



Performance Audit

Vehicle Emissions Control Schemes

Follow-up

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List of Abbreviations

AQP	Air Quality Plan
CBD	Common Database
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
EAC	Emission Alert Campaign
EU	European Union
IT	Information Technology
LGV	Light Goods Vehicle
LTD	Licensing and Testing Directorate
MEPA	Malta Environment and Planning Authority
MITA	Malta Information Technology Agency
MRA	Malta Resources Authority
NAO	National Audit Office
NMVOG	Non-Methane Volatile Organic Compounds
NO ₂	Nitrogen Dioxide
NSO	National Statistics Office
RET	Roadside Emissions Test
RTI	Roadside Technical Inspection
SMS	Short Message Service
SO ₂	Sulphur Dioxide
TM	Transport Malta
VECS	Vehicle Emissions Control Schemes
VERA	Vehicle Registration Administration
VIU	Vehicle Inspectorate Unit
VOSA	Vehicle and Operator Services Agency
VRT	Vehicle Roadworthiness Test



Executive Summary

Executive Summary

Introduction

1. The main aim of this follow-up performance audit is to determine the extent to which the findings and recommendations proposed in the performance audit report: Vehicle Emissions Control Schemes published in July 2009, hereafter referred to as the 'VECS Audit Report (2009)', have been addressed. This study aims to report on the progress registered in the reduction of vehicle emissions through various control mechanisms employed by Transport Malta (TM), namely the mandatory Vehicle Roadworthiness Test (VRT), the Emission Alert Campaign (EAC), and the surprise Roadside Technical Inspection (RTI).

2. This follow-up audit was carried out during the period January to May 2012 and based its findings and conclusions on data and information available as at the end of May 2012. For the purpose of this follow-up study, the National Audit Office (NAO) retained the objectives from its 2009 Report, and sought to:

- Evaluate the proper conduct and effectiveness of the vehicle emissions control schemes;
- Assess the proper implementation of the schemes through the quality control carried out by the regulatory bodies concerned;
- Review the proper and consistent enforcement actions contemplated by these schemes, so as to ensure that vehicles found to have excessive emissions, rectify their situation.

3. In order to illustrate the progress attained by TM since the publication of the 'VECS Audit Report (2009)', this Executive Summary reproduces the key recommendations proposed therein as marginal notes in green text. These recommendations addressed the strategic and operational aspects of the vehicle emissions control framework as well as issues specific to particular schemes. The degree of progress by TM registered in connection with these recommendations is presented adjacent to the proposals.

Strategic and operational issues common to all vehicle emissions control schemes

4. The effective management of vehicle emissions control schemes necessitates, that at the strategic level, individual measures compliment and support each other. This follow-up audit established that since the publication of the 'VECS Audit Report (2009)', various scheme specific efforts have been undertaken to strengthen the vehicle emissions control framework.

A review of all the vehicle emissions control schemes be undertaken so as to formulate more effective and efficient schemes.

The various vehicle emissions control schemes need to be equipped with real time, integrated data management applications to enable good data analysis, monitoring, and effective enforcement.

5. The mission statement of the Land Transport Directorate within TM includes the provision of an effective regulatory framework for land transport with road safety as a top priority, whilst at the same time promoting socio-economic development and protection of the environment. The strategy being adopted by TM is a balance between the establishment of standards, educating the public, and enforcement. (Section 1.5.1)

6. For this purpose, TM has or is in the process of implementing various schemes. These include aspects of eco-driving in driver training and testing, ascertaining that the public is aware of the importance of vehicle emissions testing, ensuring that VRT requirements are in line with EU Directives, maintaining a presence on the roadside with regular roadside checks and the supporting of fiscal measures that are aimed at improving the cleanliness of vehicles on the road, like registration tax and the scrappage scheme. (Section 1.5.2)

7. However, to date, the vehicle emissions control schemes are still not adequately feeding and appropriately complementing each other in terms of targeting and enforcement action. Furthermore, the compilation of policies relating to further educating and incentivising owners to undertake regular vehicle maintenance, as was proposed by the NAO in 2009, have not yet fully materialised. Transport Malta contends that budgetary constraints limited further progress in this regard. (Section 3.8.4)

8. Since the 'VECS Audit Report (2009)', TM is individually managing the various vehicle emissions control schemes through readily-available software. Although an Expression of Interest regarding a customised Information Technology (IT) enforcement system was drafted, lack of funds prohibited the Authority from making further progress towards this end. Consequently, a real-time, integrated data management system that would facilitate the planning and coordination of the various vehicle emissions control initiatives, is still not available to TM. (Sections 3.4.4 and 3.9.2)

9. In view of such circumstances, and notwithstanding the benefits reaped, lengthy periods of more than six months, regarding the reporting, processing, calling and emissions testing of potentially non-compliant vehicles at TM's facilities continue to materialise. Furthermore, the inability to process in real-time vehicle emissions test results, significantly dilutes the impact of TM's enforcement action. For example, an average of around three months elapsed before TM was able to impose a restriction on the renewal of the vehicle's annual circulation license, in cases where vehicles were found to be non-compliant. Such a situation implies that potentially defaulting vehicles may not be promptly repaired or prevented from circulating on the road for more than is practically reasonable to the detriment of Malta's ambience air quality. (Sections 3.7.6, 3.7.7, 3.6.5, and 3.9.1)

Emissions testing in the Vehicle Roadworthiness Test

10. This follow-up audit evaluated the mechanisms in place to ensure that emissions testing during VRTs are carried out properly by VRT station operators. Such mechanisms mainly involve that through various inspections, TM ascertains that VRT station operators are adhering to stipulated testing procedures.

Transport Malta is to routinely analyse the VRT results. This will enable the Authority to identify, investigate and act on abnormal trends in VRT results with respect to individual stations and/or specific vehicle categories.

The improved inspection regime of VRT stations, as adopted in 2008, needs to be sustained and the necessary timely follow-up undertaken in cases of infringements.

11. Since the 'VECS Audit Report (2009)', TM has sought to analyse VRT results on a monthly basis. Transport Malta utilised such analysis to enable it to better identify potentially 'high-risk' VRT stations, and consequently target enforcement initiatives and actions. (Section 2.7.2)

12. Transport Malta's personnel from its Technical Department aim to allocate VRT stations inspection priority in accordance with various criteria and indicators emanating from its analysis of VRT results. Despite the ensuing inspections, since the 'VECS Audit Report (2009)', the standard deviation of emissions tests failure rates among VRT station operators increased, as did the overall VRT failure rate. (Sections 2.6 and 2.5)

13. Since the 'VECS Audit Report (2009)', TM has increased the number and type of inspections targeted at VRT stations. This inspection regime includes the retesting of vehicles at TM's facilities (Post-VRT Checks) as well as surprise Spot Checks and Full Day Inspections at VRT stations. Moreover, VRT station operators are also obliged to photograph vehicles during VRTs. The number of inspections carried out annually was in accordance with TM's predetermined targets. (Section 2.3)

14. Post-VRT Checks are carried out through a risk-based approach, which takes into consideration various factors. The high overall pass rates of Post-VRT Checks emphasises the combined positive effect of TM's enforcement mechanisms, which ultimately resulted in VRT stations detecting a higher number of polluting vehicles. However, when individually evaluated, it transpired that some of TM's enforcement mechanisms were more effective than others at identifying shortcomings in VRT testing practice. (Sections 2.3.8 and 2.3.12)

15. In 2011, through the retesting of 1,224 vehicles, in Post-VRT Checks, TM detected 12 irregularities. Similarly, the 18 Full Day Inspections at 12 VRT stations revealed only three minor infringements. On the other hand, surprise Spot Checks was the mechanism which detected 10 irregularities through the 75 inspections carried out. (Section 2.3)

16. Since 2010, these enforcement measures resulted in a total of approximately €57,014 fines imposed on defaulting VRT stations by TM. However, due to the lengthy appeals system, which is independent of TM, as regulated by the Administrative Justice Act

(CAP. 490.), around 39 per cent (€22,215) of these fines are still outstanding. (Section 2.3.2)

Transport Malta is to ensure that comprehensive documentation relating to quality control inspections of VRT stations is maintained.

17. This follow-up audit revealed a significant improvement in the maintenance of inspection related records by TM since the publication of the 'VECS Audit Report (2009)'. Records pertaining to inspections and reviews undertaken by personnel from TM's Technical Department, namely, Post-VRT Checks, Spot Checks, Full Day Inspections and the photographing of vehicles during the VRT, are generally appropriately maintained. Such records provide an adequate audit trail of inspections and reviews carried out. However, the audit trail does not fully document TM's inspection targeting, which is primarily based on the risk classification of VRT stations as well as a random inspection schedule. In this regard, a more robust audit trail, is considered to be of critical importance to the effective regulation of a market-driven industry. (Sections 2.4 and 2.8.2)

The Emission Alert Campaign

18. The primary objectives of the Emission Alert Campaign (EAC) included increasing public awareness on the negative impact of harmful vehicle emissions, and in parallel, increasing the enforcement on vehicle emissions through the involvement of the general public. The EAC urged the public to report, via a mobile phone text message, the registration number of vehicles which they perceive as emitting noxious exhaust fumes. According to TM's follow-up procedures, those vehicles which get reported at least three times by three different mobile phone numbers within a three month period, would be summoned for an emissions test at TM's facilities.

The Campaign's operational strategy is to be reviewed in the light of the public's response to the initiative and of the resources available to TM.

19. This follow-up audit revealed that the number of Short Message Service (SMS) reports received from the general public has decreased by around 74 per cent between 2008 and 2011. Moreover, the number of SMS reports received through different mobile phones, assumed to represent different persons, also declined by approximately 51 per cent from 2009 to 2011. (Sections 3.3.2 and 3.3.3)

20. Despite the decline in the public's participation in the EAC, this initiative forms a complimentary element within the vehicle emissions control framework. There were minimal policy changes relating to the EAC's objectives and operational framework since the 'VECS Audit Report (2009)'. Transport Malta's initiatives in this regard extended to the development of an Expression of Interest to automate its operations related to the EAC through a customized IT enforcement system. However, these efforts were not followed through since the required funds were not available to the Authority. (Sections 3.4.1, 3.4.2 and 3.4.4)

Consideration for testing should start from the date a vehicle is reported for the first time through SMS.

21. Although TM is identifying those vehicles which have reached the SMS report threshold within the three consecutive month time-window, it is processing the mobile phone text messages received at fixed intervals every quarter. By not

processing SMS reports, at least on a monthly basis, TM would have forfeited the opportunity to take the appropriate action on those vehicles which have reached the report threshold at the earliest opportunity. Consequently, a maximum delay of two months results when a vehicle reaches its reports threshold before TM's processing date. Transport Malta contends that such processing times are not reducing the effectiveness of the EAC, since ultimately potentially non-compliant vehicles are summoned for emissions testing. Nevertheless, the Authority noted that it will continue to identify areas for potential improvement. (Sections 3.7.6 and 3.7.8)

22. Further processing time of around four months materialise in summoning vehicles for an EAC test at TM's facilities after they would have reached the SMS report threshold. Towards this end, this follow-up audit revealed that 78 out of 86 vehicles called for an EAC test on 19 August 2011 had reached their report threshold during the period January to March 2011. Such delay may be attributed to the fact that TM reduced the number of EAC tests carried out from an average of 241 monthly in 2009 to approximately 11 monthly in 2011. These circumstances materialised due to TM's other priorities, namely those relating to the reform of public transport. (Section 3.7.7)

23. Matters are further complicated since a substantial number of owners do not subject their vehicle for an EAC test in accordance with TM's request. This follow-up audit revealed that in 2011, there were 274 'no shows', involving 160 vehicles, out of the 252 vehicles summoned for an EAC test through the 411 EAC test notices issued. (Sections 3.6.1 and 3.6.4)

24. From the 252 vehicles summoned for an EAC test during 2011, a random sample of 60 out of the 160 vehicles that did not show-up following the receipt of one or more EAC test notices was analysed by the NAO. A review of these 60 vehicles showed that a restriction on the vehicles annual circulation license was imposed in 79 per cent of cases after the second consecutive 'no show'. Transport Malta noted this observation and shall be ensuring that procedures are consistently applied. (Section 3.6.4)

The publicity component of the EAC should be revived and particularly aim to educate owners about the vehicle maintenance they should undertake to ensure emissions compliance.

25. Transport Malta's publicity component of the EAC entails that vehicle owners are reminded about the SMS number on every road licence that is printed, a banner on the TM website which encourages people to send SMS reports and some adverts are issued to remind people about the scheme. Notwithstanding these efforts, public response declined. In part, such a decline may be attributed to a decrease in SMS reports received in relation to former public transport buses and the overall improvement registered in air quality. (Section 3.8.1)

26. Public interest in this scheme was however, revived in early 2011 through an *ad hoc* publicity campaign. The positive effects of this publicity campaign remained effective for around six months where the number of SMS reports received increased from around 2,932 to 4,395. However, following this period, the number of reports received declined to the same level prior to the undertaking of TM's awareness raising programme. It is to be noted, that, contrary to the previous publicity initiatives undertaken, TM's 2011 awareness campaign did not seek to educate owners about the benefits of regular vehicle maintenance, especially with regards the prevention of excessive vehicle emissions. (Sections 3.8.2, 3.8.3 and 3.8.4)

Roadside Vehicle Emissions Test

27. Surprise roadside checks of vehicle emissions are of critical importance to ensure that vehicles are appropriately maintained at all times and not just prior to a VRT. Roadside Technical Inspections (RTIs) are carried out by the Enforcement Directorate within TM. Up to 2009, these inspections, which focus on all aspects of vehicle safety and maintenance, used to be complemented by Roadside Emissions Tests (RETs) which were commissioned by the Joint Committees of Local Councils and carried out by Local Wardens.

Roadside emissions tests are to be conducted on a more frequent basis, particularly targeting vehicles older than eight years, and the vehicle categories with a high failure rate in road-side tests or in VRT.

Consideration is to be given for the Roadside Emissions Test (RET) conducted as part of the Local Enforcement System to be restarted with an improved regulatory framework.

28. The number of roadside inspections, which also incorporate vehicle emissions testing, has been decreasing over the years. In fact, there has been a decline from a total of 3,165 to 1,979 roadside emissions tests carried out during the period under review by the 'VECS Audit Report (2009)' and 2011 respectively. (Section 4.3.4)

29. Most notably, the decrease materialised in the aftermath of the curtailment of RETs, which were carried out by Local Wardens up to early 2008. To date, no official studies have been carried out to ascertain whether the effects resulting from the curtailment of the RETs, which specifically targeted emissions, have been appropriately absorbed through the current RTI regime. It is to be noted that around half of the vehicles tested through RETs were found to be non-compliant. Such a hit-rate is substantially higher than the current RTI emissions hit-rate of less than 6.5 per cent. (Sections 4.3.5 and 4.3.6)

30. Despite the NAO's recommendation in the 'VECS Audit Report (2009)', RTI targeting is still highly dependant on the acumen of the Authority's enforcement officers. The Authority only provides general targeting guidelines to its enforcement officers. Such direction entails that enforcement officers focus on the older, poorly maintained and excessively emitting vehicles. (Sections 4.3.12 and 4.6.2)

Overall Conclusions

31. This follow-up audit determined that since the publication of the 'VECS Audit Report (2009)', a significant improvement in Malta's ambient air quality was registered. In part, such improvement is attributable to less pollution from vehicles' emissions. Towards this end, recently introduced regulatory and fiscal measures have contributed. However, the sustainable reduction of toxic emissions from vehicles is also highly dependant on various enforcement mechanisms, which are implemented through vehicle emissions control schemes, such as the VRT, EAC and RTI.

32. To varying degrees, scheme specific recommendations proposed in the NAO's publication of 2009 have been implemented. Among the most critical initiatives in this regard is a more rigorous enforcement regime over VRT station operators, which generally led to a higher detection rate of non-compliant vehicles. Despite the improved and broader controls in place there still exists significant variation in vehicle emissions testing failure rate by the various VRT station operators.

33. Although the audit trail has been strengthened, in accordance with NAO recommendations in 2009, the EAC is still subject to operational limitations, namely lengthy processing periods, which ultimately impinge on its enforcement effectiveness. In many cases, these circumstances lead to the continued utilization of potentially non-compliant vehicles for a substantial number of months.

34. Transport Malta has also increased its roadside testing coverage to encourage and ascertain that vehicles are properly maintained at all times. Such increased coverage, however, has not fully absorbed the lacuna, which materialised after the curtailment of RETs in 2008, which used to be carried out by Local Wardens. The curtailment of the latter also implies that currently, there is no specific roadside test focusing solely on emissions.

35. The foregoing suggests that the initiatives implemented since the 'VECS Audit Report (2009)' had mixed results. Although TM has increasingly adopted a risk-based approach to target its enforcement mechanisms, further improvements in this area would have enhanced the overall effectiveness of the initiatives undertaken.

36. In view of such circumstances and in accordance with recommendations proposed by the NAO in 2009, the opportunity still exists to further ensure that vehicle emissions control schemes are designed and implemented as part of a holistic and comprehensive strategy aimed at tackling excessive vehicle emissions. The effectiveness of such an approach would also be dependant on the compilation of policies relating to further educating owners to undertake regular vehicle maintenance, such as those envisaged to emanate from the eco-driving initiative.



Chapter 1

Introduction

Chapter 1 – Introduction

1.1 Follow-up

1.1.1 This follow-up performance audit, undertaken by the National Audit Office (NAO), aims to report on the progress registered in the reduction of vehicle emissions, thereby improving Malta's ambient air quality. The main aim of this study is to ensure that findings and recommendations, in the performance audit report: *Vehicle Emissions Control Schemes* published in July 2009, hereafter referred to as 'VECS Audit Report (2009)', have been addressed.

1.1.2 The follow-up audit will also outline the various initiatives and measures undertaken by the Government in order to reduce vehicle emissions, which came into force after the publication of the 'VECS Audit Report (2009)', namely the Annual Circulation Tax, the Registration Tax, the Scrappage Scheme and the reform in Public Transport buses.

1.1.3 In order to obtain a clear picture of the improvement or otherwise since the 'VECS Audit Report (2009)', data pertaining primarily to the period 2009 to 2011 has been analysed. Unless otherwise stated, issues and conclusions presented during this follow-up audit reflect the information available as at the end of May 2012.

1.2 Situation as reported by NAO in July 2009

1.2.1 The 'VECS Audit Report (2009)' discussed the extent to which the implementation, monitoring and enforcement of Malta's vehicle emissions control schemes had the desired impact. Such

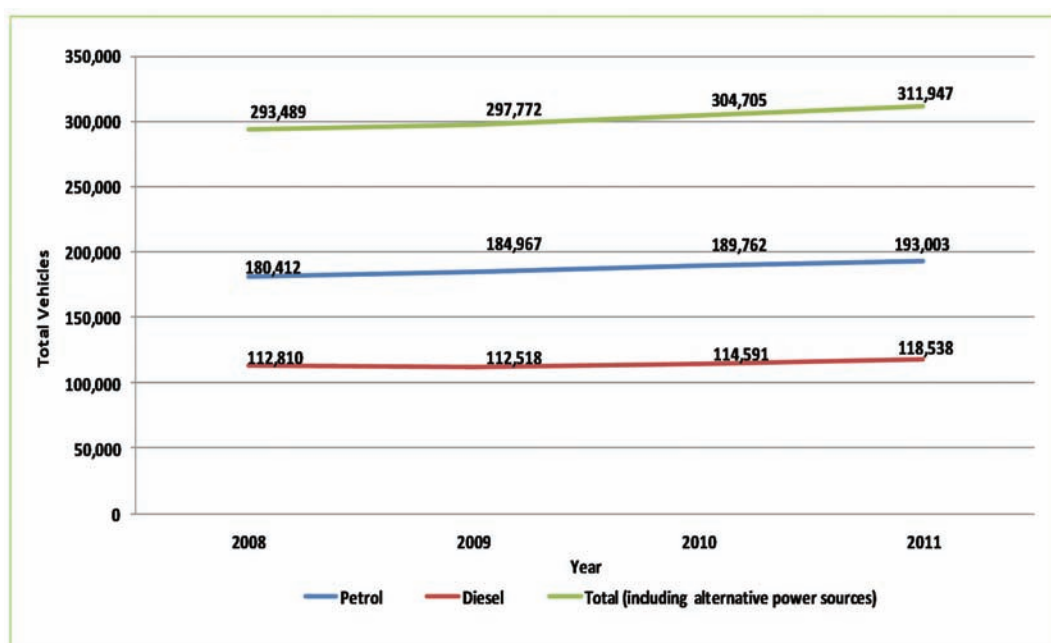
vehicle emissions control mechanisms include the following four schemes: the Vehicle Roadworthiness Test (VRT), the Emission Alert Campaign (EAC), the Roadside Technical Inspection (RTI) and the Roadside Emissions Test (RET). These schemes aimed to bring about greater compliance from owners to properly maintain their vehicles to ensure that emissions are within the levels prescribed by law.

1.2.2 The 2009 Report concluded that even though an improvement in vehicle emissions compliance had been recorded since the implementation of the schemes, further analysis showed that the schemes did not fully realise their potential.

1.2.3 Moreover, there was minimal effort to coordinate the planning, operational, enforcement and monitoring elements of the four schemes.

1.2.4 The lack of an integrated management information system also hindered effective management, rendered data analysis problematic, and resulted in incomplete audit trails.

1.2.5 In its 2009 Report, the NAO proposed recommendations aimed at strengthening Malta's emissions control framework, through various improvements at the strategic and operational levels. These included a review of all the schemes, aimed both at educating owners and at the same time devising emission control schemes which target the high-risk vehicles. With an appropriate data management application for each scheme, interlinked into a single data management system, the effective planning, monitoring and enforcement would be ensured.

Figure 1 : Total vehicles by engine type (2008 to 2011)

Source: NSO.

1.2.6 Other recommendations targeted the specific schemes. These will be better discussed in the following Chapters.

1.3 Vehicle Fleet Status

1.3.1 At the end of 2011, the stock of licensed motor vehicles stood at 311,947.¹ This implies that an overall increase of 24,827 vehicles has been registered since 2008. Figure 1 describes the changes in the total vehicle fleet since year 2008, for both petrol and diesel-engine vehicles.

1.3.2 Figure 2 depicts the total number of vehicles by age group. As at end 2011, Malta's average vehicle age was 13.86 years.² This is considered to be substantially higher when compared to the UK's average of seven years. Two major conclusions that can be drawn from Figure 2 are that the quantity of vehicles aged less than two years have decreased by 543 since 2008, while the higher age groups, from 15 years and over, are almost always on the increase. However, a decrease has been noticed for those vehicles aged 25 years and over, Figure 2 refers.

1.4 Current Emissions Levels

1.4.1 Air emissions are continuously being monitored by the Malta Environment and Planning Authority (MEPA) through the use of 144 diffusion tubes distributed all over Malta and Gozo, and another four real time monitoring stations located at Kordin, Floriana, Zejtun and Msida.

1.4.2 The latter monitoring station is located at a traffic site and, according to MEPA, provides a good indication of the type and volume of vehicle emissions. An increasing trend in Benzene traces has been recorded from the Msida monitoring station in recent years. Benzene, forming part of the Non-Methane Volatile Organic Compounds (NMVOC) as displayed in Figure 3, can only be attributed to petrol-engine vehicles. This increase may be accredited to various factors such as the increase in the total number of vehicles on the road, as noticed in Section 1.3, and/or even traffic congestions.

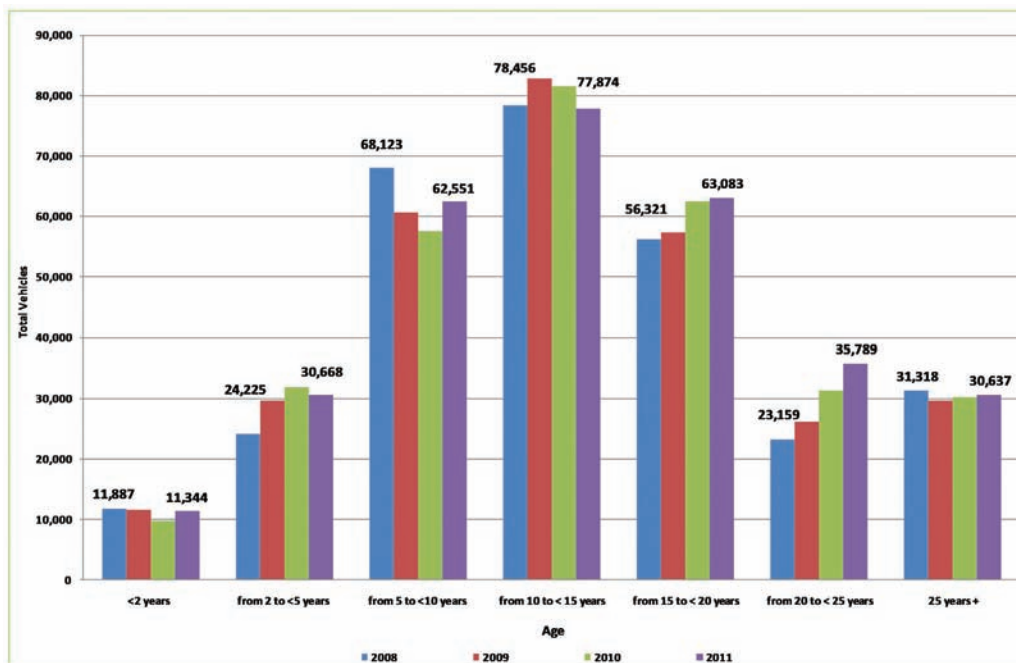
1.4.3 A considerable number of calculations are then carried out by MEPA officials in order to establish

¹ National Statistics Office–Malta, *News Release 1 February 2012 - Motor Vehicles: Q4/2011*, [online] Available at: http://www.nso.gov.mt/statdoc/document_file.aspx?id=3239 [Accessed 3 April 2012].

² Source National Statistics Office.



Figure 2 : Total vehicles by age (2008 to 2011)



Source: NSO.

those emissions, apart from benzene, pertaining to vehicle transport. A number of assumptions, even though constant over the years, are made in the process, namely:

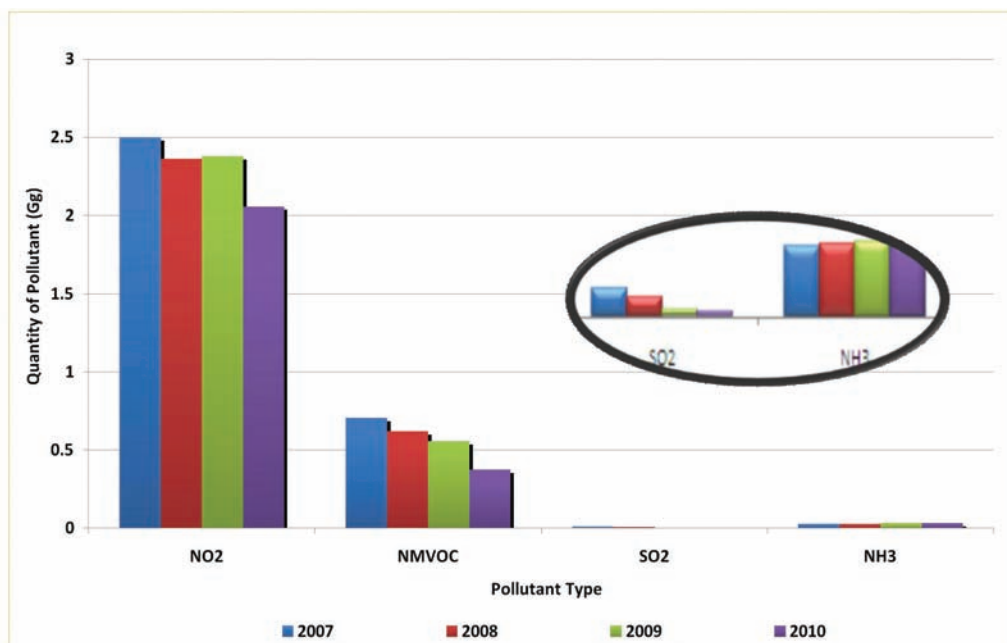
- Total consumption of fuel, as provided by the Malta Resources Authority (MRA), is allocated to land transport;
- Average mileage per vehicle was assumed from random Spot Checks done at VRT stations in the past;
- European Emission Standard³ was assumed in line with the year of manufacture of the vehicles concerned.

1.4.4 The emissions data collected through the diffusion tubes and the real time monitoring

³ European Emission Standard defines the acceptable limits for exhaust emissions of vehicles sold within the European Union (EU), ranging from 'Euro 1' to 'Euro 6', the latter having the most stringent requirements with respect to the fumes emitted from light passenger and commercial vehicles – Regulation (EC) No 715/2007.



Figure 3 : Quantity of pollutant, by type (2007 to 2010)



Source: MEPA.

stations is continuously recorded by MEPA and was summarised in Figure 3 for the period 2007 to 2010.⁴

1.4.5 From Figure 3 it is evident that there has been an overall reduction in vehicle emissions, resulting in a continuous improvement, particularly in minimising Nitrogen Dioxide (NO₂), NMVOC which include benzene from petrol-engine vehicles and Sulphur Dioxide (SO₂). Similar emissions data for 2011 will only be available at the end of year 2012, as indicated by MEPA officials.

1.5 Regulation of Land Transport

1.5.1 The mission statement of the Land Transport Directorate within Transport Malta (TM) includes the provision of an effective regulatory framework for land transport with road safety as a top priority, whilst at the same time promoting socio-economic development and protection of the environment. The strategy being adopted by TM is a balance between the establishment of standards, educating the public, and enforcement.

⁴ European Environment Agency, *Malta National Emission Inventory 2000-2009 and projections for 2010*, [online]. Available at: http://cdr.eionet.europa.eu/mt/eu/nec/envthgitg/MT_2000_2009_Inventory_and_projections_for_2010.XLS/manage_document [Accessed 3 April 2012].

1.5.2 For this purpose, TM has or is in the process of implementing various schemes. These include aspects of eco-driving in driver training and testing, ascertaining that the public is aware of the importance of vehicle emissions testing, ensuring that VRT requirements are in line with EU Directives, maintaining a presence on the roadside with regular roadside checks and the supporting of fiscal measures that are aimed at improving the cleanliness of vehicles on the road, like registration tax and the scrappage scheme.

1.6 Recently Introduced Vehicle Emissions Reduction Measures

1.6.1 Since the publishing of the 'VECS Audit Report (2009)', Government introduced various initiatives, including regulatory and fiscal measures, aimed at further reducing emissions from vehicles. However, the sustainability of these measures will, in the medium to long-term, be highly dependant on an effective vehicle emissions enforcement regime, namely the VRT, the Emission Alert Campaign (EAC) and surprise Roadside Technical Inspections (RTIs). To-date, there have been no official studies to accurately determine the impact of the recently introduced measures. These measures were not within the scope of this audit, nevertheless in some cases their impact is already apparent.

1.6.2 Since its introduction, in November 2010 until December 2011, over 2,400 vehicles which were older than ten years have been scrapped and replaced by a new and consequently less polluting vehicle. The scrappage scheme entails that a grant, up to a maximum of €2,000, is put forward to facilitate the purchase of the new vehicle, which must comply with 'Euro 5' emission standards. This implies that as a minimum, on average each new vehicle would emit around 10 per cent less CO₂ than the scrapped 10 year old vehicle.⁵ As at the end of April 2012, it is estimated that the cost of the grants awarded amounted to €4,504,476.⁶

1.6.3 A regulatory measure which obliges that the new bus service operates 'Euro 5' emission standard vehicles also had an immediate impact in reducing emissions from vehicles. These regulatory measures implied that a fleet comprising of buses with an average age of 35 years, and thus subject only to minimal emissions standards, was replaced with a fleet which complies to stringent emission levels.

1.6.4 The new vehicle registration taxation system, as introduced in January 2009, encourages the purchase of smaller vehicles, in other words vehicles that emit lower levels of pollutants, since the bigger and more polluting vehicles pay more registration tax than the previous system. This initiative was complemented by another fiscal measure reform, namely the annual circulation tax. The revamped regime aimed to stimulate the purchase of less polluting vehicles through the polluter-pays principle by basing the circulation tax on CO₂ and particulate matter emissions.

1.6.5 In addition to the recently introduced measures discussed above, in acknowledgment that road traffic is a major source of air pollution, the MEPA Air Quality Plan (AQP) of January 2010, sets a number of measures in order to achieve the following goals:

- Reduction in vehicle emissions;
- Encouraging a modal shift;
- Reducing the traffic impact of new developments.

1.6.6 The measures which have the highest impact *vis-à-vis* the aims of the plan, that is to curb ambient concentrations of certain pollutants, are those which will entail a reduction in traffic volumes. Currently, these measures are being subjected to further in-depth studies by MEPA.

⁵ Calculation is based on a 150g/km maximum CO₂ emissions stipulated by 'Euro 5' standards and an average of 167 g/km of CO₂ emissions for vehicles aged ten years as indicated in the document by the European Commission entitled: *Progress Report on Implementation of the Community's Integrated Approach to Reduce CO₂ Emissions from Light Duty Vehicles*.

⁶ Source: TM.

1.7 Focus of the follow-up audit

Audit Objectives

1.7.1 Against this background, the NAO undertook this follow-up audit to examine the improvements registered since the July 2009 publication. For the purpose of this audit, the NAO focused on the following objectives from the previous study, namely to:

- Evaluate the proper conduct and effectiveness of the vehicle emissions control schemes;
- Assess the proper implementation of these schemes through the quality control carried out by the regulatory bodies concerned;
- Review the proper and consistent enforcement actions contemplated by these schemes, so as to ensure that vehicles found to have excessive emissions, rectify their situation.

Audit Methodology

1.7.2 This report examined the extent to which the recommendations proposed in the 'VECS Audit Report (2009)' have been implemented. This entailed the review of key documentation including the local and EU legislative framework regulating the vehicle emissions control schemes. This enabled the NAO to determine the extent of adherence to the legal framework.

1.7.3 Records related to all the vehicle emissions control schemes were analysed. This data analysis enabled the determination of the overall contribution of these schemes towards the reduction

in vehicle emissions, and consequently the resulting improvement in the ambient air quality.

1.7.4 The NAO carried out interviews with the relevant officials at TM and MEPA. These interviews facilitated the evaluation of the degree to which the implementation of the above mentioned vehicle emissions control schemes was bearing the desired results.

1.8 Structure of the report

1.8.1 Following this introductory Chapter, the report is structured around these key areas:

- Chapter 2 evaluates the extent of developments regarding emissions testing in the VRT by TM. This Chapter discusses the degree of effectiveness of the various monitoring and control procedures adopted by TM.
- Chapter 3 discusses the present role of the EAC in increasing awareness of the negative impact brought about by vehicle emissions. This includes an evaluation of the relative monitoring and enforcement and the extent to which the Campaign is integrated with other vehicle emissions control schemes.
- Chapter 4 reviews the implementation of surprise roadside vehicle emissions tests, namely the RTI carried out by the Enforcement Directorate at the Vehicle Inspectorate Unit (VIU) within TM.

1.8.2 The overall conclusions emanating from this study are included in page 12 of this Report.



Chapter 2

Emissions testing in the Vehicle Roadworthiness Test

Chapter 2 – Emissions testing in the Vehicle Roadworthiness Test

2.1 Introduction

2.1.1 Chapter 2 focuses on the vehicle emissions tests carried out as part of the Vehicle Roadworthiness Test (VRT), predominantly on developments since the 'VECS Audit Report (2009)'. This part of the report evaluates the quality control carried out by Transport Malta (TM) to guarantee that the VRT emissions testing is carried out properly, resulting in an effective scheme and ensuring that on-the-road vehicles are compliant at all times.

2.1.2 The VRT started to be gradually introduced in Malta in October 1999. Currently such testing comprises about 20 aspects related to the overall roadworthiness condition of most vehicles aged four years and over. The following emissions-related testing became an obligatory component of the VRT in January 2002:

- Testing the exhaust gas opacity of diesel-engine vehicles, as this is considered to be an adequate indicator of a diesel-engine vehicle's state of maintenance with regard to emissions.
- Testing the Carbon Monoxide (CO) level of petrol-engine vehicles' exhaust.

2.1.3 The VRT also assesses the security and completeness of the exhaust system because any such defects are likely to lead to excessive emissions in the near future.

2.1.4 Additionally, the VRT also examines diesel-engine vehicles for the sealing of the high pressure fuel pump. Such a procedure is generally applicable to older vehicles. This check has been incorporated within the VRT since vehicle owners might break the pump seal, either due to maintenance or to adjust the engine performance, resulting in excessive emissions. Such tampering results in a VRT failure.

2.1.5 When a broken fuel pump seal has been identified, the vehicle owner is obliged to rectify the emissions levels and subsequently the VRT station installs a new enumerated seal supplied by TM. The VRT stations record the application of new seals into their online database managed by the Malta Information Technology Agency (MITA).

2.1.6 The vehicle owner is charged a variable amount for the service rendered by the VRT station. However, to date, a broken fuel pump seal is not considered to be an offence and the vehicle owner concerned is not liable to pay any fine or be subject to any penalty. Transport Malta has noted that it will be considering such an issue from a regulatory point of view.

2.1.7 The VRT may only be performed at testing stations run by operators who are granted a permit to do so by TM, after the necessary requirements stipulated in the VRT Regulations have been met.⁷ As at the end of 2011, there were 35 licensed active testing stations.⁸

⁷ VRT Regulations, Subsidiary Legislation 65.15.

⁸ Source: TM (during 2011 two VRT testing stations had closed down).

2.1.8 Every VRT station is required to have fully computerized test lanes equipped to test the gas opacity of diesel-engines and the carbon monoxide and hydrocarbon gas levels of petrol-engine exhaust emissions. Vehicle Roadworthiness Test stations must employ a minimum of one licensed qualified tester. The equipment must be calibrated regularly so as to ensure the validity of the measurements taken, up to the standard required by the VRT Regulations.

2.1.9 Vehicle Roadworthiness Test station operators have various record keeping and reporting obligations. The actual results of the vehicles tested are transmitted electronically to TM, updating TM's computerised vehicle database.

2.1.10 To ascertain that the VRT is being carried out properly and in line with the VRT Regulations, TM has been empowered by the latter to undertake various quality control measures. Transport Malta sought to undertake quality control through its Technical Unit, mainly by making unannounced Spot Checks and Full Day Inspections of the VRT stations.

2.1.11 Transport Malta's Technical Unit is composed of four officers, including a technical manager who is involved throughout all of the VRT monitoring and enforcement process, supported by an assistant technical manager, a technical officer and a clerk. Since 2010, TM has been sub-contracting the service of a security guard to attend random Spot Checks and Full Day Inspections, together with the technical officer from TM.

2.2 Situation as reported by the NAO in July 2009

2.2.1 The 'VECS Audit Report (2009)' concluded that TM is to routinely analyse the VRT results, enabling the identification of abnormal trends in VRT results with respect to individual stations or specific vehicle categories. At the time, this lack of analysis prohibited the implementation of a risk-based approach to enable TM to target its inspections at VRT stations.

2.2.2 Quality control was further constrained because inspection-related records for 20 of the VRT

stations were incomplete. Transport Malta was to ensure that comprehensive documentation should be maintained in order to strengthen the audit trail regarding these inspections.

2.2.3 Subsequent to the period under review in the 'VECS Audit Report (2009)'⁹, quality control of the VRT process improved significantly since TM embarked on various initiatives aimed at strengthening its monitoring and quality control functions. As a result of its stepped up monitoring, six VRT stations had been fined for VRT related infringements by TM. Despite such improvements, the 'VECS Audit Report (2009)' noted that VRT enforcement was still being constrained by a long drawn appeals process.

2.2.4 The VRT emission compliance effect was found to be short-lived. In fact, half the vehicles which were subjected to a roadside emissions test within a year of VRT certification, failed. This short-lived emissions compliance was attributed to the following factors, namely the lack of regular vehicle maintenance, on-the-road abuses by vehicle owners (such as fuel pump tampering) and the relatively old age of the Maltese vehicle fleet. The foregoing clearly indicated that vehicle roadworthiness cannot be ensured solely through VRT alone, but also needs to be complemented through regular on-the-road emissions testing.

2.2.5 In view of the conclusions reported in the 'VECS Audit Report (2009)', the National Audit Office (NAO) proposed the following main recommendations:

- Transport Malta is to routinely analyse the VRT results. This will enable the Authority to identify, investigate and act on abnormal trends in VRT results with respect to individual stations and/or specific vehicle categories.
- The improved inspection regime of VRT stations, as adopted in 2008, needs to be sustained and the necessary timely follow-up undertaken in cases of infringements.
- Transport Malta is to ensure that comprehensive documentation relating to quality control inspections of VRT

⁹ The period under review in the 'VECS Audit Report (2009)' refers between 1 October 2006 and 30 June 2007.

stations is maintained. The quality of such documentation will serve to strengthen the audit trail regarding these inspections.

2.2.6 The next sections of this Chapter discuss the extent to which these recommendations have been implemented by TM. A primary input towards implementing the NAO recommendations was the VRT Compliance Report compiled by the Land Transport Directorate, TM, in September 2010.

2.3 A more rigorous VRT stations monitoring and enforcement regime has been adopted

2.3.1 Subsequent to the conduct of the 'VECS Audit Report (2009)', TM adopted various initiatives to improve the monitoring and enforcement of VRT stations, namely Post-VRT Checks, Spot Checks, Full Day Inspections and the photographing of vehicles. A specific target was set by TM for every inspection measure and the respective achievements for 2010 and 2011 were recorded, Table 1 refers.

2.3.2 As indicated in Table 1, by the end of 2011, TM managed to meet and sometimes exceed most of the targets related to enforcement inspections at VRT stations. These enforcement measures resulted in a total of approximately €31,675 and €25,339 fines imposed on defaulting VRT stations by TM during 2010 and 2011 respectively. However, due to the lengthy appeals system, which is independent of TM, around 39 per cent (€22,215)¹⁰ of the above mentioned fines are still outstanding.

2.3.3 The ensuing sections further discuss the enforcement mechanisms outlined in Table 1.

The decrease in the number of irregularities detected during Post-VRT Checks is indicative of the effectiveness of such inspections

2.3.4 Post-VRT Checks entail that a vehicle is re-tested at TM's facilities within a week of being VRT certified. Such a test seeks to ensure that VRTs are properly undertaken by testing stations. In 2011, the

Table 1 : Inspection measures, targets and results (2010 and 2011)

Inspection Measure	Target	Results 2010	Results 2011
Post-VRT Checks (Vehicles are re-tested at TM's facilities within a week of being VRT certified)	1,000	978	1,224
		26 vehicles with irregularities	12 vehicles with irregularities
Spot Checks (Surprise checks by TM to ascertain that the prescribed roadworthiness test procedures are adhered to by the VRT station operators)	80 (each VRT station at least twice a year)	52	75
		Seven cases of irregularities identified	10 cases of irregularities identified
Full Day Inspections (Detailed verification of the VRT procedures to be followed by the VRT station operators)	14 (one per high-risk VRT station)	13	18
		No irregularities identified (the high-risk VRT stations had not yet been identified)	Three irregularities identified (two out of the 18 Full Day Inspections were carried out at the high-risk stations)
Photographing of Vehicles (During the VRT. Implemented in October 2010)	Five per cent sample check or more	810 photos verified (Five per cent of photos taken)	6,349 photos verified (Five per cent of photos taken)
		No irregularities identified	Three irregularities identified

Source: TM.

¹⁰ Source: TM.

number of Post-VRT Checks increased by 25 per cent over the previous year. Nonetheless, almost 54 per cent less irregularities were identified.

2.3.5 The decrease in the number of irregularities detected during Post-VRT Checks is indicative of the effectiveness of such inspections, which brought about improved performance and compliance to VRT regulations by testing stations. Moreover, such Post-VRT Checks have the added benefit that they encourage VRTs to be carried out more scrupulously since testing stations' owners would be aware that any certified vehicles can be called for re-testing by TM.

2.3.6 The number of Post-VRT Checks undertaken can be considered substantial, especially when considered against the number of irregularities detected by TM. In fact, in 2011 only 12 irregularities were detected with respect to the 1,224 vehicles inspected. Furthermore, only one of the 12 irregularities, identified through the Post-VRT Checks performed during 2011, was related to non-compliant vehicle emissions levels.

2.3.7 The 12 irregularities identified pertained to nine testing stations. In view of these irregularities, TM imposed fines totalling €7,150, amounting to around 28 per cent of the total fines imposed on testing stations regarding VRT irregularities in 2011. Additionally, VRT station operators are allocated penalty points, consequently leading to the revocation of the VRT station's license if a maximum number of points is reached within a specified period of time.

Around one seventh of surprise Spot Checks by TM at VRT stations revealed irregularities

2.3.8 Transport Malta also carried out surprise Spot Checks to ascertain that the prescribed roadworthiness test procedures were adhered to by VRT stations. The number of Spot Checks carried out has increased by 44 per cent in 2011 over the previous year. The hit-rate of these inspections, that is the number of irregularities identified, was around 13 per cent in the years under review. Such a hit-rate is significantly higher than that achieved through Post-VRT Checks.

2.3.9 Each VRT station was subjected from one to four surprise Spot Checks. Although TM regularly monitors VRT station performance in terms of test throughput, the targeting criteria adopted for these Spot Checks is not documented. Moreover, TM does not document the reasons for deviating from the inspection targeting criteria which stipulated that all testing stations were to be visited at least twice annually. This lack of documentation weakens the relative audit trails since it is not possible to correlate inspection targeting with the associated risk presented by specific testing stations.

2.3.10 During 2011, TM imposed a total of €12,920 fines on five defaulting VRT stations, identified through the surprise Spot Checks performed. It is pertinent to point out that nearly 90 per cent of these fines were imposed on one station for irregularities detected during one inspection.

Full Day Inspections by TM detected only minor infringements at VRT stations

2.3.11 Transport Malta's enforcement mechanisms also include Full Day Inspections at VRT stations. These inspections entail verification that the stipulated VRT procedures are being followed by testing stations. Full Day Inspections provide TM with the opportunity to monitor the work practices of individual testing stations over a number of hours. Such inspections are intended to be targeted at high-risk testing stations.

2.3.12 During 2011, TM carried out 18 Full Day Inspections at 12 testing stations. Each of these stations was monitored on up to three occasions. These inspections revealed only minor infringements with respect to VRT regulations, namely related to the photographing of vehicles during testing. The number and type of infringements detected imply a lower hit-rate than Spot Checks. It is to be noted that no irregularities were detected by TM through the 13 Full Day Inspections performed during 2010.

2.3.13 Such circumstances question the effectiveness of this enforcement mechanism. These concerns are based on the assumption that high-risk testing stations are being targeted and that TM adopts the same monitoring procedures as



those utilised during Spot Checks. In such a scenario it would be expected that, at least, the same rate of irregularities would result through both types of inspection. On the other hand, TM contends that the main aim of full day inspections is to monitor and ensure the quality of tests carried out by stations which carry out a high number of tests. This is done by comparing the number of tests carried out during the day when TM officers are present at the station with the number of tests carried out by that same station during the same day of a different week when TM officers are not present. Any material variances in the number of tests carried out on both dates are then followed up by additional spot checks at that particular station.

2.3.14 A contributory factor leading to the situation discussed in the preceding paragraph relates to limitations in TM's targeting of Full Day Inspections. Issues related to risk-based inspection targeting are discussed in paragraph 2.7.

The photographing of vehicles has significantly minimised the potential for abuse related to VRT certification

2.3.15 Another control mechanism which was implemented by TM to ensure that VRTs are appropriately carried out entail the photographing of vehicles during testing. This control is intended to provide further assurance that vehicles were actually certified at the respective testing station.

Vehicle Roadworthiness Test stations are obliged to electronically submit these photographs to TM in accordance with VRT Regulations as stipulated in Legal Notice 49 of 2012. It is to be noted, however, that TM piloted this initiative during 2010 and 2011.

2.3.16 In accordance with its own established targets, TM reviews at least five per cent of the photographs taken by every testing station. During 2011, the 6,349 photographs reviewed identified only three non-conformities.

2.4 Quality control inspection related records have improved significantly

2.4.1 This follow-up audit has revealed a significant improvement in the maintenance of inspection related records by TM since the publication of the 'VECS Audit Report (2009)'.

2.4.2 Records pertaining to inspections and reviews undertaken by TM officers, namely, Post-VRT Checks, Spot Checks, Full Day Inspections and the photographing of vehicles during the VRT, are generally appropriately maintained. Such records provide an adequate audit trail of inspections and reviews carried out.

2.4.3 However, as pointed out in paragraph 2.3.9, the audit trail does not extend to the targeting of testing stations with regard to the different inspection measures.



2.5 Emissions related VRT failures have doubled in 2011 over the previous year

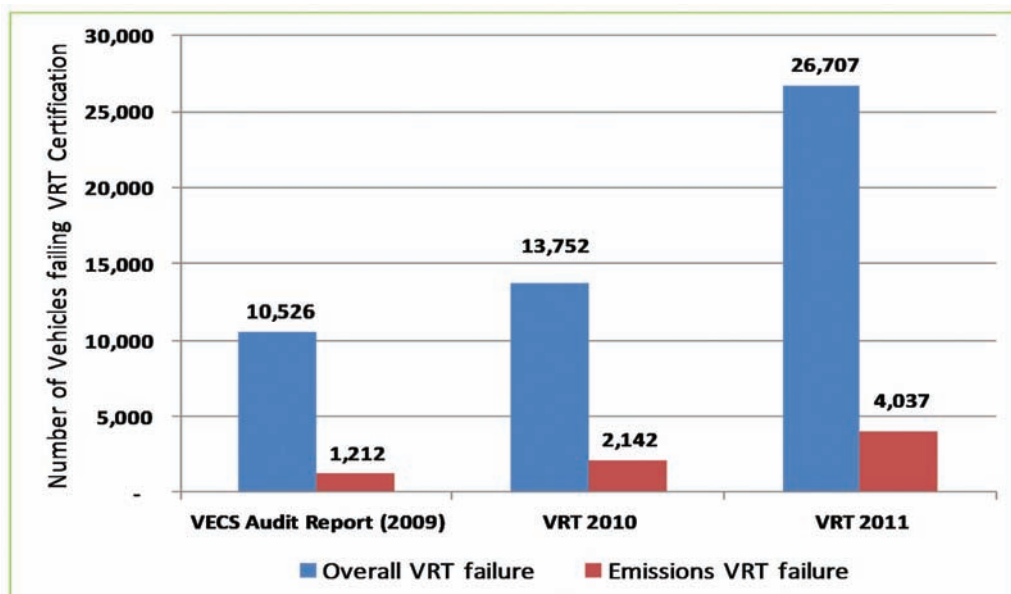
2.5.1 The enhanced inspection regime, brought about by the intensified enforcement actions undertaken by TM, resulted in a substantial increase in the VRT failure rate, both as regard the overall condition of the vehicles tested and also the emissions related failures, Figure 4 refers.

2.5.2 As evidenced in Figure 4, the emissions related VRT failures have almost doubled during

2011 over the previous year. This follows a similar trend when considering the overall VRT failures, such as brakes, lights, suspensions and other checks carried out during the VRT.

2.5.3 Transport Malta contends that the substantial increase in the VRT failures was primarily brought about by the intensified enforcement regime adopted since 2009. Furthermore, the Authority remarked that the increased enforcement resulted in over-cautious VRT station operators, preferring to fail a vehicle in border-line cases. Such occurrences particularly result when testing is based on visual

Figure 4 : VRT failure rate since the 'VECS Audit Report (2009)'



Source: TM.

checks. The over-cautious attitude adopted by some testing stations may have developed since VRT stations are liable to fines and also penalty points when infringements are detected by TM. It is to be noted that when the maximum penalty points are accumulated within a specified period, the VRT station’s license will be revoked.¹¹

2.5.4 Notwithstanding the overall improvements in VRT certification, substantial variation in testing stations’ failure rates, including those related to emissions, is still present.

2.6 Inconsistencies in VRT emissions failure rates at the various testing stations persist

2.6.1 The significant variation in VRT stations’ emissions failure rates, as previously highlighted in the ‘VECS Audit Report (2009)’, prevails. Such a situation resulted despite TM’s strengthening of its enforcement regime, Figure 5 refers.

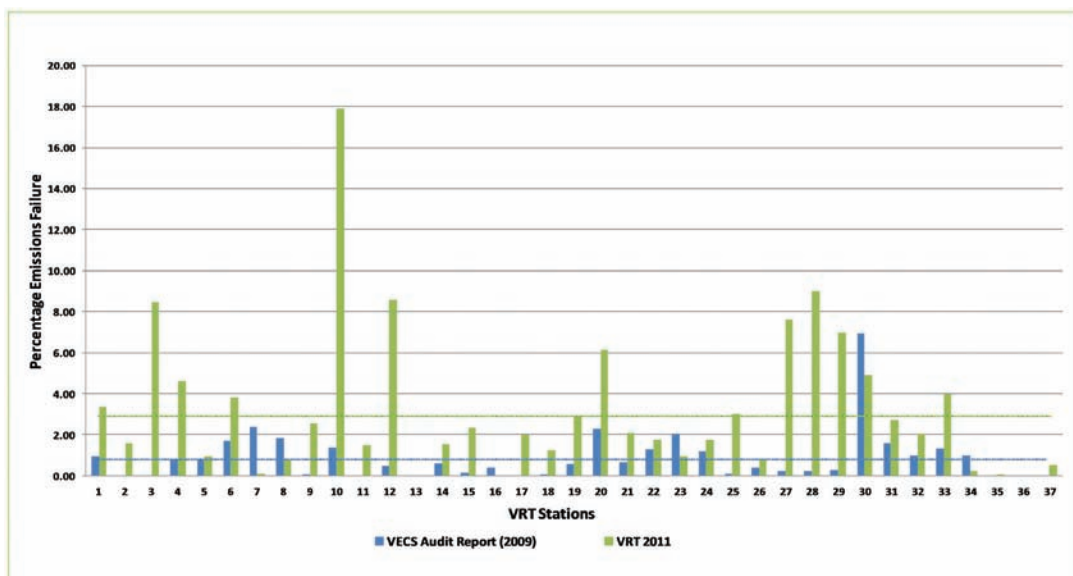
2.6.2 During October 2006 to June 2007, that is the period under review by the ‘VECS Audit Report (2009)’, the standard deviation was calculated at 1.24. As at end 2011, this value increased to 3.60. It is pertinent to note that the standard deviation pertaining to the overall VRT failure rate

also showed an increasing trend over the above mentioned periods. Although other variables, such as the number and vehicle mix tested influence these calculations, it is pertinent to note that over time, there have also been significant shifts in the failure rate of individual stations.

2.6.3 Transport Malta contends that various issues influence the resulting variation in emissions testing failure rates. These include the following:

- Selective VRT station operators tend to postpone emissions testing if it is perceived that a visibly polluting vehicle will fail to adhere to the stipulated standards. Such circumstances result in a lower VRT failure rate for the testing station.
- Vehicle Roadworthiness Test station operators may also adopt the practice indicated in the above paragraph to avoid losing any customers.
- Analysis of VRT emissions testing results may be subject to distortions since pre-1979 registered vehicles are subjected to a visual test, which is considered as highly subjective.

Figure 5 : Percentage emissions failure rate for all VRT stations during 2011, as compared with the period under review during the ‘VECS Audit Report (2009)’



Source: TM.

¹¹ VRT Regulations Subsidiary Legislation 65.15.

- Intensified enforcement by TM, coupled with the amount of accumulated penalty points and the relative risks associated with the revocation of the VRT operator licence, have led some testing stations to adopt an over-cautious attitude.

2.6.4 Transport Malta contends that it will further analyse the variation in the VRT emissions failure rate. Furthermore, TM noted that its analysis would consider the proportion of vehicle tested by individual station operators and the average age of the vehicles being tested.

2.7 Risk-based targeting of enforcement measures related to VRT station operators can be further improved

2.7.1 During the latter part of 2010, TM developed criteria to enable it to identify testing stations which posed a risk to the integrity of VRT certification. These criteria included VRT stations:

- which perform a high number of tests and whose failure rate is lower than the average by three percentage points or higher by five percentage points;
- whose failure rate is seven percentage points lower or ten percentage points higher than the average;
- which were the subject of three or more public complaints, as well as three or more infringements over the past three years as identified by TM.

2.7.2 At the outset, TM intended to utilise such criteria for its Full Day Inspection programmes for both 2010 and 2011. The profiles of 14 of the 37 testing stations fitted the above criteria. However, on the basis of experience accrued from inspections carried out in 2010, TM felt that, rather than being strictly bound by the criteria indicated in the preceding paragraph for its 2011 inspection programme, inspections would be more effective if it also took into consideration the results of a monthly

review of all VRT stations' performance. Transport Malta contended that this approach would render its targeting practices more effective since they would be based on the latest information available, including complaints received. In fact, TM only conducted two of the Full Day Inspections at the previously identified 14 testing stations, while on the other hand it carried out 16 Full Day Inspections on other stations that were not initially identified.

2.7.3 On comparing the results achieved from the Full Day Inspections carried out in 2011 with those carried out in 2010, it is evident that the utilisation of the latest criteria by TM proved to be more effective. However, to avoid potential subjectivity when prioritising inspections, TM is to document any additional criteria and their relative weighting, in the policy to be adopted when targeting inspections at VRT station operators.

2.8 Conclusion

2.8.1 Whilst acknowledging that TM's enforcement regime has made a positive impact towards further ensuring VRT integrity, there still exists some limitations in its inspection targeting practices. These limitations are considered to hinder TM from optimising the effectiveness through the various enforcement measures. In part, this is evidenced by the variation in VRT emissions failure rates of the various testing stations.

2.8.2 Although TM made substantial improvements since the 'VECS Audit Report (2009)' in maintaining enforcement related documentation, a weak audit trail relating to inspection targeting prevails. This documentation is of critical importance to the effective regulation of a market-driven industry.

2.8.3 The ensuing Chapters of this report will mainly evaluate any improvements in the other vehicle emissions control schemes, namely the Emission Alert Campaign and the Roadside Technical Inspection. Thus, the contribution to the control of vehicle emissions of these on-the-road emissions control schemes shall be verified in Chapters 3 and 4 respectively.



Chapter 3

The Emission Alert Campaign

Chapter 3 – The Emission Alert Campaign

3.1 Introduction

3.1.1 This Chapter discusses the Emission Alert Campaign (EAC). The Campaign was launched by Transport Malta (TM) in August 2005. The key objectives of the EAC include:

- increasing public awareness on the negative impact of harmful vehicle emissions;
- increasing enforcement through the involvement of the general public;
- reducing drastically vehicle emissions.¹²

3.1.2 The Campaign was also intended to induce Vehicle Roadworthiness Test (VRT) stations to act more responsibly when issuing VRT certificates. If a reported vehicle fails the EAC test after a recent VRT pass, then this would surely reflect negatively onto the VRT station concerned.¹³

3.1.3 To increase vehicles' emissions compliance, the EAC urged the public to report, via a mobile phone text message, the registration number of vehicles which they perceive as "emitting noxious exhaust fumes".¹⁴

3.1.4 According to TM's follow-up procedures, those vehicles which get reported at least three

times by three different mobile phone numbers within a three month period, would be summoned for an emissions test at TM's facilities. This filtering mechanism aims to ascertain that, as far as possible, non-compliant vehicles are identified. Moreover, this approach minimises the risk that owners of the tested vehicles would be victims of pranks or malicious reports.

3.1.5 Summoned vehicles would be subjected to the emissions components of the VRT, namely:

- checking of the exhaust system;
- testing the opacity of diesel-engine vehicles' exhaust;
- testing the carbon monoxide and hydrocarbon exhaust levels of petrol-engine vehicles.

3.1.6 If the vehicle fails the test, TM issues a Court summons where a fine of €46.59 could be imposed on the owner. Moreover, the vehicle owner would also be asked to rectify the matter and return for a subsequent emissions test within two weeks. If a vehicle fails the re-test or does not turn up for the test, after being summoned twice, TM would place a restriction on the vehicle's annual circulation license renewal.¹⁵ This implies that the vehicle owner will not be able to renew the vehicle road license once it

¹² Emissions Alert information leaflet issued by TM, Ministry for Infrastructure, Transport and Communications [previously known as the Malta Transport Authority (ADT), Ministry for Urban Development and Road].

¹³ Emission Awareness and Enforcement Project Brief issued by the PR/Executive Office of the Malta Transport Authority, page 3, 22 August 2005.

¹⁴ Emission Alert information notice issued by TM, Ministry for Infrastructure, Transport and Communications [previously known as the Malta Transport Authority (ADT), Ministry for Urban Development and Road].

¹⁵ Malta Transport Authority, Executive Office, Emission Awareness & Enforcement Project Brief, pages 3 to 4, August 2005.

is overdue, either that same year or the following in case it was recently renewed.

3.2 Situation as reported by the NAO in July 2009

3.2.1 The ‘VECS Audit Report (2009)’ concluded that, to varying extents, the Campaign was successful in attaining its objectives of creating awareness, bringing out enforcement and also at reducing vehicle emissions.

3.2.2 The Campaign was also effective in increasing public awareness about the health hazards and illegality of excessive fumes. This was particularly evident from the number of Short Message Service (SMS) reports received by TM. However, the EAC was not deemed to have managed to generate a preventive and proactive awareness, that is, consciousness about the simple maintenance measures that vehicle owners need to take in order to prevent excessive emissions.

3.2.3 With regard to the Campaign’s objectives of enforcing emissions standards and of reducing vehicle emissions, the Campaign made modest inroads, although less than its’ potential. The majority of license renewal restrictions, 84 per cent, were effective. The rest were rendered ineffective mostly because of the time lag in registering issued restrictions, while some other restrictions were either never registered, or ignored once registered.

3.2.4 Additionally, the potential of the Campaign was not fully realized largely because a significant number of reported vehicles which were eligible for testing were not summoned. The implementation of the EAC was not always consistent and transparent. In particular, the vehicles reported were not filtered regularly and the summoned vehicles did not always follow the Campaign’s publicised procedures. The failure to record the filtering dates constituted an incomplete audit trail and reduced the Campaign’s operational transparency.

3.2.5 In explanation of the above mentioned shortcomings, TM stated that enforcement was a secondary objective of the Campaign. Secondly it did not summon all vehicles eligible for testing because it lacked the necessary resources,

particularly the testing capabilities needed to cope with the significant public response. Transport Malta acknowledged the fact that an integrated automated data management system would have increased transparency and reduced transcription error risks, but deemed the costs to outweigh the potential benefits.

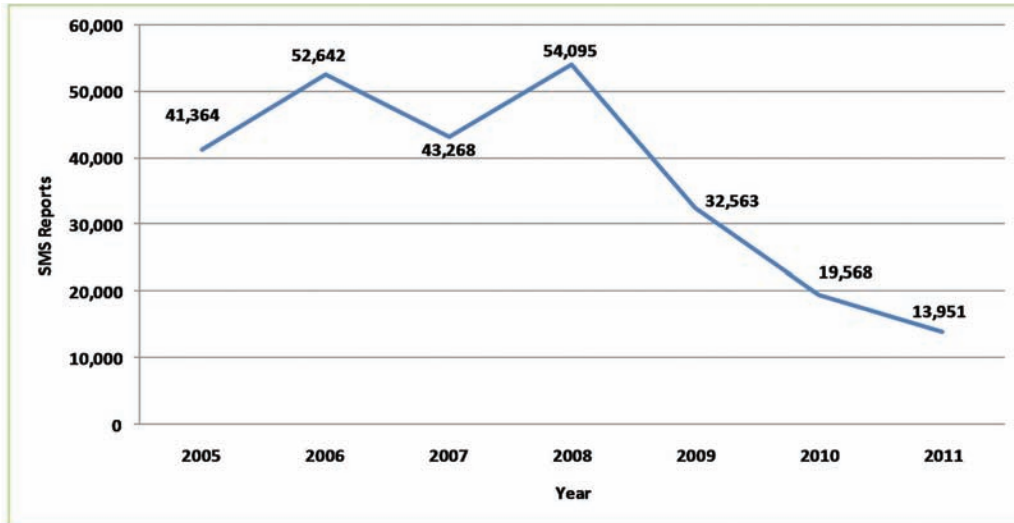
3.2.6 The Campaign was effective at identifying diesel-engine vehicles with excessive emissions. However, since the public is generally unable to assess the exhaust of petrol-engine vehicles, the Campaign cannot be regarded as a means of controlling emissions from petrol-engine vehicles. The latter would need to be targeted through other forms of vehicle emission control schemes.

3.2.7 Despite its limitations and shortcomings, the Campaign played a meaningful role in Malta’s efforts to curb excessive vehicle emissions. An adequately resourced and well planned Campaign has the potential to complement the VRT and roadside emissions test scheme.

3.2.8 In view of the conclusions reported in the ‘VECS Audit Report (2009)’, the NAO proposed the following main recommendations:

- The Campaign’s operational strategy is to be reviewed in the light of the public’s response to the initiative and of the resources – including testing capacity – available or to be provided to TM. An updated operational strategy should facilitate planning, implementation, enforcement, monitoring and improve the overall effectiveness of the Scheme.
- The filtering time period should start from the date a vehicle is reported for the first time. Such vehicle-centred filtering has various advantages over the current method of setting the same filtering period for all vehicles. It would link eligibility for testing more directly to a vehicle’s actual performance.
- The publicity component of the Campaign should be revived and particularly aimed to educate vehicle owners about the vehicle maintenance they should undertake to ensure emissions compliance.

Figure 6 : Total number of SMS reports received per year (2005 to 2011)



Source: TM.

3.2.9 The next sections of this Chapter discuss the extent to which these recommendations have been implemented by TM.

3.3 The Emission Alert Campaign registered a decline in public response

3.3.1 Since its launching in August 2005 up to the end of 2011, a total of 257,451 SMS reports were received. A yearly breakdown of the latter is illustrated in Figure 6.

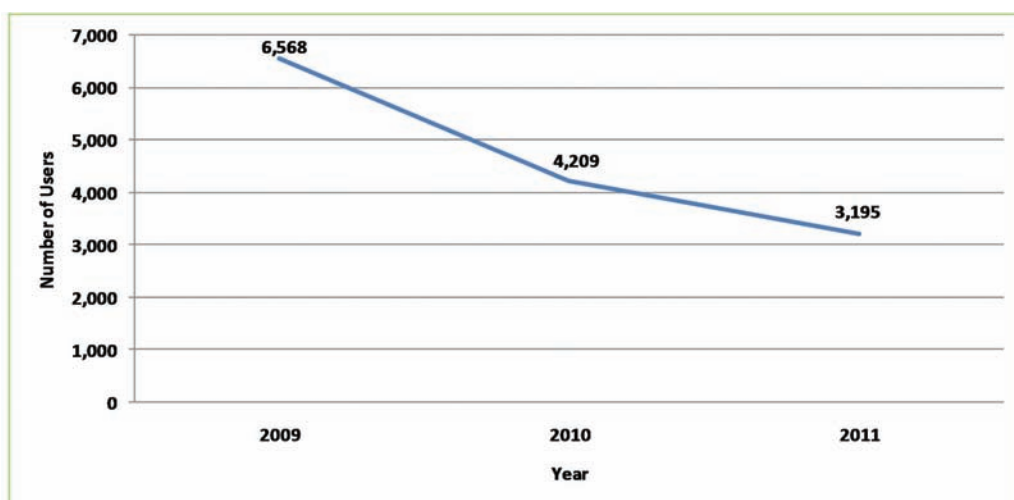
3.3.2 From Figure 6, it is evident that, since 2008, the number of SMS reports received has been decreasing, by around 74 per cent, until year

ending 2011. Moreover, the number of SMS reports received through different mobile phones, assumed to represent different persons, also declined, Figure 7 refers.

3.3.3 The foregoing implies that public participation in this vehicle emissions reduction Campaign has been declining during recent years, by approximately 51 per cent from 2009 to 2011. This decrease may be attributed to the following factors:

- The improvement in air quality due to an overall reduction in vehicle emissions, as referred to in Chapter 1 of this Report.

Figure 7 : Number of Users of the EAC SMS reporting per year (2009 to 2011)



Source: TM.

- The lack of continuity in the publicity component of the EAC. This shall be further examined in Section 3.8 of this Chapter.
- Other contributing factors such as the change in public transport buses to 'Euro 5' emissions standard engines. Further details regarding new measures and initiatives are found in Chapter 1 of this Report.

3.4 An Expression of Interest for a customised IT enforcement system has been pending since 2010

3.4.1 Despite the decline in the public's participation in the EAC, this initiative forms a complimentary element within the vehicle emissions control framework. There were minimal policy changes relating to the EAC's objectives and operational framework since the 'VECS Audit Report (2009)'.

3.4.2 However, TM developed an Expression of Interest to automate its operations related to the Campaign through a customized Information Technology (IT) enforcement system. Some of the primary functional requirements for this application include the automatic analysis of the SMS reports received and the generation of the list of vehicles to be called in for the emissions test.

3.4.3 In addition, the customised IT enforcement system was expected to integrate with TM's systems to generate mail merges and be able to interface with

all the relevant stakeholders such as the Test Centre, the Common Database (CBD) and also with the Vehicle Registration Administration (VERA) system. This integration is considered essential since the net result will be an improved synchronised operation, facilitating the timely sharing of vital information, such as the registering of restrictions issued. Further details are found in Section 3.6.

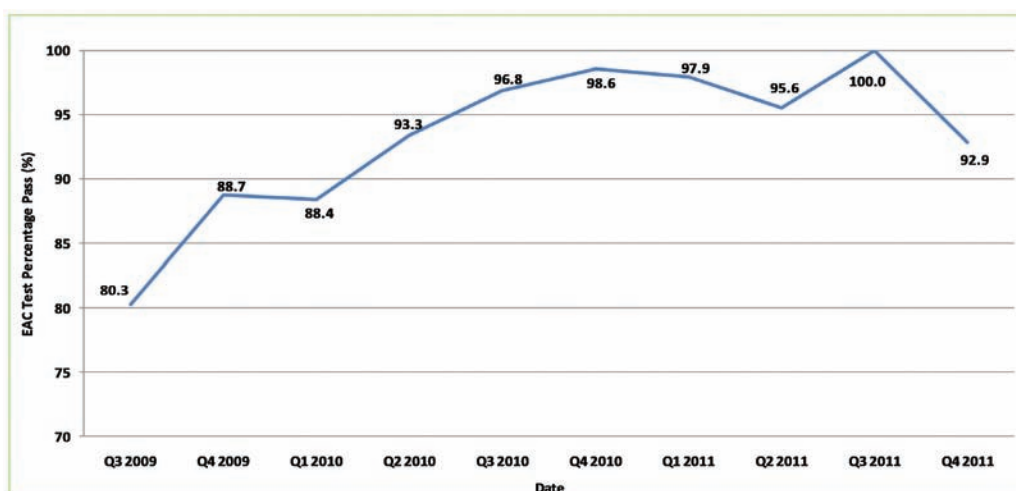
3.4.4 Transport Malta completed the drafting of this document in May 2010. However, the Authority contends that this Expression of Interest was not published due to lack of funds. Consequently this situation has prevented TM from comprehensively and accurately evaluating the cost benefit of such a system.

3.5 More summoned vehicles are passing the EAC test

3.5.1 The number of vehicles which are found to be emissions compliant following an EAC test is increasing. In 2011, 252 vehicles were summoned by TM for an EAC test. The pass rate was 97 per cent from the 137 tested vehicles. This contrasts with the situation reported following the 'VECS Audit Report (2009)', where 1,448 EAC tests were performed between July and December of 2009, and the pass rate was 81 per cent, Figure 8 refers.

3.5.2 The increasing trend of the EAC's test pass rate can be primarily attributed to vehicle owners making the necessary maintenance and repairs

Figure 8 : EAC test Pass rates (July 2009 to December 2011)



Source: TM.



to ensure a successful test outcome. Such action is in line with TM guidelines, included in the EAC test notice, which encourage owners to address any malfunctions in order to avoid the stipulated penalties should the vehicle be found to be non-compliant to predetermined emissions levels.

3.6 The number of ‘no shows’ for the EAC test increased by 13 per cent between 2009 and 2011

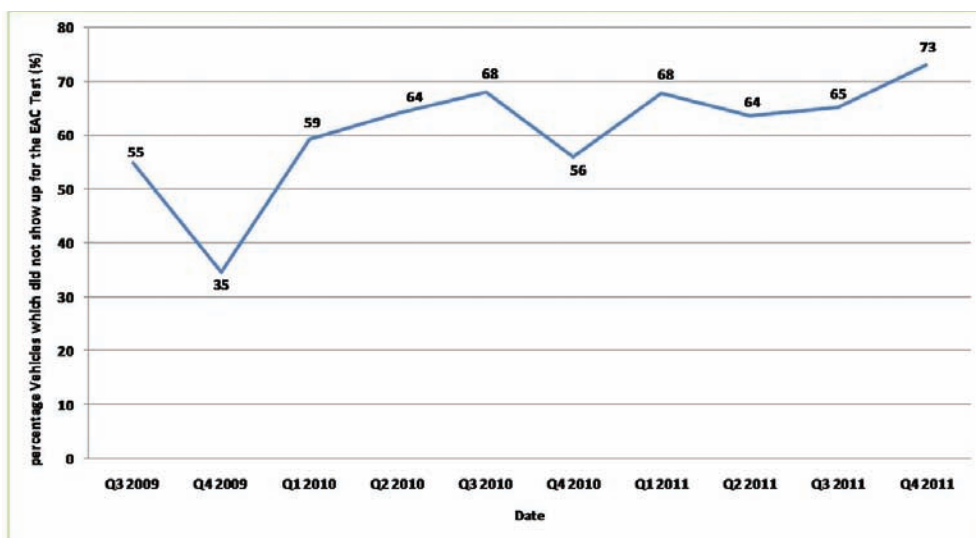
3.6.1 In 2011, 252 vehicles were summoned for an EAC test through 411 notices. However, in 274 cases, vehicle owners did not show up at TM’s facilities. This constitutes a 13 per cent increase

in the number of ‘no shows’ for 2011 over 2009. Figure 9 reveals the percentage of vehicles which did not show up for the EAC test, per quarter, during the period July 2009 to December 2011.

3.6.2 The Authority’s policy regarding EAC ‘no shows’ entails that if the vehicle in question fails to be examined or re-examined at TM’s facilities when requested, the vehicle’s annual circulation license will be suspended until such time that the vehicle has been examined and certified roadworthy.

3.6.3 A review of the 411 notices issued by TM in 2011, relating to 252 vehicles shows that a considerable number of ‘no shows’ occur on the

Figure 9 : Percentage of vehicles which did not show up for the EAC test, per quarter (July 2009 to December 2011)



Source: TM.

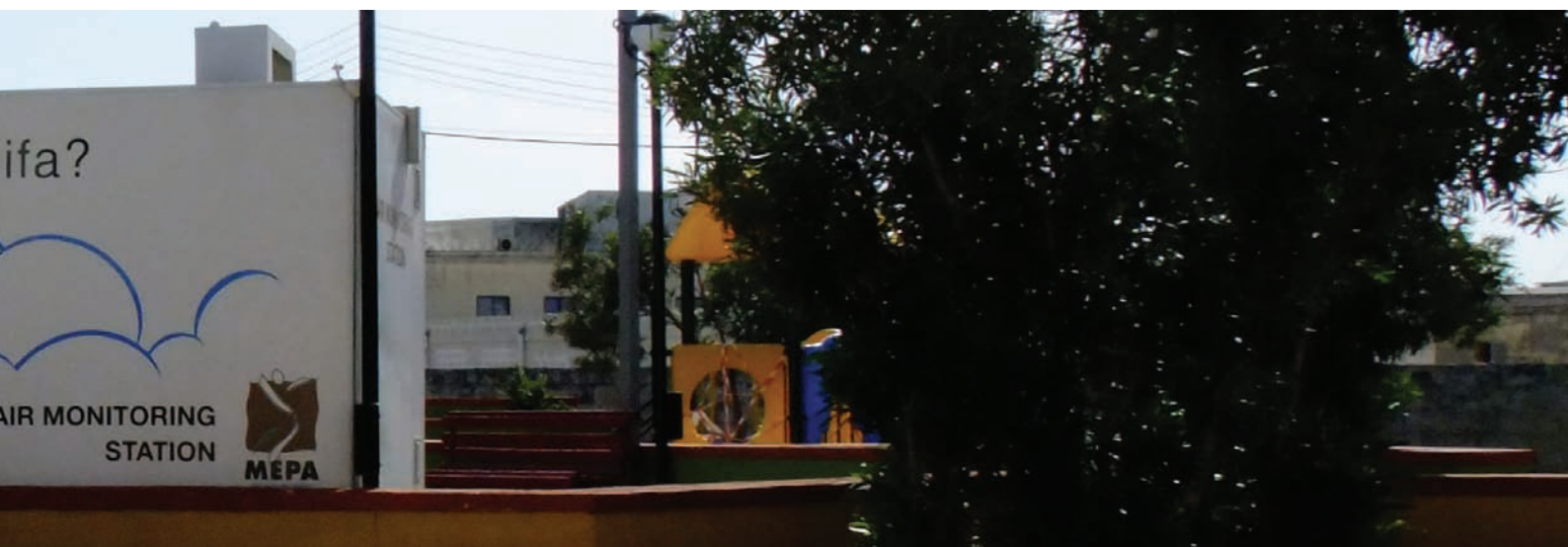


Table 2 : Vehicle availability for EAC test (2011)

Number of notices received per vehicle during 2011	Vehicles summoned for EAC test by TM (number)	Vehicle made available for EAC test (number)
One notice	97	92
Two notices	152	43
Three notices and more	3	2
Totals	252	137

Source: TM.

receipt of the first EAC test notice. A number of owners, however, also opt to ignore the second and subsequent EAC test notices, Table 2 refers.

3.6.4 From the 252 vehicles summoned for an EAC test during 2011, a random sample of 60¹⁶ out of the 160 vehicles that did not show-up following the receipt of one or more EAC test notices was analysed by the NAO. A review of the 60 vehicles showed that a restriction was imposed in 79 per cent of cases after the second consecutive 'no show'. Transport Malta noted this observation and shall be ensuring that procedures are consistently applied.

3.6.5 This situation mainly arises since EAC testing personnel do not have the facility to post restrictions on vehicles through the VERA, which is managed by the Licensing and Testing Directorate (LTD). Matters are further complicated since the LTD registers batches of restrictions at isolated intervals, which consequently increases the lead time between the 'no show' and the registering of the restriction

imposed on the vehicle's annual circulation license. In fact such duration between the issuing and registering of restrictions has been confirmed through the above mentioned sample of 60 notices issued in 2011, whereby an average duration period of 95 days was recorded. This lack of an immediate enforcement action by TM results also in additional time being taken to rectify a non-compliant vehicle, consequently increasing hazardous vehicle emissions.

3.7 Non-compliance with TM's report threshold policy and the timeliness of EAC testing prevails

3.7.1 The 'VECS Audit Report (2009)' reported that a thorough assessment of TM's filtering process could not be carried out due to an incomplete audit trail. The filtering process is a critical element of the Campaign since it enables the identification of potentially polluting vehicles, as reported through SMS by the public. Transport Malta has now rectified

¹⁶ For the purpose of this analysis, the 92 vehicles which were made available for an EAC test upon receipt of the first EAC test notice sent by TM, were excluded.

this situation through a more suitable computer application. This application facilitates queries in respect of SMS reports received.

3.7.2 Despite these improvements, the following issues noted in the ‘VECS Audit Report (2009)’ persist. The computer application used to process SMS reports does not provide any audit trail of the filtering process – for example, the computer application is not capable of identifying different users and is not even password protected. Moreover, the inputting process is carried out manually, with a considerable amount of data handling. Thus the system is very time-consuming and prone to transcription errors.

TM’s policy of subjecting vehicles to an EAC test was not always adhered to

3.7.3 According to TM’s prescribed follow-up procedures, vehicles which get reported three times by at least three different mobile phone numbers within a three month period would be summoned for an EAC test. The ‘VECS Audit Report (2009)’ noted that, in practice, the Authority was testing vehicles following the receipt of four or more SMS reports from different mobile phone numbers within the afore mentioned period. The NAO follow-up revealed that this situation prevails.

3.7.4 Transport Malta contends that this situation occurs since the Authority has to prioritize testing of vehicles which received a greater number of reports,

and consequently deemed to pose a greater risk of polluting. Prioritization is resorted to since TM lacks the human resources to carry out more EAC tests.

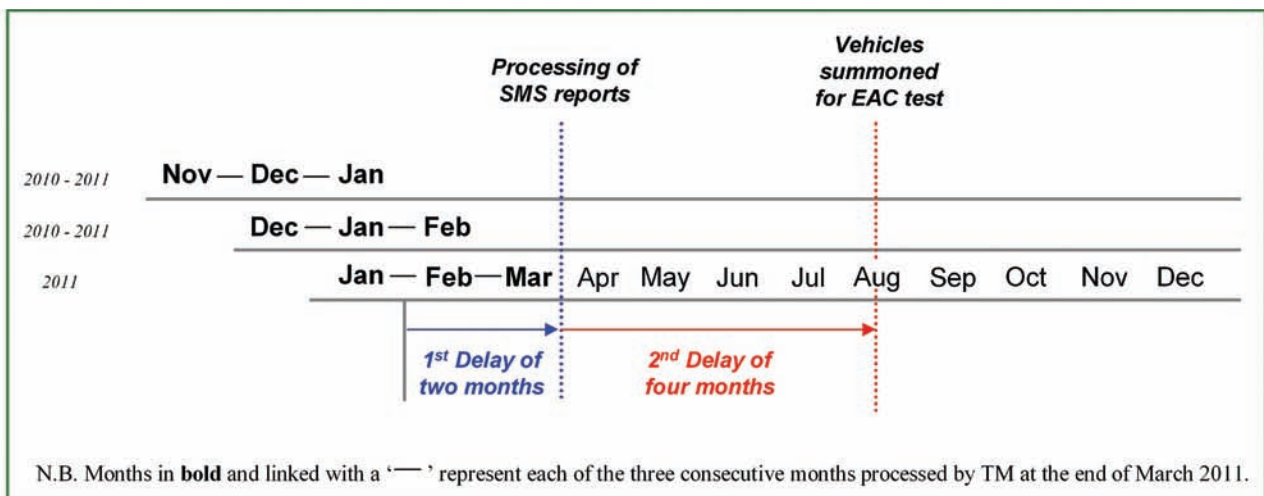
It may take more than six months for reported vehicles to undergo an EAC test

3.7.5 A review of the 411 EAC test notices issued by TM during 2011 revealed that it may take more than six months for a vehicle to be tested following TM’s quarterly filtering process. There are various stages in the process of testing potentially non-compliant vehicles.

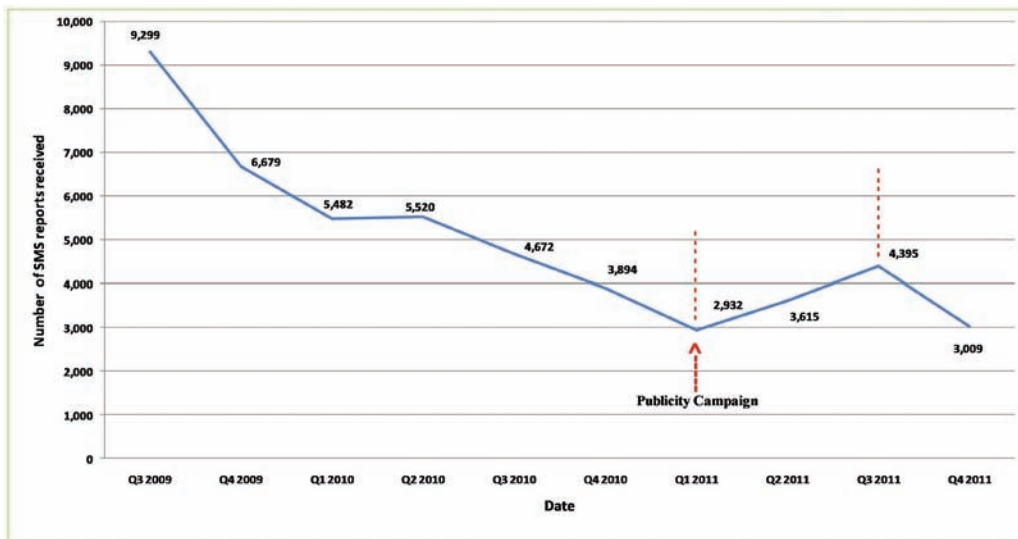
3.7.6 Although TM is identifying those vehicles which have reached the SMS report threshold within the three consecutive month time-window, it is processing the mobile phone text messages received every quarter. By not processing SMS reports on a monthly basis, TM would have forfeited the opportunity to process reports received at the end of each three consecutive month time-window. Consequently, a maximum delay of two months results when a vehicle reaches its reports threshold before TM’s processing date, Figure 10 refers.

3.7.7 A second major time lag of approximately four months occurred between TM’s processing of SMS reports and the summoning of potentially non-compliant vehicles for an EAC test. Seventy-eight out of 86 vehicles called for an EAC test on 19 August 2011 had reached their report threshold during the

Figure 10 : Delays in the processing and summoning of potentially non-compliant vehicles for an EAC test



Source: TM.

Figure 11 : Quantity of SMS reports received per quarter (July 2009 to December 2011)

Source: TM.

period January to March 2011. Such a delay may occur since TM has reduced the number of EAC tests carried out from an average of 241 monthly in 2009 to approximately 11 monthly in 2011. These circumstances materialised due to TM's other priorities, namely those relating to the reform of public transport.

3.7.8 The foregoing is conducive to enabling potentially polluting vehicles, as identified by the public, to be utilised for several months prior to being subjected to an EAC test. Transport Malta contends that such processing times are not reducing the effectiveness of the EAC, since ultimately potentially non-compliant vehicles are summoned for emissions testing. Nevertheless, the Authority noted that it will continue to identify areas for potential improvement.

3.8 Call for improved continuity in the publicity component of the EAC

3.8.1 Transport Malta's publicity component of the EAC entails that vehicle owners are reminded about the SMS number on every road licence that is printed, a banner on the TM website which encourages people to send SMS reports and some adverts are issued to remind people about the Campaign. Notwithstanding these efforts, public response declined. In part, such a decline may be attributed to a significant decrease in SMS reports received in relation to former public transport buses and the overall improvement registered in air quality.

3.8.2 Public interest in this scheme was, however, revived in early 2011 through a publicity campaign. Costs incurred by TM in this respect amounted to €2,448. In the immediate aftermath of such publicity in 2011, the declining trend of SMS reports received was reversed, Figure 11 refers.

3.8.3 Figure 11 also indicates that the positive effects of such a publicity campaign remained effective for around six months where the number of SMS reports received increased from around 2,932 to 4,395. However, following this period, the number of reports received declined to the same level prior to the undertaking of TM's awareness raising programme.

3.8.4 It is to be noted that, contrary to the previous publicity initiatives undertaken, TM's 2011 publicity campaign did not seek to educate owners about the benefits of regular vehicle maintenance, especially with regards the prevention of excessive vehicle emissions.

3.9 Conclusion

3.9.1 To varying degree, TM sought to implement the recommendations about enhancing the effectiveness of the EAC which were proposed in the 'VECS Audit Report (2009)'. Transport Malta has partially improved its audit trails relating to the processing of SMS reports received from the public. Moreover, in the light of a declining trend in public

participation, TM sought to revive the EAC through a publicity campaign in 2011. Despite TM's efforts, the EAC is still subject to operational limitations which ultimately impinge on its effectiveness. In such instances potentially non-compliant vehicles, as identified by the public, continue to be utilized for a substantial number of months to the detriment of Malta's ambience air quality.

3.9.2 Transport Malta does not have the IT infrastructure to support the EAC. Although an Expression of Interest was drafted, lack of funds prohibited the Authority from making further progress in this regard. The non-availability of the appropriate data management applications is conducive to inefficiencies when processing and analyzing the SMS reports received. Data is still not

analysed in real-time, which consequently leads to substantial delays in calling and testing of potentially non-compliant vehicles at TM's facilities.

3.9.3 The lack of the appropriate data management applications also translates itself into enforcement inefficiencies. Transport Malta is unable to immediately impose a restriction on the renewal of the vehicle's annual circulation license. In such circumstances, TM cannot effectively prohibit vehicles which were not made available or failed the EAC test from being on the road.

3.9.4 The next Chapter of this Report deals with Roadside Technical Inspections which are undertaken by TM.



Chapter 4

Roadside Vehicle Emissions Test

Chapter 4 – Roadside Vehicle Emissions Test

4.1 Introduction

4.1.1 Surprise roadside checks of vehicle emissions are of critical importance since they aim to ensure that vehicles are appropriately maintained at all times, and not just prior to the Vehicle Roadworthiness Test (VRT). This Chapter focuses on the extent to which recommendations proposed by the National Audit Office (NAO) through the 'VECS Audit Report (2009)', have been implemented in order to ensure that this enforcement mechanism is contributing to maintain vehicle emissions within the permissible limits set by law.

4.1.2 Roadside Technical Inspections (RTIs) are carried out by the Enforcement Directorate within Transport Malta (TM). Up to 2009, these inspections, which focus on all aspects of vehicle safety and maintenance, used to be complemented by Roadside Emissions Tests (RETs) which were commissioned by the Joint Committees of Local Councils and carried out by Local Wardens.

4.1.3 The RTIs performed by TM are measures emanating from Commission Directive 2010/47/EU of 5 July 2010, amending European Parliament and Council Directive 2000/30/EC of 6 June 2000. The VRT Regulations¹⁷ transpose this European Union (EU) requirement to conduct surprise RTIs especially on the heavy-use (generally commercial)

vehicles into Maltese Law. Consequently, roadside inspections (including emissions testing) are mostly carried out on the following vehicle categories:

- vehicles used to carry passengers with at least eight passenger seats;
- vehicles weighing more than 3,500kg, and used for the carriage of goods;
- trailers and semi-trailers weighing more than 3,500kg.

4.1.4 Roadside Technical Inspections verify several aspects of the vehicles' overall condition,¹⁸ primarily related to safety, security and environmental protection. The latter is subdivided into spillage of fuel or oil, and emissions, which are categorised as follows:

- the exhaust system;
- the smoke opacity of diesel-engine vehicles;
- gaseous emissions of petrol-engine vehicles.

4.1.5 Since 2006, the Vehicle Inspectorate Unit (VIU), which forms part of the Enforcement Directorate within TM, is responsible for carrying out RTIs.¹⁹ These inspections are undertaken by five Enforcement Officers. On average, these officers

¹⁷ Motor Vehicle Roadworthiness Test Regulations Subsidiary Legislation 65.15.

¹⁸ Refer to Appendix I.

¹⁹ Besides the RTIs, the VIU also undertake inspections related to the carriage of dangerous goods, tachograph checks, inspections related to overloading of vehicles, inspections on buses, company checks, follow-up inspections related to vehicles stopped during roadside checks and inspections following reports from TM officials.

allocate a total of around 30 hours per week to conduct RTIs. Enforcement Officers have the power to stop any vehicle on the road, including vehicles registered in another country.

4.1.6 Transport Malta's practices entail that, in those instances where faults have been identified, the vehicle owner is requested to carry out the necessary maintenance and then to report at the VIU Garage for a follow-up test or a VRT. In case of major faults, the owner of the inspected vehicle would be issued with a traffic offence ticket by TM officials. If the faulty vehicle does not turn up for the follow-up inspections, or fails the tests, the Licensing and Testing Directorate would be instructed to set a restriction on the renewal of the vehicle's annual circulation license.

4.1.7 Furthermore, if an inspected vehicle is found to be in a very bad condition, the driver would be obliged to garage the vehicle immediately. The number plates would be revoked until the vehicle is repaired.

4.2 Situation as reported by the NAO in July 2009

4.2.1 The 'VECS Audit Report (2009)' pointed out that, during the period under review, both RETs and RTIs were able to identify a significant number of vehicles with excessive emissions, throughout all vehicle categories. Roadside Emissions Tests were, however, discontinued in early 2008. The 'VECS Audit Report (2009)' also reported that roadside inspections primarily concentrated on commercial and public transport vehicles, and targeted mainly diesel-engine vehicles. Consequently, high-risk petrol-engine vehicles remained largely untargeted.

4.2.2 The 'VECS Audit Report (2009)' also remarked that Gozo based vehicles were hardly targeted during RTIs. Moreover, it was concluded that with an enhanced management framework, risk based targeting and better coordination between the two schemes, roadside inspections had an essential and complementary role within the vehicle emissions control regime.

4.2.3 In view of the findings and conclusions reported in the 'VECS Audit Report (2009)', the NAO's recommendations included:

- Roadside emissions tests are to be conducted on a more frequent basis, particularly targeting vehicles older than eight years, and the vehicle categories with a high failure rate in roadside tests or in VRT.
- Considerations be given for the RETs conducted, as part of the Local Enforcement System, to be restarted with an improved regulatory framework. This scheme had the potential of being highly effective at identifying vehicles with excessive emissions as it exclusively focused on vehicle emissions.

4.2.4 The next sections of this Chapter discuss the extent to which these recommendations have been implemented by TM. Since RETs were discontinued, findings and conclusions presented in the ensuing sections are based on an analysis of the RTIs carried out by TM during the period 2009 to 2011.

4.3 Emissions related failures detected through RTIs have decreased

4.3.1 The importance of roadside tests is emphasized by the fact that the VRT standards of vehicle maintenance tend to be short-lived, hence the relevance of RTIs as a control mechanism. Towards this end, an NAO test of 322 vehicles subjected to an RTI during 2011 revealed, that on average, the failed vehicles had been VRT certified around eight months prior the surprise roadside inspection.

4.3.2 A number of variables should ideally dictate the number and extent of these inspections. Factors which could be considered include vehicle emissions trends with regards air quality, previous roadside inspection results, trends emanating from VRT testing and other enforcement schemes, as well the availability of resources to conduct such tests.

4.3.3 Table 3 shows the number of roadside inspections carried out during the period under review by the 'VECS Audit Report (2009)' and the period 2009 to 2011.

4.3.4 This demonstrates that the number of roadside inspections, which may also incorporate emissions testing, has been decreasing over the years. In fact, there has been a decline from a total



Table 3 : Roadside Inspection (2007 to 2011)

	RTI quantity	RET quantity	Total attainable Emissions tests (RTI & RET)
October 2006 to June 2007 ²⁰	1,552	1,613	3,165
2009	2,693	0	2,693
2010	2,812	0	2,812
2011	1,979	0	1,979

Source: TM.

of 3,165 to 1,979 roadside tests carried out during the period under review by the 'VECS Audit Report (2009)' and 2011 respectively.

4.3.5 Most notably the decrease is evident in the aftermath of the curtailment of the RETs, which were carried out by Local Wardens up to early 2008. To date, no official studies have been carried out to ascertain whether the effects resulting from the curtailment of the RETs, which specifically targeted emissions, have been appropriately absorbed through the current RTI regime.

4.3.6 However, two main factors indicate that the curtailment of RETs have left a gap in the vehicle emissions control framework. Primarily RETs were roadside inspections which totally focused on vehicle emissions. In fact, around half of the vehicles tested

were found to be non-compliant. Such a hit-rate is substantially higher than the current RTI emissions hit-rate of less than 6.5 per cent.²¹ Secondly, even when assuming that each roadside test carried out by TM entails an emissions test, the number of tests undertaken by this Authority in 2011 is still around 37 per cent lower than the total number of roadside inspections carried out during the period under review by the 'VECS Audit Report (2009)'.

4.3.7 The number of roadside tests carried out by TM in 2011 was around 30 per cent lower than the number of RTIs carried out in the previous year. Such a decline is mainly attributable to a decrease in TM's resource allocation for RTIs. Transport Malta contended that it was constrained to take such a measure since the launching of the new bus service was given priority over roadside inspections.

²⁰ Period under review during the 'VECS Audit Report (2009)' (amounts quoted are calculated on a 12 month period).

²¹ The 6.5 per cent includes both the emissions failures, related to the actual fumes, and exhaust failures related to the physical component of the exhaust system.

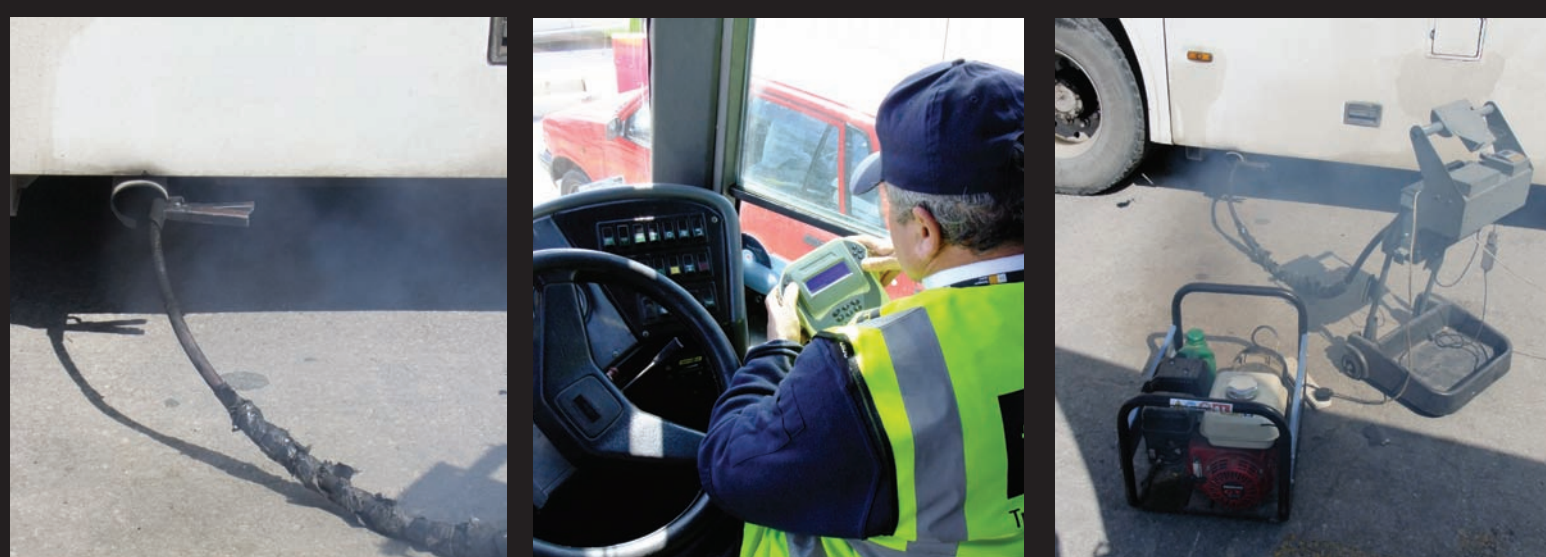


Table 4 : RTI results (2010 and 2011)

		LGV	Lorry	Mini/Bus & Coach	Articulated	Road Trains	Private	S/Trailer ²²	Trailers
2010	Inspections	661	782	538	272	12	547	275	12
	Failure	323	411	365	122	7	235	143	8
	% Failure	48.9	52.6	67.8	44.9	58.3	43.0	52.0	66.7
2011	Inspections	504	537	433	171	10	324	171	10
	Failure	264	308	278	81	4	130	108	6
	% Failure	52.4	57.4	64.2	47.4	40.0	40.1	63.2	60.0

Source: TM.

Roadside Technical Inspections targeting is still predominantly dependant on the enforcement officers' acumen and alertness

4.3.8 During 2010 and 2011, RTIs carried out by TM targeted 2,812 and 1,979 vehicles respectively. The majority of these vehicles were light goods vehicles, lorries, mini-buses, buses and coaches. Table 4 compares the test results among the various vehicle categories targeted through RTIs.

4.3.9 The emissions component of the RTI revealed that 6.5 per cent of vehicles failed this test during 2011. The resultant test's hit-rate is dependant on a number of variables, such as the vehicle's age, utilisation, degree of maintenance and not least the ability of TM's enforcement officers to detect potentially defaulting vehicles.

4.3.10 Despite the NAO's recommendation in the 'VECS Audit Report (2009)', TM has not yet fine-tuned its RTI targeting practices through the analysis of the variables indicated in the preceding paragraph. Consequently, the Authority is only able to provide general targeting guidelines to its enforcement officers. Such direction entails that enforcement officers focus on the older, poorly maintained and excessively emitting vehicles.

4.3.11 On analysis, it was revealed that the average age of the vehicles which successfully passed the roadside inspection is 21 years, while those vehicles which failed the test have a relatively higher average age of 25 years. The foregoing is based on a review of 322 randomly selected vehicles from the 1,979 which were subjected to a surprise roadside technical inspection during 2011. The outcome of this analysis

²² S/Trailers and Trailers were not applicable for an emission and exhaust check.

Table 5 : RTIs performed on diesel and petrol-engine vehicles (2009 to 2011)

Year	Population of Diesel vehicles			Population of Petrol vehicles			Total Population of Diesel and Petrol vehicles		
	Commercial & Public	Total RTIs	% of Commercial & Public vehicles undertook a RTI	Commercial & Public	Total RTIs	% of Commercial & Public vehicles undertook a RTI	Commercial & Public	Total RTIs	% of Commercial & Public vehicles undertook a RTI
2009	45,682	2,663	5.8	1,589	30	1.9	47,271	2,693	5.7
2010	45,696	2,778	6.1	1,555	34	2.2	47,251	2,812	6.0
2011	45,751	1,959	4.3	1,539	20	1.3	47,290	1,979	4.2

Source: NSO and TM.

reaffirms that the age of the vehicles inspected through RTIs is a critical targeting consideration.

4.3.12 The absence of more formal guidelines implies that RTIs targeting is still predominantly dependant on the enforcement officers' acumen and alertness. Such circumstances prevent TM from further improving the outcome of its RTIs. To a certain extent, the lack of formal and more specific targeting guidelines is mitigated by the fact that enforcement officers received formal training by the Vehicle and Operator Services Agency (VOSA) and have each accumulated an experience of around six years in vehicle emissions testing.

The roadside inspection regime is still only marginally targeting commercial petrol-engine vehicles

4.3.13 Roadside Technical Inspections predominantly aim to target vehicles within the commercial and public categories, where around 97 per cent of which are diesel-engine. During the period 2009 to 2011, 99 per cent of the RTIs were performed on diesel-engine vehicles.

4.3.14 Similarly to the situation reported in the 'VECS Audit Report (2009)', the general focus on the high-risk diesel-engine vehicles was at the expense of RTI coverage on petrol-engine vehicles. In fact, during 2011, only 20 inspections were carried out on the 1,539 petrol-engine vehicles within the relevant categories, Table 5 refers. It is pertinent to note that these vehicles have an average age of 24 years which, when coupled with their probable high utilization rate, render them highly prone to exceed the permissible emissions level.

4.3.15 The low number of petrol-engine vehicles subjected to RTIs could also emanate from another practicality. Such problems may arise as it is difficult to detect defaulting petrol-engine vehicles since, unlike their diesel-engine counterparts, they tend to emit clearer exhaust fumes.

4.4 RTIs increased targeting the Gozo-based vehicles, while RTIs undertaken in Malta are held in less locations

4.4.1 The location at which roadside inspections are held is an important element which contributes to the overall effectiveness of this control mechanism. Primarily, the testing locations have to cater for the safety of enforcement officers, the driver and passengers in the vehicle under test, as well as to other road users. The road lay-by identified as the testing location must also offer the necessary area to enable the conduct of vehicle roadside inspections. Due considerations have also to be given so that roadside tests do not hinder traffic flows. Operationally, the location is also important to enable appropriate coverage throughout most regions of Malta and Gozo, which consequently ensures that all vehicles could be subjected to such tests.

4.4.2 Since the 'VECS Audit Report (2009)', the locations where roadsides tests were held decreased in Malta while more inspections were held in Gozo. Although the matter is still in the process of being analysed further, TM contends that the primary reason for the decline in testing locations in Malta relate to safety issues and the probability that traffic flows in the chosen location would encompass a high degree of vehicles pertaining to the public and commercial categories, Table 6 refers.

Table 6 : RTI Locations

Region	As reported in 'VECS Audit Report (2009)'			As at end 2011		
	Number of different locations utilised for the conduct of RTIs	Frequency of RTI	Quantity of RTI	Number of different locations utilised for the conduct of RTIs	Frequency of RTI	Quantity of RTI
Northern	11	83	509	8	54	627
Northern Harbour	6	69	280	1	1	14
Southern Harbour	14	82	395	6	268	922
South Eastern	11	51	235	5	28	276
Western	4	6	19	4	23	261
Gozo	1	1	17	1	11	60
Totals	47	292	1,455	25	385	2,160

Source: NSO and TM.

4.5 The audit trail related to RTIs has been strengthened

4.5.1 Since the 'VECS Audit Report (2009)', TM has strengthened the audit trail related to RTIs undertaken. Such audit trails also extend to the calibration of equipment utilised by TM during these inspections.

4.5.2 In addition to manual records, following the publication of the 'VECS Audit Report (2009)', TM is also maintaining RTI data in electronic format. In spite of such an improvement, data analysis is still limited since RTI data is not integrated with the core Vehicle Registration and Administration System (VERA). This limits certain data analysis and precludes that such information is utilised as inputs by other vehicle emissions control mechanisms. Consequently, the opportunity to facilitate inspection targeting and enforcement measures, such as the vehicle's annual circulation licence renewal restrictions in case of defaulting vehicles, is not being exploited. However, TM contends that currently it is in the process of addressing the issues referred to in this paragraph.

4.6 Conclusion

4.6.1 Roadside testing constitutes an important control mechanism since it encourages vehicle owners to maintain their vehicles up to the required standards at all times. Despite the increase in the number of RTIs undertaken by TM, the lacuna which materialised after the curtailment of RET in 2008 prevails. Even though TM carries out emissions tests on targeted vehicles, a gap materialises as the Authority is not legally obliged to test emissions levels when conducting RTIs. In fact, even if it is considered that all of the RTIs conducted included emissions testing, the number accomplished would still be considerably less than the level of emissions roadside testing reported upon in the 'VECS Audit Report (2009)'.

4.6.2 The targeting of RTIs is still highly dependant on the acumen of enforcement officers. Such circumstances arise since TM only provides its officials with general targeting guidelines. The provision of more specific guidelines would increase further the already substantial number of defaulting vehicles detected through TM's roadside tests. A case in point relates to the fact that very few petrol-engine vehicles are subjected to roadside tests.



Appendix

Appendix I – Technical Roadside Inspection Report (as set out in Commission Directive 2010/47/EU Annex I)

SPECIMEN TECHNICAL ROADSIDE INSPECTION REPORT INCORPORATING A CHECK-LIST

1. Place of check

2. Date

3. Time

4. Vehicle nationality mark and registration number

5. Vehicle identification/VIN number

6. Category of vehicle

(a) N2^(a) (3,5 to 12 t) (e) M2^(a) (> 9 seats^(b) to 5 t)

(b) N3^(a) (more than 12 t) (f) M3^(a) (> 9 seats^(b) more than 5 t)

(c) O3^(a) (3,5 to 10 t) (g) Other vehicle category (Article 1(3))

(d) O4^(a) (more than 10 t)

7. Undertaking carrying out transport

(a) Name and address

.....

(b) Number of the Community licence^(c) (Regulation (EC) No 1072/2009)

8. Nationality (driver)

9. Driver name

10. Checklist

	Checked ^(d)	Not checked	Failed ^(e)
(0) identification ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(1) braking equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) steering ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) visibility ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) lighting equipment and electric system ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(5) axles, wheels, tyres, suspension ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(6) chassis and chassis attachments ^(f)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(7) other equipment including tachograph ^(f) and speed limitation device	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(8) nuisance including emissions and spillage of fuel and/or oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. Result of inspection:

Ban on using the vehicle, which has dangerous defects

12. Miscellaneous/remarks:

13. Authority/officer or inspector having carried out the inspection

Signature of:

Testing authority/officer or inspector	Driver
.....

Notes:

^(a) Vehicle category according to Annex II to Directive 2007/46/EC (OJ L 263, 9.10.2007, p. 1).

^(b) Number of seats including the driver's seat (item S.1 of registration certificate).

^(c) If available.

^(d) 'Checked' means that at least one or more of the inspection items listed in Annex II to Directive 2009/40/EC as amended by Directive 2010/48/EU of this group have been checked.

^(e) Defects indicated on the rear side.

^(f) Methods for testing and guidelines for assessment of defects according to Annex II to Directive 2009/40/EC as amended by Directive 2010/48/EU.

0.	IDENTIFICATION OF THE VEHICLE	2.	STEERING	4.6.	Reversing lamps	6.1.9.	Engine performance
0.1.	Registration number plates	2.1.	Mechanical condition	4.6.1.	Condition and operation	6.2.	Cab and bodywork
0.2.	Vehicle identification/chassis/serial number	2.1.1.	Steering gear condition	4.6.2.	Switching	6.2.1.	Condition
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