. If whilst planning is carried out, noise effects are considered, the adverse impacts of noise are avoided.

Two possible scenarios in development are; a) Bringing people to noise and b) Bringing noise to people.

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<sup>7</sup> Acustica Noise Action Planning report, 536-1-29, pg 28.

<sup>8</sup> Environmental Noise Directive 2002/49/EC, Article 1



## **8. Public Participation**

The Draft Noise Action Plan was published for public consultation on the MEPA website [www.mepa.org.mt](http://www.mepa.org.mt). The general public was invited to submit comments on this plan. The public consultation process started on 1<sup>st</sup> of June 2011. The public consultation initiative also included a number of presentations with key stakeholders. A presentation organised for the general public by the Malta Environment and Planning Authority in collaboration with the Malta-EU Steering and Action Committee (MEUSAC) was also held on the 13<sup>th</sup> June 2011. The public consultation process was open formally for a 4 week period. A number of media events were organized targeting information on the Draft Noise Action Plan. Further details are included in Annex VI.

## **9. Implementation Plan**

The noise action plan is set to take a staged approach. This is done by identifying potential locations for actions, reviewing possible actions and determining the cost effectiveness of actions before determining any proposed action for the mitigation of the existing levels of environmental noise due to major roads in Malta.

The Noise Action Plan has a long-term vision that spans over a period of ten years and aims to prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and the preservation of environmental noise quality where it is of a good level. This vision encompasses short term objectives that are to be implemented by 2012, medium term objectives to be implemented within five years (2012 to 2017) and long term objectives that are to be achieved in ten years' time.

### **9.1 Roles and Responsibilities**

As set out within the Assessment and Management of Environmental Noise Regulations, 2004 (as amended). MEPA is the authority responsible for developing the noise action plan and all measures relating to the implementation of the action plans.

### **9.2 Targets and Objectives**

The plan outlines a long-term strategy regarding the management of noise which aims to prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good.

It also sets out short, medium and long-term objectives for monitoring and management of environmental noise in Malta. In the short-term the objective is to focus on the finalization of all reporting obligations under the first round of the Environmental Noise Directive by 2012. In the medium term, envisaged to commence in 2012 and finalised in 2017, MEPA plans to undertake the strategic noise mapping for the second round of reporting in terms of this Directive. The detailed objectives of the medium term are to:

- a) Improve stakeholder engagement and improve collaboration by establishing a cross-departmental working group on strategic noise mapping;
  - o Encourage the development of a national policy statement on noise;
  - o Encourage the adoption of noise as a public health issue; and
  - o Encourage the development of guidance on the assessment of neighbourhood noise, entertainment noise and noise nuisance.

- b) Utilise improved input data delivered via GIS enabling of Government agencies, the proposed Inspire portal and especially the wider environmental monitoring programme, specifically LiDAR survey results;
- c) Develop capacity within MEPA to deliver the requirements of the noise action planning process set out within the strategy,
  - o Procure the noise measurement equipment and noise mapping software
  - o Redeploy additional trained personnel who are required to undertake the specialised work set out; and
  - o Provide staff training to enable effective use of the technical measurement equipment and noise mapping software procured.
- d) Develop planning guidance to help protect the future noise environment:
  - o Guidance on assessment of existing noise effecting proposed residential developments; and
  - o Guidance on control of envisaged noise impacts from proposed developments on existing residential areas.
- e) Work closely with the Planning section to ensure all applications with a noise aspect, whether being a noise producer or a noise recipient, are assessed by specialist staff within the noise team.

In the longer term, possibly looking over a 10-year period medium, the objectives should be the following:

- a) Develop a unified spatial data infrastructure for sharing relevant datasets between stakeholders;
- b) Improve quality of underlying datasets;
- c) Improve quality of mapping results through training, better input data and verification through source emission measurements and medium term immission measurements;
- d) Develop planning guidance to help protect the future noise environment:
  - o Guidance on assessment of existing noise effecting proposed residential developments; and
  - o Guidance on control of envisaged noise impacts from proposed developments on existing residential areas
- e) Assess the potential for introducing noise limits to control impact on noise sensitive locations;
- f) Assess the potential for expanding the noise management zones to cover the whole of the Maltese islands;
- g) Increase institutional capacity to become increasingly self sufficient for noise action planning and strategic noise mapping:
  - o Develop expertise in strategic noise mapping through procurement of personnel and training;
  - o Develop expertise in noise action planning and noise mitigation through redeployment of personnel and provision of training;
- h) Report results of strategic noise mapping to the EC on 5-year cycle in line with deadlines.

Additional information on the strategy of monitoring and management of noise in relation to the END can be found in the three reports delivered by Acustica Ltd. These are the Implementation of Directive 2002/49/EC in Malta 536-1-27/2, Strategic Noise Mapping in Malta 536-1-28/2 and Noise Action Planning in Malta 536-1-29<sup>9</sup>.

### **9.3 Programme of Works**

In terms of actions envisaged, the Noise Action Plan is to be implemented through a staged process over a period of 5 years as shown below:

Year 1: Extent of noise exposure when assessment is considered necessary

- Confirm onset of assessment criteria
- Confirm preservation criteria for good noise levels

Year 2: Review strategic noise maps to identify priorities

- Decision support matrix
- Draw up a list of potential areas for action, both above the onset values and below the level for preservation to help identify quiet areas.

Year 3: Confirmation of extent of impact

- Following the prioritization exercise based upon the results of the strategic noise mapping, an ordered shortlist of areas may be drawn up. The aim of this stage is to confirm that the noise levels assessed by the strategic noise mapping experienced by the properties and population within the areas are being addressed.

Year 4: Review possible mitigation measures and cost benefit analysis undertaken for each mitigation measure

Year 5: A recommendation for action

- Following the cost-benefit analysis the locations under review may be prioritized to form a list of beneficial and achievable actions for noise mitigation. With the cost and timescale implications of each action resulting from the analysis carried out, the mitigation measures may then be put forward to the relevant departments and fund holders to be incorporated within their future plan.

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<sup>9</sup> Documents available from <http://www.mepa.org.mt/topic-noise>

## **9.4 Evaluation, Review and Corrective Action Programmes**

A steering committee composed of representatives from three authorities in Malta; Transport Malta, Department of Health and headed by Malta Environment and Planning Authority (including environment / planning directorate and mapping unit) is expected to be set up and tasked with overseeing the implementation of this plan. The objectives of this steering committee is (a) to review the effectiveness of noise action planning activities on on-going activities by performing an annual review of the progress made in relation to programmed activities (b) to improve stakeholders engagement and improve collaboration on strategic noise mapping and noise action planning and (c) to consider the effectiveness of the proposed measures for combating local environmental noise exposure.

In an effort to ensure the proper achievement of the objectives of the plan, it may be opportune to adjust the timing of planned activities in order to optimise delivery.

## 10. Summary and Conclusions

The Noise Action Plan has been prepared in accordance with the requirements of the Environment Noise Directive 2002/49/EC (END) which was transposed through Legal Notice 193 of 2004, Assessment and Management of Environment Noise Regulations, 2004 (as amended).

The purpose of this Noise Action Plan is to provide an overview of the requirements and obligations of the Regulations, to present a summary of the results of the strategic noise mapping within Malta, and to illustrate actions, which the authorities responsible intend to take in the next five years.

MEPA's long-term strategy regarding the management of noise is to prevent and reduce environmental noise where necessary and particularly where exposure levels can induce harmful effects on human health and preserving environmental noise quality where it is good.

It also sets out short, medium and long-term objectives for monitoring and management of environmental noise in Malta. In the short-term the objective is to focus on the finalization of all reporting obligations under the first round of the Environmental Noise Directive by 2012. In the medium term, MEPA plans to undertake the strategic noise mapping for the second round of reporting in terms of this Directive. The detailed objectives for the medium term are to:

- a) Improve stakeholder engagement and improve collaboration by establishing a cross-departmental working group on strategic noise mapping;
  - Encourage the development of a national policy statement on noise; and
  - Encourage the development of guidance on the assessment of neighbourhood noise, entertainment noise and noise nuisance.
- b) Utilise improved input data delivered via GIS enabling Government agencies, the proposed Inspire portal and especially the wider environmental monitoring programme, specifically LiDAR survey results;
- c) Develop capacity within MEPA to deliver the requirements of the noise action planning process set out within the strategy;
  - Procure the noise measurement equipment and noise mapping software;
  - Redeploy additional trained personnel required to undertake the specialised work set out; and
  - Provide staff training to enable effective use of the technical measurement equipment and noise mapping software procured.
- d) Develop planning guidance to help protect the future noise environment:
  - Guidance on assessment of noise on proposed residential developments; and
  - Guidance on assessment and control of noise impacts from proposed developments on existing residential areas.

e) Work closely with the Planning Directorate within MEPA to ensure that specialist staff within the noise team, assesses all planning applications having a potential noise issue, whether being a noise producer or a noise recipient,

In the longer term, possibly looking over a 10-year period, the objectives shall be the following:

- i) Develop a unified spatial data infrastructure for sharing relevant datasets between stakeholders;
- j) Improve quality of underlying datasets;
- k) Improve quality of mapping results through training, better input data and verification through source emission measurements and medium term immission measurements;
- l) Develop planning guidance to help protect the future noise environment:
  - Guidance on assessment of noise on proposed residential developments; and
  - Guidance on control of envisaged noise impacts from proposed developments on existing residential areas
- m) Assess the potential for introducing environmental noise limits to control impact on noise sensitive locations;
- n) Assess the potential for expanding the noise management zones to cover the whole of the Maltese islands to provide consistent protection for all inhabitants;
- o) Increase institutional capacity to become increasingly self sufficient for noise action planning and strategic noise mapping:
  - Develop expertise in strategic noise mapping through engagement of personnel and training;
  - Develop expertise in noise action planning and noise mitigation through engagement of personnel and training;
- p) Report results of strategic noise mapping to the EC on a 5-year cycle in line with deadlines.

The noise action plan is set to take a staged approach in assessing the existing levels of environmental noise due to major roads in Malta. This is achieved by assessing the strategic noise maps of the first reporting round with a view of identifying potential locations for actions using the prioritisation exercise. The proposed onset levels for assessment of noise mitigation measures due to exposure to road traffic noise are (a)  $L_{den} = 65$  dB and (b)  $L_{night} = 55$  dB.

The next step entails the confirmation of the noise levels assessed by the strategic noise maps of 2006 that are experienced by the properties and population within the areas being addressed. This step will lead to a review of possible mitigation actions that are then subject to a cost benefit analysis.

The identification and noise preservation of the quiet areas in the vicinity of a major road is considered to be below the proposed onset level at (a)  $L_{den}$ ; 55 dB and (b)  $L_{night}$ : 45 dB. The preservation of relatively quiet areas in open countryside will be also considered.

## Annex I: Glossary of acoustic and technical terms

<b>Term</b>	<b>Definition</b>
Agglomeration	Major Continuous Urban Area as set out within the Regulations
Data	Data comprises information required to generate the outputs specified, and the results specified
dB	Decibel
EC	European Commission
END	Environmental Noise Directive (2002/49/EC)
ESRI	Environmental Systems Research Institute
GIS	Geographic Information System
GPG	Good Practice Guidebook
ISO	International Standards Organisation
Noise Mapping Software	Computer program that calculates required noise levels based on relevant input data
Processing Data	Any form of manipulation, correction, adjustment factoring, correcting, or other adjustment of data to make it fit for purpose. (Includes operations sometimes referred to as 'cleaning' of data)
WG – AEN GPG	Working Group – Assessment of Exposure to Noise Good Practice Guidebook
XPS 31-133	The French road traffic noise calculation method published in 'NMPB-Routes-96 (SETRA-CERTULCPC-CSTB)', referred to in 'Arrêté du 5 mai 1995 relatif au bruit des infrastructures routières, Journal Officiel du 10 mai 1995, Article 6' and in the French standard 'XPS 31-133'.

**Table 5: Glossary of acoustic and technical terms**



## Annex II: Bibliography and references

### Legislation

LN 193 of 2004, Environment Protection Act, 2001 (CAP 435), Assessment and Management of Environmental Noise Regulations, 2004.

SL 435.59, Assessment and Management of Environment Noise Regulations, April 2004, as amended 2007.

### MEPA Publications

Environmental Impact Assessment, MEPA, March 1996.

Environmental Management Construction Site Regulation, 2007

Structure Plan for the Maltese Islands [www.mepa.org.mt/lpg-structureplan](http://www.mepa.org.mt/lpg-structureplan) [Accessed in May 2011]

### Guidance Documents

Implementation of Directive 2002/49/EC in Malta 536-1-27/2, Acustica Ltd.

Strategic Noise Mapping in Malta 536-1-28/2, Acustica Ltd.

Noise Action Planning in Malta 536-1-29, Acustica Ltd.

WG-AEN GPG <http://ec.europa.eu/environment/noise/mapping.htm> [Accessed in May 2011]

ISO 1996. Acoustics - Description and Measurement of Environmental Noise:- International

Standards Organisation, Geneva (1982 – 1987)

Part 1 - Basic quantities and procedures;

Part 2 - Acquisition of data pertinent to land use; and

Part 3 - Application to noise limits.

ISO 1996, Acoustics - Description and Measurement of Environmental Noise:- Part 2 - Acquisition of data pertinent to land use, Amendment 1 (1998-09-15).

BS 4142:1997. Method for Rating industrial noise affecting mixed residential and industrial

areas, British Standards Institution (BSI), London 1997.

# Annex III: Strategic noise maps

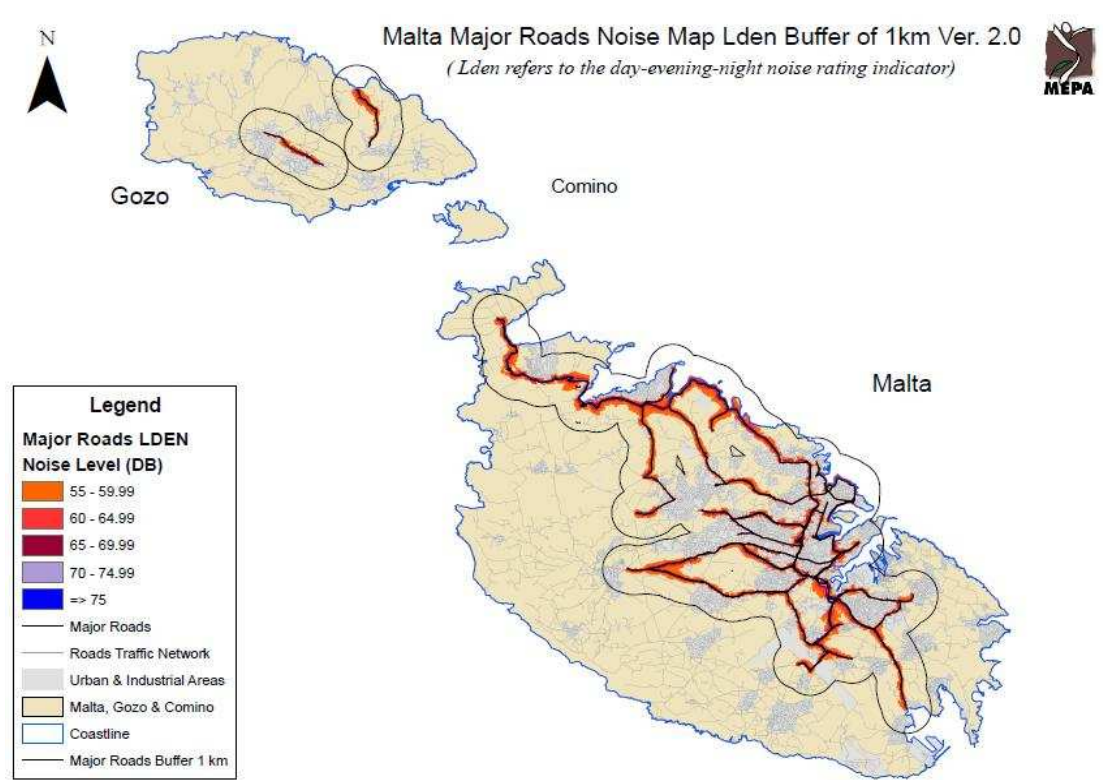


Figure 1 Major Road Network for 2006 (used for strategic noise mapping)

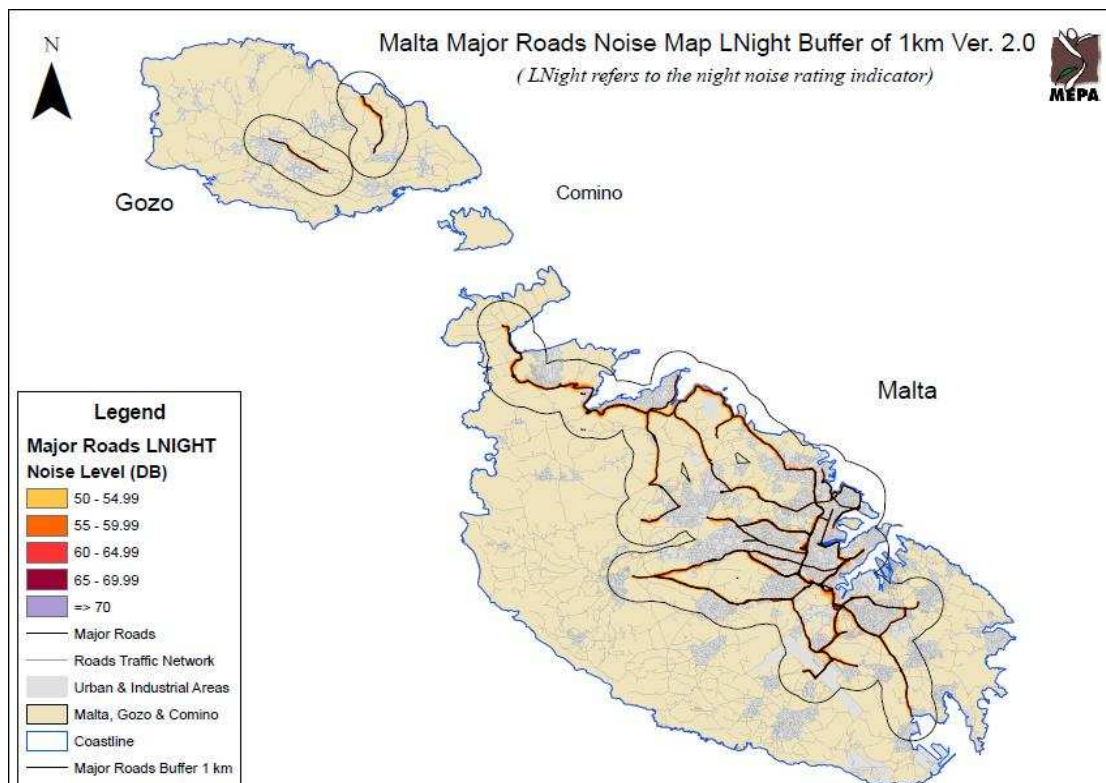
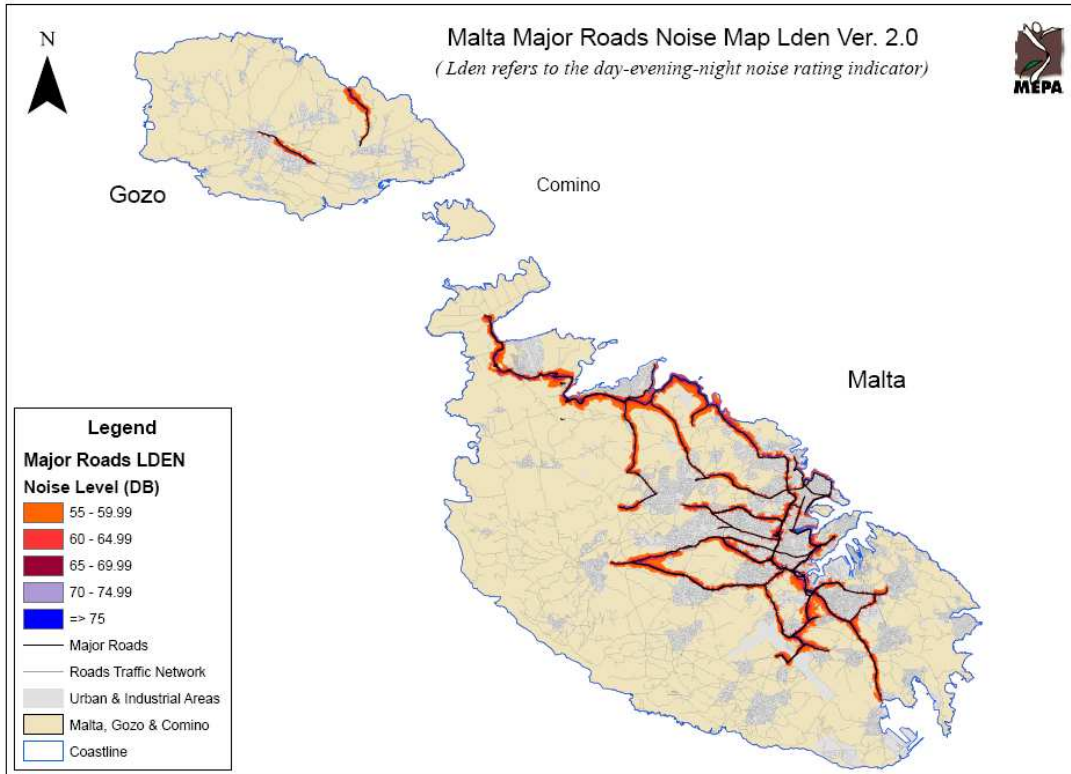
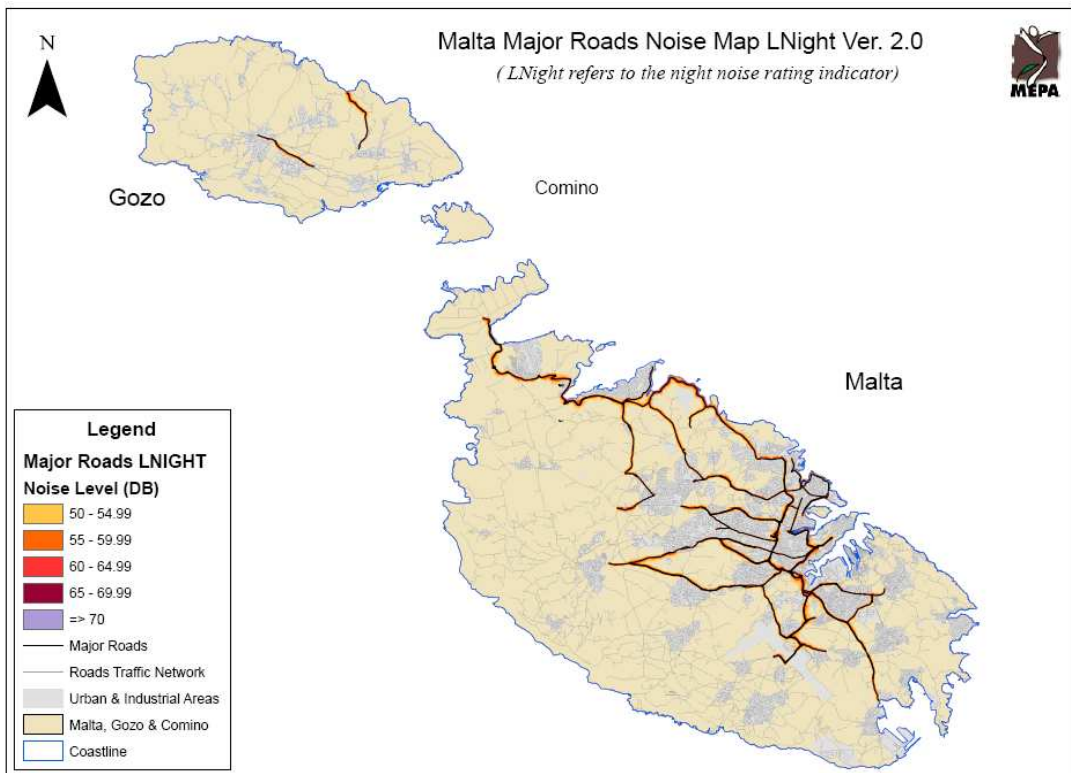


Figure 2 Major Road Network for 2006 (used for strategic noise mapping)

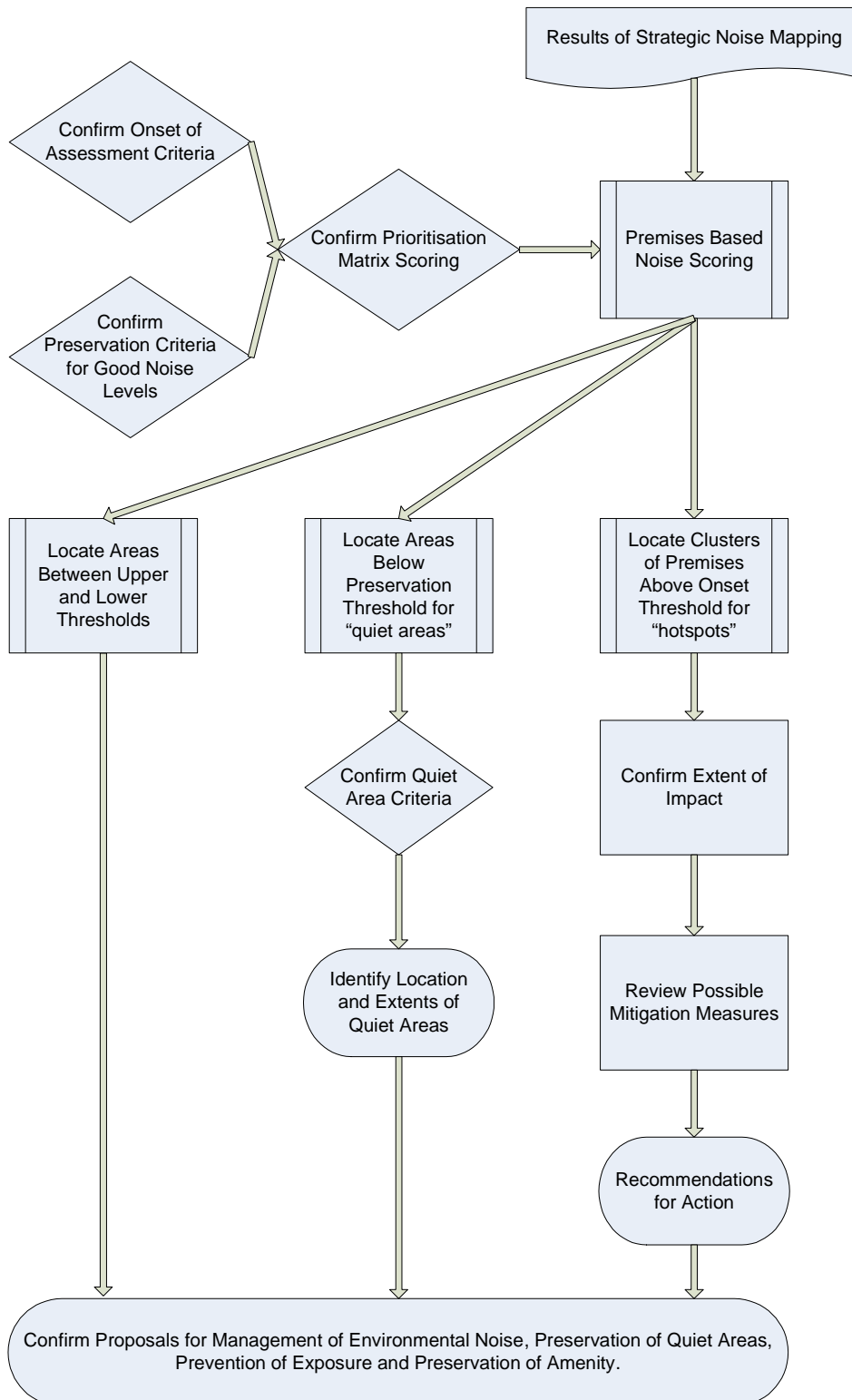


**Figure 3 Major Roads Noise Map  $L_{den}$**



**Figure 4 Major Roads Noise Map  $L_{night}$**

# Annex IV: Overview/flow diagram of process for action planning decision making



## Annex V: Final Decision/Selection Matrix

A decision support matrix is a table enabling identification, analysis and rating of the strength of relationships between various sets of information. It enables a number of different factors to be examined and facilitates the assessment of the relative importance of each.

A score of equal or greater than 17 indicates that the threshold levels have been exceeded and that the location should be included in the shortlist for further assessment.

		Priority Matrix		
		Location:		
Decision Selection Criteria		Score Range Lden	Score Range Lnight	SubTotal
Noise Band(dB(A))	<45	5	6	
	45 - 49	4	5	
	50 - 54	3	4	
	55 - 59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75 - 79	4	6	
>=80	5	7		
Type of Location	City Centre	1	1	
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	3	3	
	Quiet Area	3	3	
Recreational open space	2	2		
Type of Noise Source	Air	3	4	
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			<b>Total Score</b>	0

Table 6: Example of a Decision Support Matrix

An example of the use of the matrix for a residential property exposed to road traffic noise levels of 71 dB L<sub>DEN</sub> and 63 dB L<sub>night</sub> is shown in Table 2.

		Priority Matrix		
		Location:		
Decision Selection Criteria		Score Range Lden	Score Range Lnight	SubTotal
Noise Band(dB(A))	<45	5	6	3
	45 - 49	4	5	
	50 - 54	3	4	
	55 - 59	2	2	
	60-64	1	3	
	65-69	2	4	
	70-74	3	5	
	75 - 79	4	6	
	>=80	5	7	
Type of Location	City Centre	1	1	5
	Commercial	1	2	
	Residential	2	3	
	Noise Sensitive Location	3	3	
	Quiet Area	3	3	
	Recreational open space	2	2	
Type of Noise Source	Air	3	4	7
	Industry	2	3	
	Rail	2	3	
	Road	3	4	
			<b>Total Score</b>	<b>18</b>

Table 7 Example of use of Decision Support Matrix

A score of approximately 17 or above indicates that the threshold levels have been exceeded and the location should be included in the shortlist for further assessment.

## Annex VI: Summary of results of the Public Consultation

Ref.	Respondent	Summary of Proposal	MEPA comments
65/11/05	Joseph Farrugia	Noise action plan should target entertainment noise and noise coming from machinery.	Comment noted, however this is beyond the scope of the Environmental Noise Directive.
65/11/06	Noel Schembri	Waste – Various types of waste is being collected together, without separating the waste.  Air – MEPA should monitor activities from construction sites.  Radiation – MEPA should monitor mobile phone antennas.  Noise – A time needs to be set during which Heavy Duty Vehicles operate.	Comments regarding Waste, Air and Radiation are beyond the scope of the Environmental Noise Directive, which is focused on the noise action plan. The comment relating to noise has been noted.
65/11/07	Chris Calleja	Reference should be made to ISO 8297 instead of BS 4142.	Comment noted.
65/11/08	Ramon Casha	Malta needs to have a policy on noise that includes all sources of noise such as car stereos, modified car silencers, car horns, street parties, church bells, fireworks and heavy equipment.	Comment noted, however this is beyond the scope of the Environmental Noise Directive.
65/11/10	Frank Camilleri	An excellent initiative and look forward to its implementation.	Comment noted..
65/11/11	Giacomo Spina	Stipulate a decibel limit both for day and night and establish that tampering with the silencer is an offence.	Comment noted, however this is beyond the scope of this consultation and should be dealt with through the VRT.
65/11/12	Grace Bartolo	Install speed cameras and sleeping policemen.	Comment noted.
65/11/13	Mavis Barrett	Consultation process should be done in English. When will aircraft noise be considered?	Most consultation is carried out in English however the presentation given at MEUSAC was in Maltese, as per usual procedure. Aircraft noise might be included in the noise action plan in the next reporting rounds.
65/11/14	Joseph Cassar	Penalise those people having tampered silencers.	Comment noted, however this is beyond the scope of this consultation and should be dealt with through the VRT.
65/11/15	Daniel Micallef	Make use of sound proof road surfaces.	Comment noted, however this will be considered at a later stage of the implementation of the Noise Action Plan.
65/11/16	John Vella – Bormla Local Council	Sound coming from car stereos should be controlled.	Comment noted.
65/11/17	Josephine Tonna	This action plan is a very positive way forward.	Comment noted..

65/11/20	Shawn Borg	Penalise motorists having modified car silencers.	Comment noted, however this is beyond the scope of this consultation and should be dealt with through the VRT.
65/11/21	Joseph Galea	Divert traffic from Triq Censu Busuttill to another wider road.	Comment noted, however this is outside the scope of the Noise Action Plan. However your comment will be considered once MEPA is implementing the programme of works.
65/11/22	Mick Hollis	Take noise readings from vehicles and penalise those which are above certain noise limit values.	Comment noted, however this is beyond the scope of this consultation and should be dealt with through the VRT.
65/11/23	Josianne Grech	Investigate Misrah il-Kittieba Qormi for noise on a 24hour basis.	Comment noted, however this will be considered once MEPA is implementing the programme of works as mentioned in the Noise Action Plan.
65/11/24	Louise Schembri	I would like to ask who is the person responsible for regulating noise from bells.	Comment noted. Kindly note that neighbourhood noise is regulated either by the Department of Health or by the Police.
65/11/25	Michael Agius	Better road management especially in Qawra where some roads have awkward bends and inclines.	Comment noted, however this will be considered once MEPA is implementing the programme of works as mentioned in the Noise Action Plan.
65/11/27	John Fenech	<ol style="list-style-type: none"> <li>1. Foreword – 4 Noise Management legislation – Directives relating to noise emissions (Implementation of the Directives related to noise emission- 70/157/EEC of 6 February 1970 permissible sound level and the exhaust system of motor vehicles 92/61/EEC of 30 June 1992 type-approval of two or three-wheel motor vehicles 2000/14/EC noise emission in the environment by equipment for use outdoors).</li> <li>2. Data admissibility Article 5 (Until the use...These data must not be more than three years old).</li> <li>3. Foreword- 7 Data evaluation (Data about environmental noise levels should therefore be collected, collated or reported in accordance with comparable criteria. This implies the use of harmonised indicators and evaluation methods).</li> <li>4. Urbanised area – population density (Article 3 : (k) 'agglomeration' shall mean part of</li> </ol>	<ol style="list-style-type: none"> <li>1. Only Directive 2002/49/EC is within MEPAs remit. The directives mentioned are outside MEPAs remit, outside the scope of the noise action plan and outside the scope of this consultation.</li> <li>2. Article 5 of END does not deal with "data admissibility" it sets the framework for a Common European Noise assessment framework, which is still in its embryonic stages. It is outside the scope of the public consultation.</li> <li>3. Regarding citation (7) of the EN-D. We have no qualms with that. It is an overall objective of the EU as a whole.</li> </ol>



		<p>a territory, delimited by the Member State, having a population in excess of 100 000 persons and a population density such that the Member State considers it to be an urbanised area).</p> <p>5. Revision of action plan (Article 8: The action plans shall be reviewed, and revised if necessary, when a major development occurs affecting the existing noise situation, and at least every five years after the date of their approval).</p> <p>6. Sufficient time &amp; effective opportunities to participate – between 2006 and 2011 - the time -window for public participation is of 30 days! (Article 8: Member States shall ensure that the public is consulted about proposals for action plans, given early and effective opportunities to participate in the preparation and review of the action plans, that the results of that participation are taken into account and that the public is informed on the decisions taken. Reasonable time-frames shall be provided allowing sufficient time for each stage of public participation).</p> <p>7. Technical observations :</p> <ul style="list-style-type: none"> <li>- Noise map grid (ANNEX I : The height of the <math>L_{den}</math> assessment point depends on the application)</li> <li>- Noise control programmes (ANNEX VI :1.3. Noise-control programmes that have been carried out in the past and noise-measures in place).</li> </ul> <p>8. If the authorities adopt the criterion that continuous urbanised areas must not be separated by more than 200 meters than several localities in Malta will be excluded from both agglomerations (250,000 &amp; 100,000). Consequently, 27% of the Maltese population will not benefit from the noise abatement action.</p> <p>9. As demonstrated by the frequent noise nuisance complaints we lack the legislation of effective noise management and</p>	<p>Our Strategic Noise Mapping (SNM) exercise reflected the principles set out by this citation.</p> <p>4. Regarding the agglomeration, one of our reports recommends that Malta has one agglomeration having a population of 243 746 inhabitants <math>65.8\text{km}^2</math> for a population density <math>&gt;3700</math> inhabitants/<math>\text{km}^2</math>. According to the criteria set by END this agglomeration is below the threshold for strategic noise mapping within agglomeration for the first round of Strategic Noise Mapping due to the fact that it is <math>&lt; 250</math> k inhabitants but will surely be included in the round of the SNM exercise. The document forwarded also includes the agglomeration of local authorities having a population density <math>&gt; 500</math> persons/<math>\text{km}^2</math> and separated by less than 200m to form a CONTINUOUS URBAN AREA. From the definition given in article 3(k) it is clear that the agglomeration should lie in the urbanised part of the territory. This means that if only a part of a particular local council is included in the development zones then only the latter part is to be included in the agglomeration. Given that in Malta it is possible to find localities in which there is a sharp boundary between the urbanised and the non-urbanised areas (e.g, but not</p>
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		<p>enforcement therefore any action plans derived from the said action plans will be another set of documents for the sake of administrative convenience. Kindly note that this is outside MEPA's remit and is beyond the scope of the public consultation</p> <p>Proposal:</p> <p>A. Therefore, we suggest that the UK Identification of agglomeration method is applied. That is, the urban areas are those as delimited by the local council borders which have a population density of more than 500/Km<sup>2</sup>. Accordingly, almost all the localities will be included in the agglomeration. (Identification of agglomerations in the UK- page 2 &amp; 8:<a href="http://archive.defra.gov.uk/environment/quality/noise/research/agglomeration/documents/agglomeration.pdf">http://archive.defra.gov.uk/environment/quality/noise/research/agglomeration/documents/agglomeration.pdf</a>)</p> <p>B. It is evident that traffic and road type data are outdated or lack the depth of information as underline by the software Toolkits. Therefore, we propose setting up a structured organization to acquire the essential and reliable traffic and road type data to compute accurate noise maps for meaningful noise action planning (<a href="http://ec.europa.eu/environment/noise/pdf/gpg2.pdf">http://ec.europa.eu/environment/noise/pdf/gpg2.pdf</a>).</p>	<p>solely Gharghur) then using the population density of the locality is not considered to be the adequate criterion upon which to base the selection of the urbanised and non urbanised areas. In Malta we had to choose the urbanised from the nonurbanised areas by plotting the development zones on GIS, areas within the development zones are considered to be urbanised. Given that the definition in article 3(k) implies a continuum of urban fabric, areas within 200m of each (including a 100m buffer around each area) where considered to be part of the same continuum. Through this process we got that urbanised continuum within the Maltese territory. To this we added parks and quiet areas to get the current noise agglomeration. This delineation respects all the required criteria for the delineation of the agglomeration. If one were to use the population density of the local council as the defining criterion for the delineation of the agglomeration, then one would end up including the whole council within the agglomeration irrespective of whether the locality is wholly or partly included within the development zone, which is not what is implied by the definition in article 3(k) which asks for the inclusion of only the</p>
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			<p>urbanised areas within the agglomeration. To note also that, the attached document that you supplied applies to countries having numerous agglomerations, and surely not to Malta.</p> <ol style="list-style-type: none"> <li>5. We are aware of Article 8(5) of END and are committed to its full implementation.</li> <li>6. We believe that the time allocated is both sufficient and also in line with legislation. Having said so MEPA is continuously open to recommendations from the public and these will be reflected in future policy.</li> <li>7. We are aware of Annex 1 of END and this is how our SNMs were compiled. We are aware of this reporting obligation which was duly submitted to the CDR/EIONET last May.</li> <li>8. Kindly refer to comment in 4.</li> <li>9. Data was not outdated. it was the 2006 data which should have been used to compute the 2007 SNM. It is MEPA's long term aim to improve its noise mapping functions and this will entail plugging in any data gaps.</li> </ol>
65/11/30	Dr Richard Zammit	The discounting of the Malta International Airport as a noise producer should be reconsidered.	Comment noted. The Environmental Noise Directive currently does not require the airport to be mapped, however it might be mapped in the next reporting round.
65/11/32	Sliema Residents Association	<ol style="list-style-type: none"> <li>1. Appendix VII of the draft action plan should be more user friendly.</li> <li>2. Introduce effective traffic management plans. Enforcement of the Motor Vehicle Regulations.</li> <li>3. More recent data should be used as the noise action plan is based on 2006 traffic data.</li> <li>4. MEPA should revise its urban</li> </ol>	<ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. Comment noted, however this will be considered once MEPA is implementing the programme of works as mentioned in the Noise Action Plan.</li> <li>3. Strategic noise</li> </ol>

		development planning policies to ensure sustainable development. Noise limit values for vehicles undergoing the Vehicle Roadworthiness Test should be lowered. All authorities involved should promote good vehicle maintenance and better driving practices.	mapping should have been done not later than June 2007, showing the situation in the preceding calendar year. 4. Comment noted.
Micallef Malcolm	65/11/33	The Noise Action Plan has completely excluded the consideration of sensitive populations such as homes for the elderly.	Noise sensitive areas are included in the noise action plan as required by the Environmental Noise Directive.
Department of Health	65/11/34	<ol style="list-style-type: none"> <li>1. One can only mitigate exposure to noise not mitigate health effects.</li> <li>2. Why is the air quality agglomeration not taken for the noise action plan?</li> <li>3. Include elderly residences under the definition of quiet areas.</li> <li>4. Table listing major roads should also include localities where the major roads are situated.</li> </ol>	<ol style="list-style-type: none"> <li>1. Comment noted.</li> <li>2. The noise Directive sets different criteria for the agglomeration than the one for air quality.</li> <li>3. A quiet area is set with the proposed onset levels in the Noise Action Plan. However homes for the elderly will be included under the sensitive areas to produce a list of potential quiet areas.</li> <li>4. This will be included in the final Noise Action Plan.</li> </ol>
Kummissjoni Interdjoesana Ambjent	65/11/35	<ol style="list-style-type: none"> <li>1. Draft Action Plan should be renamed Action Plan to Control Noise from Traffic, in Compliance with EU Directive.</li> <li>2. The noise maps should be validated by taking actual noise level readings from various streets.</li> <li>3. The action plan fails to justify the onset levels set for <math>L_{den}</math> and <math>L_{night}</math>.</li> </ol>	<ol style="list-style-type: none"> <li>1. The Action Plan is named according to the guidelines given in the Environmental Noise Directive.</li> <li>2. Some areas will be validated with measures from the noise level metre, during the process of the implementation of the noise action plan.</li> <li>3. Onset of assessment levels are based upon the background guidance and these aim to meet the END requirements to identify the most important areas from the strategic noise mapping in order to kick start the action planning process. It is important to note that these "onset levels" are not and should not be considered as noise limit values, and they</li> </ol>

			do not have any legal status. Moreover, until a more specific evidence base is in place, such as a noise attitude survey in Malta, and a more fully developed noise exposure dataset, a noise level value for onset of assessment is developed from a balance of information regarding health effects, annoyance response and attitudes to noise. In developing noise limit values additional issues such as impact upon development would also need to be considered.
Ian Zammit	65/11/36	Maps are not in high resolution thus one cannot distinguish between colour codes. Appendix VII should include the locality the roads are in. There are a few surprising result and these should be checked. Roads not having 6 million car passages a year should be included if construction trucks pass through them. Noise recorders should be used by traffic wardens for noise enforcement.	Currently MEPA is working on issuing higher definition noise maps. Other comments are noted.
Transport Malta (TM)	65/11/38	<p>1. MEPA should co-operate with all stakeholders to carry out studies into the noise situation in Malta and consequently come up with adequate proposals.</p> <p>2. The Road and Infrastructure Directorate (RID) would appreciate guidance on the best model to use for the calculation or prediction of noise levels.</p> <p>3. TM also suggested that MEPA should develop standards for noise mitigation measures. MEPA should also monitor noise levels before and after noise mitigation measures are implemented, such as noise barriers.</p> <p>4. TM mentioned other possible noise abatement measures, amongst which are façade insulation, traffic management, speed limits and noise reducing pavements.</p>	<p>1. MEPA already started this by delivering the strategic noise maps and the draft noise action plan.</p> <p>2. This is outside the scope of the public consultation; however MEPA is keen to work closely with RID on this matter.</p> <p>3. This will be done through the implementation of the Environmental Noise Directive through the implementation of the strategic noise mapping and of the noise action plan.</p> <p>4. These will be taken onboard during the stage 4 of the programme of works during the implementation of the NAP.</p>

		<p>5. TM suggests that in collaboration with MEPA, noise measurements are taken from roads. TM have already procured the equipment needed for noise level measurements as well as necessary staff training.</p>	<p>5. MEPA is willing to collaborate with TM as long as the noise measurements are related to the implementation of the noise action plan.</p>
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## Appendix VII: Major roads

ROAD_NAME	FLOW	COUNCIL
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ IL-BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ BURMARRAD	8505960	SAN PAWL IL-BAHAR
TRIQ HAL QORMI. QORMI	8948705	MARSA
TRIQ DUN KARM	11618680	SAN GWANN
TRIQ DUN KARM	11618680	BIRKIRKARA
TRIQ DUN KARM	11618680	IKLIN
TRIQ DUN KARM	11618680	BIRKIRKARA
TRIQ DUN KARM	11618680	BIRKIRKARA
TRIQ DUN KARM	11618680	BIRKIRKARA
TRIQ DUN KARM	11618680	IKLIN
TRIQ DUN KARM	11618680	IKLIN
TRIQ DUN KARM	11618680	BIRKIRKARA
TRIQ GHAJN TUFFIEHA	15797445	SAN PAWL IL-BAHAR
TRIQ GHAJN TUFFIEHA	15797445	SAN PAWL IL-BAHAR
TRIQ GHAJN TUFFIEHA	16265495	SAN PAWL IL-BAHAR
TRIQ GHAJN TUFFIEHA	16265495	SAN PAWL IL-BAHAR
TRIQ TA' BERT	8060660	ATTARD
VJAL L-ISTADIUM NAZZJONALI	12455990	ATTARD
VJAL L-ISTADIUM NAZZJONALI	12455990	ATTARD
VJAL L-ISTADIUM NAZZJONALI	12455990	ATTARD
VJAL L-ISTADIUM NAZZJONALI	12455990	ATTARD
TRIQ IZ-ZAGHFRAN	6297710	ATTARD
TRIQ L-IMDINA	6297710	ATTARD
TRIQ HAL QORMI	10329500	ATTARD
TRIQ EMVIN CREMONA	10329500	BALZAN
TRIQ VALLETTA	10329500	ATTARD
SPTAR MOUNT CARMEL	12455990	ATTARD
TRIQ L-IMDINA	6297710	ATTARD
TRIQ IZ-ZIR	12455990	ATTARD
TRIQ IL-BELT VALLETTA	10329500	ATTARD
TRIQ IN-NUTAR ZARB	6297710	ATTARD
TRIQ IS-SALVATUR	6297710	ATTARD
TRIQ IS-SALVATUR	6297710	ATTARD
TRIQ L-IMDINA	10329500	ATTARD
TRIQ IN-NUTAR ZARB	6297710	ATTARD
TRIQ L-IMDINA	7300000	BALZAN
TRIQ WIED HAL-BALZAN	11123375	LIJA
MRIEHEL BY-PASS	15496440	BALZAN
TRIQ SAN FRANGISK	6346255	BALZAN
TRIQ L-IMDINA	7300000	BALZAN

TRIQ WIED HAL-BALZAN	11123375	BALZAN
TRIQ IL-MITHNA	11123375	BIRKIRKARA
PJAZZA SANT' ANTININ	12861509	PAOLA
TRIQ L-IMDINA	7300000	BIRKIRKARA
MRIEHEL INDUSTRIAL ESTATE	7300000	BIRKIRKARA
MRIEHEL INDUSTRIAL ESTATE	7300000	BIRKIRKARA
TRIQ L-ISQOF LABINI	11123375	BIRKIRKARA
TRIQ IL-WIED	11123375	BIRKIRKARA
SQAQ IL-WIED NRU. 2	7185755	BIRKIRKARA
TRIQ LAURENT ROPA	6029185	BIRKIRKARA
TRIQ DUN KARM	12592500	BIRKIRKARA
TRIQ DUN KARM	12592500	SAN GWANN
SQAQ TA' HOTBA	14287219	BIRKIRKARA
MRIEHEL BY-PASS	15496594	BIRKIRKARA
TRIQ DUN KARM	13322500	BIRKIRKARA
SQAQ IL-GHOGLA	13322500	BIRKIRKARA
TRIQ IL-WIED	6789000	BIRKIRKARA
TRIQ DUN KARM	12592500	BIRKIRKARA
TRIQ AZZOPARDI	8166875	BIRKIRKARA
TRIQ IL-WIED	11123375	BIRKIRKARA
TRIQ L-IMDINA	8644295	SANTA VENERA
TRIQ DUN KARM	12592500	BIRKIRKARA
TRIQ GHAR DALAM	8415440	BIRZEBBUGIA
TRIQ GHAR DALAM	8415440	BIRZEBBUGIA
TRIQ GHAR DALAM	8415440	BIRZEBBUGIA
TRIQ BURMARRAD	7391980	SAN PAWL IL-BAHAR
TRIQ BURMARRAD	7948970	SAN PAWL IL-BAHAR
TRIQ HAZ-ZABABR	8555965	FGURA
TRIQ SANT' ANTININ	8555965	FGURA
VJAL IT-28 TA' APRIL	8671670	FGURA
TRIQ HAZ-ZABBAR	8671670	FGURA
TRIQ HAZ-ZABBAR	8671670	PAOLA
TRIQ HAZ-ZABBAR	8555965	FGURA
TRIQ HAZ-ZABBAR	8555965	FGURA
TRIQ HAZ-ZABBAR	8671670	FGURA
TRIQ HAZ-ZABBAR	8671670	FGURA
WESGHAT IL-KUNSILL TA' L-EWROPA	8555965	FGURA
TRIQ SANT' ANTININ	8555965	FGURA
TRIQ ID-DEJMA	7779245	ZEJTUN
TRIQ SANT' ANTININ	12594325	FGURA
TRIQ ID-DEJMA	7779245	FGURA
TRIQ IL-FOSS	12594325	ZABBAR
TRIQ SA MAISON	11734020	PIETA
VJAL NELSON	17655780	FLORIANA
TRIQ JOHN LOPEZ	17655780	FLORIANA
TRIQ L-INDIPENDENZA	11734020	PIETA
PJAZZA SANT' ANNA	17655780	FLORIANA
TRIQ IL-MIRATUR	17655780	FLORIANA



PJAZZA SANT' ANNA	17655780	FLORIANA
TRIQ L-INDIPENDENZA	11734020	FLORIANA
TRIQ L-INDIPENDENZA	17655780	FLORIANA
TRIQ L-INDIPENDENZA	13135620	FLORIANA
TRIQ L-INDIPENDENZA	11734020	FLORIANA
TRIQ L-INDIPENDENZA	17655780	FLORIANA
TRIQ NAZZJONALI	23182975	FLORIANA
TRIQ NAZZJONALI	17655780	FLORIANA
TRIQ NAZZJONALI	23182975	FLORIANA
TRIQ NAZZJONALI	17655780	FLORIANA
TRIQ NAZZJONALI	17655780	FLORIANA
TRIQ NAZZJONALI	17655780	FLORIANA
TRIQ SA MAISON	11734020	PIETA
TRIQ IL-FOSS TA` NOTRE DAME	11734020	FLORIANA
TRIQ SANTA KATERINA	8091320	GHARGHUR
TRIQ SANTA KATERINA	8091320	GHARGHUR
TRIQ BIRZEBBUGA	8415440	GHAXAQ
TRIQ IL-BELT VALLETTA	10532805	GHAXAQ
TRIQ TAL-BARRANI	10532805	GHAXAQ
TRIQ TAL-BARRANI	10532805	GHAXAQ
TRIQ TAL-BARRANI	10532805	GHAXAQ
TRIQ PAOLA	10532805	GHAXAQ
TRIQ TAL-BARRANI	10532805	GHAXAQ
TRIQ TAL-BARRANI	10532805	GHAXAQ
TRIQ BIR MIFTUH	6716091	GUDJA
DAWRET IL-GUDJA	8769855	GUDJA
DAWRET IL-GUDJA	8769855	GUDJA
DAWRET IL-GUDJA	13249865	LUQA
TRIQ BUR GLAT	6716091	GUDJA
TRIQ IL-GUDJA	21796340	LUQA
DAWRET IL-GUDJA	6830774	GUDJA
TRIQ BUR GLAT	6601406	GUDJA
TRIQ VIANI	8815115	GZIRA
TRIQ NAZJU ELLUL	7256473	GZIRA
TRIQ IX-XATT	9177560	GZIRA
TRIQ MIKIEL ANTON VASSALLI	18038908	GZIRA
TRIQ MIKIEL ANTON VASSALLI	28189680	SAN GWANN
TRIQ IX-XATT TA' TA' XBIEX	9177560	GZIRA
TRIQ DUN GORG PRECA	7300000	HAMRUN
TRIQ IS-SALIB TAL-MARSA	23182975	FLORIANA
TRIQ IS-SALIB TAL-MARSA	23182975	HAMRUN
HAMRUN BY-PASS	34237365	HAMRUN
HAMRUN BY-PASS	34606745	HAMRUN
HAMRUN BY-PASS	34606745	HAMRUN
HAMRUN BY-PASS	34452230	HAMRUN
MARSA - HAMRUN BY-PASS	34452230	HAMRUN
TRIQ NAZZJONALI	23182975	HAMRUN
TRIQ NAZZJONALI	28710170	MARSA

TRIQ IS-SALIB TAL-MARSA	23182975	HAMRUN
TRIQ IS-SALIB TAL-MARSA	28710170	HAMRUN
TRIQ NAZZJONALI	23182975	HAMRUN
TRIQ IS-SALIB TAL-MARSA	7300000	HAMRUN
TRIQ BLATA L-BAJDA (AREA)	28710170	HAMRUN
TRIQ L-INDIPENDENZA	11734020	HAMRUN
TRIQ NAZZJONALI	23182975	HAMRUN
TRIQ NAZZJONALI	23182975	FLORIANA
TRIQ TAL-BALAL	8091320	IKLIN
TRIQ TAL-BALAL	8091320	IKLIN
TRIQ TAL-BALAL	8091320	IKLIN
TRIQ TAL-BALAL	8091320	IKLIN
TRIQ TAL-BALAL	8188107	GHARGHUR
TRIQ ERIN SERRACINO INGLOTT	11618680	IKLIN
TRIQ GUZE' BONNICI	11618680	IKLIN
TRIQ HAL GHARGHUR	11618680	IKLIN
TRIQ ERIN SERRACINO INGLOTT	11618680	IKLIN
TRIQ CENSU BUGEJA	8561440	IKLIN
TRIQ L-INDUSTRIJA	7194150	KIRKOP
TRIQ L-INDUSTRIJA	7194150	KIRKOP
TRIQ L-INDUSTRIJA	7194515	KIRKOP
DAWRET IL-GUDJA	7194150	KIRKOP
DAWRET IL-GUDJA	7194150	KIRKOP
TRIQ IN-NAXXAR	8561440	LIJA
TRIQ AGOSTINO PORTELLI	8561440	NAXXAR
TRIQ IN-NAXXAR	11618680	LIJA
TRIQ IN-NAXXAR	8561440	LIJA
TRIQ IN-NAXXAR	11618680	LIJA
TRIQ IN-NAXXAR	8561440	NAXXAR
TRIQ IN-NAXXAR	8561440	LIJA
TA' GNIEN TUT	7482500	IKLIN
TA' GNIEN TUT	7482500	IKLIN
TA' GNIEN TUT	7482500	IKLIN
TA' GNIEN TUT	7482500	IKLIN
VJAL L-AVJAZZJONI	13249865	LUQA
VJAL L-AVJAZZJONI	13249865	LUQA
DAWRET IL-GUDJA	13249865	LUQA
DAWRET IL-GUDJA	7194150	LUQA
DAWRET IL-GUDJA	7194150	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ IL-VJOLIN HADRANI	8373100	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ IL-KUNSILL TA' L-EWROPA	21796340	LUQA
VJAL L-AVJAZZJONI	14432100	LUQA
TRIQ GIUSEPPE GARIBALDI	20191190	MARSA
VJAL L-AVJAZZJONI	14432100	LUQA
TRIQ HAL LUQA	8794574	PAOLA

TRIQ IL-KUNSILL TA' L-EWROPA	13249865	LUQA
TRIQ IL-KUNSILL TA' L-EWROPA	13249865	LUQA
TRIQ IL-KUNSILL TA' L-EWROPA	13249865	LUQA
TRIQ IL-KUNSILL TA' L-EWROPA	13249865	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ HAL LUQA	6073965	LUQA
TRIQ HAL LUQA	6073965	LUQA
DAWRET IL-GUDJA	7194150	LUQA
DAWRET IL-GUDJA	7194150	LUQA
DAWRET IL-GUDJA	7194150	LUQA
DAWRET IL-GUDJA	7194150	LUQA
SQAQ L-ISTALEL	34237365	MARSA
MARSA BY-PASS	34237365	MARSA
MARSA BY-PASS	34237365	MARSA
TRIQ IL-LABOUR	32512620	MARSA
MARSA SPORTS CLUB	32512620	MARSA
TRIQ DICEMBRU TLETTAX	33971890	MARSA
TRIQ ALDO MORO	33971890	MARSA
TRIQ DICEMBRU TLETTAX	28710170	MARSA
ALDO MORO ROUNDABOUT	33971890	MARSA
TRIQ IL-LABOUR	32512620	MARSA
TRIQ DICEMBRU TLETTAX	33971890	MARSA
TRIQ SAN TUMAS	28710170	MARSA
SUPER ONE ROAD	32512620	MARSA
QASAM INDUSTRIJALI	20191190	MARSA
MARSA BY-PASS	34237365	MARSA
TRIQ IL-LABOUR	42985685	MARSA
TRIQ IL-LABOUR	32512620	MARSA
TRIQ DICEMBRU TLETTAX	28710170	MARSA
TRIQ DICEMBRU TLETTAX	33971890	MARSA
TRIQ IL-LABOUR	12676085	PAOLA
TRIQ NERIK SACCO	34237365	MARSA
SUPER ONE ROAD	32512620	MARSA
RDC AREA	32512620	MARSA
TRIQ IL-LABOUR	32512620	MARSA
TRIQ SAN TUMAS	28710170	MARSA
TRIQ TA' L-INFETTI	7896045	RABAT (Malta)
TRIQ TA' L-INFETTI	12455990	MDINA
VJAL L-ISTADIUM NAZZJONALI	12455990	MDINA
TELGHA TAS-SAQQAJJA	12455990	MDINA
TRIQ IL-MARFA	8710725	MELLIEHA
CARAVAN SITE	8710725	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
L-AHRAX	8710725	MELLIEHA

TRIQ IL-MARFA GHOLJA	8710725	MELLIEHA
MELLIEHA BY-PASS	11498471	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
CARAVAN SITE	8710725	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
TRIQ LOUIS WETTINGER	12987430	MELLIEHA
TRIQ LOUIS WETTINGER	12987430	MELLIEHA
TA' PENELLU BY-PASS	12987430	MELLIEHA
ROUNDABOUT	15797445	MELLIEHA
TA' PENELLU BY-PASS	12987430	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
TA' PENELLU BY-PASS	12987430	MELLIEHA
TRIQ LOUIS WETTINGER	12987430	MELLIEHA
ROUNDABOUT	15797445	MELLIEHA
ROUNDABOUT	15797445	MELLIEHA
ROUNDABOUT	15797445	MELLIEHA
MELLIEHA BY-PASS	11498473	MELLIEHA
Roundabout	12987430	MELLIEHA
BAY HOTEL	8710725	MELLIEHA
TRIQ IL-KBIRA	7310950	MOSTA
TRIQ MISRAH GHONOQ	7391980	MOSTA
TRIQ MISRAH GHONOQ	7391980	MOSTA
SAN PAWL TAL-QLEJJA	7310950	MOSTA
SAN PAWL TAL-QLEJJA	7310950	MOSTA
SAN PAWL TAL-QLEJJA	7310950	MOSTA
SQAQ GRECH MIFSUD	8057141	MOSTA
TRIQ MISRAH GHONOQ	7391980	MOSTA
TRIQ IL-KBIRA	7310950	MOSTA
TRIQ ID-DISGHA TA' APRIL	7380665	MOSTA
TRIQ MISRAH GHONOQ	7391980	MOSTA
TRIQ IL-PARROCCA	7380665	MOSTA
TRIQ IL-PARROCCA	7380665	MOSTA
TRIQ TAL-QARES	7380665	MOSTA
TRIQ IL-KOSTITUZZJONI	7380665	MOSTA
TRIQ IL-KOSTITUZZJONI	7380665	MOSTA
TRIQ TAL-QARES	7380665	MOSTA
TRIQ IL-KOSTITUZZJONI	7380665	MOSTA
TRIQ IL-PARROCCA	7380665	MOSTA
TRIQ MISRAH GHONOQ	7391980	MOSTA
TRIQ IL-BELT VALLETTA	7194515	KIRKOP
TRIQ IL-MAKNA TAS-SERRAR	8815115	MSIDA
TRIQ QRAJTEN	14640515	PIETA
TRIQ L-IMHALLEF PAOLO DEBONO	28189680	MSIDA

TRIQ L-IMHALLEF PAOLO DEBONO	28189680	MSIDA
BIRKIRKARA BY-PASS	28189680	MSIDA
TRIQ REGJONALI	28189680	MSIDA
TRIQ REGJONALI	28189680	MSIDA
TRIQ REGJONALI	12969226	MSIDA
TRIQ REGJONALI	28189680	MSIDA
TRIQ IL WIED TA' L-IMSIDA	32404700	MSIDA
ANTSAT AREA	32404700	MSIDA
TRIQ REGJONALI	32404700	MSIDA
TRIQ IL WIED TA' L-IMSIDA	32404700	MSIDA
TRIQ IL WIED TA' L-IMSIDA	32404700	MSIDA
TRIQ IL WIED TA' L-IMSIDA	32404700	MSIDA
ANTSAT AREA	32404700	MSIDA
TRIQ REGJONALI	28189680	MSIDA
BIRKIRKARA BY-PASS	12969226	MSIDA
TRIQ REGJONALI	32404700	MSIDA
TRIQ IL-HARRUB	32404700	MSIDA
TRIQ DUN KARM	15679162	MSIDA
TRIQ DUN KARM	15679162	MSIDA
TRIQ SANT' ANDRIJA	10259290	MSIDA
TRIQ SAN GWANN TAL-GHORGHAR	15679162	MSIDA
BIRKIRKARA BY-PASS	12969226	MSIDA
BIRKIRKARA BY-PASS	12969226	MSIDA
BIRKIRKARA BY-PASS	12969226	MSIDA
MISRAH HAMSA TA' OTTUBRU	14640515	MSIDA
MISRAH GUZE ELLUL MERCER	14640515	MSIDA
MISRAH GUZE ELLUL MERCER	14640515	MSIDA
MISRAH GUZE ELLUL MERCER	14640515	MSIDA
MISRAH GUZE ELLUL MERCER	14640515	MSIDA
TRIQ REGJONALI	28189680	MSIDA
TRIQ REGJONALI	28189680	MSIDA
TRIQ REGJONALI	32404700	MSIDA
MISRAH HAMSA TA' OTTUBRU	14640515	MSIDA
TRIQ REGJONALI	32404700	MSIDA
TRIQ REGJONALI	32404700	MSIDA
BIRKIRKARA BY-PASS	12969226	MSIDA
TRIQ L-INZUL TAL-FRANCIZI	7040165	NADUR
TRIQ GHAJN QASAB	7040165	NADUR
TRIQ TA' HIDA	7040165	NADUR
TRIQ TA' HIDA	7040165	NADUR
TRIQ GREGORIO CARAFFA	7040165	NADUR
TRIQ IL-MAGHTAB	6050240	NAXXAR
TRIQ IL-LATMIJA	6570000	NAXXAR
T' ALLA W OMMU	6163407	NAXXAR
TRIQ IL-PORZJUNKULA	12219957	NAXXAR
TRIQ IL-BARRAKKI TAL-MELH	12219957	NAXXAR
TRIQ IS-SALINI	12219957	NAXXAR
TRIQ IS-SALINI	12219957	NAXXAR

T' ALLA W OMMU	7029900	NAXXAR
TRIQ IL-PARROCCA	6570000	NAXXAR
TRIQ IL-PROFS A. J. ARBERRY	6570000	NAXXAR
TRIQ IN-NUTAR MANUEL DEBONO	6861883	NAXXAR
PJAZZA TONI BAJJADA	6935000	NAXXAR
TRIQ JEAN HOUEL	6570000	NAXXAR
TRIQ SAN PAWL	6570000	NAXXAR
T' ALLA W OMMU	6163407	NAXXAR
TRIQ IL-PORZJUNKULA	12219957	NAXXAR
TRIQ IR-RIDOTT	12219957	NAXXAR
TRIQ MARGARET A. MURRAY	8188107	NAXXAR
TRIQ TAL-LABOUR	8561440	NAXXAR
TRIQ IR-RIDOTT	12219957	NAXXAR
TRIQ IR-RIDOTT	12219957	NAXXAR
TRIQ IR-RIDOTT	12219957	NAXXAR
TRIQ GUZEPPI AGIUS	8671670	PAOLA
ROUNDABOUT	14312015	TARXIEN
VJAL SIR PAUL BOFFA	42985685	PAOLA
TRIQ GIUSEPPE GARIBALDI	19406930	PAOLA
TRIQ KORDIN	13014539	PAOLA
ROUNDABOUT	12676085	PAOLA
VJAL SIR PAUL BOFFA	12676085	PAOLA
ROUNDABOUT	12676085	PAOLA
ROUNDABOUT	12676085	PAOLA
ROUNDABOUT TRIQ GARIBALDI	21796340	PAOLA
TRIQ ISQOF BUHAGIAR	10950000	PAOLA
ROUNDABOUT	14312015	SANTA LUCIJA
KPH PARKING	32512620	MARSA
TRIQ HAL LUQA	8629604	LUQA
VJAL SIR PAUL BOFFA	42985685	PAOLA
ROUNDABOUT TRIQ GARIBALDI	21796340	LUQA
VJAL SIR PAUL BOFFA	32512620	PAOLA
ROUNDABOUT	42985685	PAOLA
ROUNDABOUT	42985685	PAOLA
TRIQ SANT' ANDRIJA	12219957	SWIEQI
TRIQ TOBRUK	12081743	PEMBROKE
TRIQ ARNHEM	12081743	SWIEQI
TRIQ NORMANDY	13309360	SWIEQI
TRIQ IX-XATT	14640515	PIETA
TRIQ W. BONNICI	11734020	PIETA
TORPEDO DEPOT GNIEN	14640515	PIETA
TELGHET GWARDAMANGA	14640515	PIETA
TRIQ HAL LUQA	6073965	QORMI
TRIQ IL-MITHNA	15496440	QORMI
TRIQ MANWEL DIMECH	8216880	QORMI
TRIQ SANTA KATARINA	10313805	QORMI
TRIQ IT-TIGRIJA	8216880	QORMI
TRIQ IS-SEBH	15496594	QORMI

TRIQ MANWEL DIMECH	6073965	QORMI
TRIQ TAL-HANDAQ	10313805	QORMI
TRIQ IL-MITHNA	14287221	QORMI
TRIQ HAL LUQA	6073965	QORMI
TRIQ TAL HANDAQ	10313805	QORMI
TRIQ NIKOL MONTEBELLO	10313805	QORMI
TRIQ L IMDINA	8060660	QORMI
TRIQ NIKOL MONTEBELLO	10313805	QORMI
TRIQ NIKOL MONTEBELLO	10313805	QORMI
TRIQ L-ISKULTUR	8948705	QORMI
MRIEHEL BY-PASS	14287219	QORMI
TRIQ IL-GOJJIN	15496593	QORMI
TRIQ IL-MITHNA	14287221	QORMI
TRIQ RICCARDA FARRUGIA	25503280	QORMI
TRIQ IL-GOJJIN	25503280	QORMI
MRIEHEL BY-PASS	14287221	QORMI
TRIQ IS-SEBH	15496594	QORMI
TRIQ L IMDINA	8060660	QORMI
TRIQ SAN BARTOLOMEW	6073965	QORMI
TRIQ HAL LUQA	6073965	QORMI
TRIQ HAL LUQA	6073965	QORMI
TRIQ IL-HAMSA U GHOXRIN TA' MEJJU 1743	6073965	QORMI
TRIQ L-ISKULTUR	34606745	QORMI
TRIQ TAL HANDAQ	10313805	QORMI
TRIQ TAL HANDAQ	10313805	QORMI
TRIQ GUZE DUCA	10313805	QORMI
TRIQ ANTONIO MUSCAT FENECH	10313805	QORMI
TRIQ IL-KACCATUR	34606745	QORMI
TRIQ IS-SEBH	25503280	QORMI
TRIQ IS-SEBH	25503280	QORMI
TRIQ IL-BELT VALLETTA	7896045	MDINA
TRIQ L-IMGARR	6570000	RABAT (Victoria)
TRIQ L-IMGARR	6570000	RABAT (Victoria)
TRIQ L-IMGARR	6570000	RABAT (Victoria)
TRIQ SAN LEONARDU	6026515	RABAT (Victoria)
TRIQ FORTUNATO MIZZI	6026579	RABAT (Victoria)
TRIQ L-ARCISQOF PIETRU PACE	6026515	RABAT (Victoria)
TRIQ FORTUNATO MIZZI	6026515	RABAT (Victoria)
TRIQ FORTUNATO MIZZI	6026579	RABAT (Victoria)
TELGHET SAN GILJAN	6570000	SAN GILJAN
TREJQET GRENFELL	7107280	SAN GILJAN
IX-XATT TA' SPINOLA	7107280	SAN GILJAN
TRIQ L-IMRABAT	7578495	SAN GILJAN
IX-XATT TA' SPINOLA	7107280	SAN GILJAN
TREJQET ID-DRAGUNARA	10001365	SAN GILJAN
TELGHET SAN GILJAN	8427850	SAN GILJAN
TRIQ DIODORUS SICULUS	18038908	SAN GILJAN

TRIQ DIODORUS SICULUS	18038908	SAN GILJAN
TRIQ IL-MENSIJA	15914610	SAN GILJAN
TRIQ GIUSEPPE GRECH	7482500	SAN GWANN
TRIQ IN-NAXXAR	6852875	SAN GWANN
TRIQ GIUSEPPE GRECH	7482500	SAN GWANN
KAPPARA	28189680	GZIRA
KAPPARA	18038908	SAN GWANN
KAPPARA	28189680	SAN GWANN
TRIQ PIETRU PAWL BEZZINA	7482500	SAN GWANN
TRIQ BELLA VISTA	6852875	SAN GWANN
TRIQ IL-FUGASS	6848860	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	8505960	SAN PAWL IL-BAHAR
SQAQ TA' CAMPRA	7391980	MOSTA
MISTRA	15797445	MELLIEHA
MISTRA	15797445	MELLIEHA
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
XATT IL-PWALES	15797445	SAN PAWL IL-BAHAR
XATT IL-PWALES	15797445	SAN PAWL IL-BAHAR
TRIQ TAL-QARBUNI	16265495	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	16265495	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	8505960	SAN PAWL IL-BAHAR
MISTRA	15797445	MELLIEHA
XATT IL-PWALES	15797445	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	13028188	SAN PAWL IL-BAHAR
XATT IL-PWALES	15797445	SAN PAWL IL-BAHAR
XATT IL-PWALES	15797445	SAN PAWL IL-BAHAR
TRIQ TAL-QARBUNI	16265495	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	8505960	SAN PAWL IL-BAHAR
MISTRA	15797445	MELLIEHA
TELGHET IX-XEMXIJA	15797445	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TRIQ IL-PWALES	15797445	SAN PAWL IL-BAHAR
TRIQ TA' FJURI	16265495	SAN PAWL IL-BAHAR
TRIQ TA' FJURI	16265495	SAN PAWL IL-BAHAR
TRIQ IL-WILEG	13028188	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TELGHET IX-XEMXIJA	15797445	SAN PAWL IL-BAHAR
TELGHET IX-XEMXIJA	15797445	SAN PAWL IL-BAHAR
MISTRA	15797445	MELLIEHA
TELGHET IX-XEMXIJA	15797445	SAN PAWL IL-BAHAR
TRIQ IL-MOSTA	13028188	SAN PAWL IL-BAHAR
TELGHET IX-XEMXIJA	15797445	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TRIQ J.F. KENNEDY	13028188	SAN PAWL IL-BAHAR
TRIQ IL-FREJGATINA	6848860	SAN PAWL IL-BAHAR
TRIQ IL-WILEG	6848860	SAN PAWL IL-BAHAR



TRIQ IL-WILEG	6848860	SAN PAWL IL-BAHAR
TRIQ IL-WILEG	6848860	SAN PAWL IL-BAHAR
TRIQ IL-WILEG	6848860	SAN PAWL IL-BAHAR
TRIQ IL-KBIRA SAN GUZEPP	8644295	SANTA VENERA
SANTA VENERA BY PASS	8644295	SANTA VENERA
TRIQ IL-KBIRA SAN GUZEPP	8644295	SANTA VENERA
TRIQ IL-WARD	6029185	SANTA VENERA
TRIQ IS-SEBH	8948705	SANTA VENERA
TRIQ IL-KBIRA SAN GUZEPP	8644295	SANTA VENERA
TRIQ IS-SEBH	8948705	SANTA VENERA
TRIQ IL-FERROVIJA	32404700	SANTA VENERA
TRIQ IL-FERROVIJA	32404700	SANTA VENERA
TRIQ IL-KAPPILLAN MIFSUD	33606645	SANTA VENERA
TRIQ REGJONALI	32404700	SANTA VENERA
TRIQ REGJONALI	32404700	SANTA VENERA
TRIQ IL-FERROVIJA	6029070	SANTA VENERA
TRIQ IS-SEBH	25503280	SANTA VENERA
TUNNEL	34452350	SANTA VENERA
TRIQ IL-KBIRA SAN GUZEPP	34452230	SANTA VENERA
TRIQ IL-HADDIED	34452230	SANTA VENERA
TRIQ MISRAH IL-BARRIERI	33606645	SANTA VENERA
TRIQ MISRAH IL-BARRIERI	33606645	SANTA VENERA
TRIQ REGJONALI	33606645	SANTA VENERA
TRIQ IL-FERROVIJA	6029070	SANTA VENERA
TRIQ REGJONALI	33606645	SANTA VENERA
TRIQ IL-KANUN	8644295	SANTA VENERA
TRIQ REGJONALI	33606645	SANTA VENERA
TRIQ REGJONALI	33606645	SANTA VENERA
TRIQ IL-FERROVIJA	6029070	SANTA VENERA
TUNNEL	34452230	SANTA VENERA
TRIQ IS-SEBH	34452230	SANTA VENERA
TRIQ GUZE FLORES	34452230	SANTA VENERA
TRIQ IT-TORRI	6752500	SAN GILJAN
TRIQ PARISIO	9177560	GZIRA
TRIQ IT-TORRI	7300000	SLIEMA
TRIQ GUZI FAVA	6507160	SLIEMA
TRIQ GUZI FAVA	6507160	SLIEMA
TRIQ TONNA	8427850	SLIEMA
PJAZZA SANT'ANNA	9177560	SLIEMA
PJAZZA SANT'ANNA	9177560	SLIEMA
PJAZZA SANT'ANNA	9177560	SLIEMA
TRIQ BISAZZA	9177560	SLIEMA
TRIQ BISAZZA	9177560	SLIEMA
TRIQ BISAZZA	9177560	SLIEMA
TRIQ AMERY	6507160	SLIEMA
TRIQ L-IMDINA SQAQ NRU. 1	12455990	ATTARD
TRIQ TAL-BARRANI SQAQ NRU. 2	10532805	ATTARD
TRIQ IL-PREKURSUR	12219957	SWIEQI

TRIQ JOSEF KALLEYA	15914610	SWIEQI
TRIQ SAN ANARD	7779245	TARXIEN
TRIQ SAN ANARD	7779245	TARXIEN
TRIQ IL-KONSTITUZJONI TRIQ GDIDA FI	7380665	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
LUQA EX-OFFICERS QUARTERS TWO SITE	8373100	LUQA
TRIQ L-IMGARR	6570000	XEWKIJA
TRIQ DUN GREZZ FARRUGIA	8104046	XEWKIJA
TRIQ L-IMGARR	6935000	XEWKIJA
TRIQ L-IMGARR	6935000	XEWKIJA
TRIQ L-IMGARR	9166039	XEWKIJA
TRIQ L-IMGARR	7042053	XEWKIJA
TRIQ TAL-LABOUR	12594325	ZABBAR
TRIQ IL-PONSJETTA	10186420	ZABBAR
TRIQ IL-PONSJETTA	10186420	FGURA
TRIQ ID-DEJMA	7779245	ZABBAR
TRIQ ID-DEJMA	7779245	ZABBAR
TRIQ TAL-LABOUR	12594325	ZABBAR
TRIQ TAL-LABOUR	12594325	ZABBAR
TRIQ TAL-LABOUR	12594325	ZABBAR
TRIQ TAL-LABOUR	10499590	ZABBAR
TRIQ TA' LHUDI	8060660	ZEBBUG (Malta)
TRIQ IT-TIGRIJA	12455990	ZEBBUG (Malta)
TRIQ TA' LHUDI	7896045	ZEBBUG (Malta)
TRIQ TA' BERT	8060660	ZEBBUG (Malta)
TRIQ L IMDINA	8060660	ZEBBUG (Malta)
SAPPHIRE SUITE	8060660	ZEBBUG (Malta)
TRIQ TA' L-IMGHAZEL	8060660	ZEBBUG (Malta)
TRIQ TA' LHUDI	8060660	ZEBBUG (Malta)
SAPPHIRE SUITE	8060660	ZEBBUG (Malta)
SAPPHIRE SUITE	8060660	ZEBBUG (Malta)
TRIQ H'ATTARD	8060660	ZEBBUG (Malta)
SQAQ IL-QENC	8060660	ZEBBUG (Malta)
TRIQ L IMDINA	8060660	ZEBBUG (Malta)
SQAQ IL-QENC	8060660	ZEBBUG (Malta)
TRIQ L IMDINA	8060660	ZEBBUG (Malta)
TRIQ L IMDINA	8060660	ZEBBUG (Malta)
TRIQ L IMDINA	8060660	ZEBBUG (Malta)
SAPPHIRE SUITE	8060660	ZEBBUG (Malta)
SQAQ IL-QENC	8060660	ZEBBUG (Malta)

TRIQ H'ATTARD	8060660	ZEBBUG (Malta)
TRIQ H'ATTARD	8060660	ZEBBUG (Malta)
TRIQ SANTA MARIJA	8060660	ZEBBUG (Malta)
TRIQ GHAR DALAM	8415440	ZEJTUN
TRIQ TAL-BARRANI	10532805	ZEJTUN
TRIQ IL-PRESIDENT ANTON BUTTIGIEG	8415440	GHAXAQ
TRIQ ID-DEJMA	7779245	ZEJTUN
TRIQ IL-PRESIDENT ANTON BUTTIGIEG	8415440	ZEJTUN
TRIQ SAN ANARD	7779245	ZEJTUN
TRIQ SAN ANARD	7779245	ZEJTUN
TRIQ IL-PRESIDENT ANTON BUTTIGIEG	10532805	ZEJTUN
TRIQ TAL-BARRANI	10532805	ZEJTUN

**Table 8: Major Roads**