PA 01191/05
SLIEMA TOWNSQUARE
SLIEMA

Environmental Planning Statement - UPDATE

Update to EPS dated April 2007

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EPS Update

April 2011

Report for: Sliema Townsquare Limited

Revision Schedule

Rev	Date	Details	Prepared by:	Report Checked by:	Approved by:
0	April 2011	Submission to MEPA	**Rachel Xuereb** Director	**Adrian Mallia** Director	**Kevin Morris** Director

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adi ASSOCIATES ENVIRONMENTAL CONSULTANTS

Kappara Business Centre
113 Triq Birkirkara
San Gwann SGN 4197

Tel. / Fax: 21378172 - 77 – 80
Email: info@adi-associates.com
Web: www.adi-associates.com

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1. INTRODUCTION

PURPOSE OF THE UPDATE

1.1. An Environmental Planning Statement (EPS) was prepared on behalf of Townsquare Sliema Ltd, to support planning application PA 01191/05 for the redevelopment of the former Union Club site in Sliema into a high rise residential and office complex with shopping / food and beverage / leisure facilities and parking (hereinafter referred to as the Scheme). Planning application PA 01191/05 was validated by the Malta Environment & Planning Authority (MEPA) on 21st March 2005. The EPS was certified by MEPA in August 2007 and submitted for public consultation in September 2007.

1.2. In 2010, an EPS Update was presented to MEPA after discussions between MEPA and the Applicant resulted in changes to the building heights of the development. The EPS Update included an updated project description together with an assessment of impacts related to visual issues, shadowing, and wind.

1.3. Following further discussions between MEPA and the Applicant in February 2011, MEPA recommended that the Applicant further investigates the impacts of the Scheme on air quality. This second EPS Update includes a revised air quality impact assessment that is based on air quality impact parameters defined by MEPA. It is noted that at the time of writing the EPS in 2007 and the current EPS Update, new EU legislation on air quality has emerged and there have been significant attempts both at EU level and nationally to address the issue of traffic emissions.

2. LEGISLATION AND POLICY REVIEW

INTRODUCTION

2.1. This Chapter provides an overview of the current legislative requirements related to air quality, together with a review of the policy direction in relation to vehicle emissions at both the European Union and the local level. This section has been updated due to significant changes between 2007 and today that could have an impact on future emissions especially from vehicles.

AIR QUALITY LEGISLATION

European Legislation

2.2. European legislation on air quality falls under Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive entered into force on the 11th June 2008. It merges four Directives and one Council Decision into a single Directive on air quality and sets standards and target dates for reducing concentrations of fine particles ($PM_{2.5}$).

2.3. The Directive repeals the following legislation on air quality:

- Directive 96/62/EC (Ambient Air Quality Assessment and Management);
- Directive 1999/30/EC (relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air);
- Directive 2000/69/EC (relating to limit values for benzene and carbon monoxide in ambient air); and
- Directive 2002/3/EC (relating to ozone in ambient air).

2.4. Directive 2008/50/EC has not yet been transposed into Maltese legislation. Notwithstanding, Malta is still required to comply with the requirements of this Directive.

Maltese Legislation

2.5. Since Directive 2008/50/EC has not yet been transposed, the local air quality legislation is based on the preceding Directives:

- **Legal Notice 216 of 2001**: *Ambient Air Quality Assessment and Management Regulations, 2001* defines and establishes objectives for ambient air quality in Malta that are designed to avoid, prevent, or reduce harmful effects on human health and the environment as a whole. They establish common methods and criteria for the assessment of ambient air quality, and provide for public dissemination of information on ambient air quality. The Regulations require assessment and monitoring of air quality, the establishment of zones and agglomerations, and the preparation of action plans as appropriate

- **Legal Notice 224 of 2001 (as amended by LN 231 of 2004)**: *Limit values for Sulphur Dioxide, Nitrogen Dioxide and Oxides of Nitrogen, Particulate Matter and Lead in Ambient Air Regulations, 2001* sets out air quality standards for Particulate Matter (PM_{10}), SO_2, NO_2 and NOx. Revised limit values have since been set through Directive 2008/50/EC[1], although these have not yet been transposed into national legislation;

- **Legal Notice 163 of 2002**: *Limit Values for Benzene and Carbon Monoxide in Ambient Air Regulations, 2002* sets out air quality standards for Benzene and Carbon Monoxide;

- **Legal Notice 11 of 2003**: *Ozone in Ambient Air Regulations* defines and establishes objectives and target values for concentrations of ozone in ambient air in Malta in order to avoid, prevent, or reduce harmful effects on human health and the environment.

VEHICLE EMISSIONS: POLICY DIRECTION

2.6. The following section provides an overview of current and planned initiatives that aim to improve air emissions from vehicles.

European Level

Euro 5 and Euro 6 Standards

2.7. In 2007, the European Commission (EC) introduced two new standards in order to improve the level of emissions from light vehicles. The Euro 5 and Euro 6 standards aim to reduce engine emissions, in particular for particulate matter (PM) and nitrogen oxides (NOx) emissions from diesel cars. Regulation (EC) No 715/2007 sets out the implementation timeframes and the limit values for these two standards.

2.8. The Euro 5 standard came into force on 1 September 2009. As of 1 January 2011, Member States cannot allow the registration and sale of new vehicles that are not compliant with this standard. This standard improves PM emissions from diesel engines by 80 per cent over the Euro 4 standard, see **Table 2.1**.

Table 2.1: Emissions Standards in relation to PM and NOx

Emissions standard (year of entry into force)	**Particulate matters (PM) (mg/km)**		**Oxides of nitrogen (NOx) (mg/km)**	
	Diesel	**Petrol**	**Diesel**	**Petrol**
Euro 2 (1996)	80-100	-	-	-
Euro 3 (2000)	50	-	500	150
Euro 4 (2005)	25	-	250	80
Euro 5 (2009)	5	5	180	70
Euro 6 (2014)	5	5	80	70

[1] Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe. It repealed Directives 96/62/EC, 1999/30/EC, 2000/69/EC and 2002/3/EC as from 11 June 2010.

Source: EurActiv.com, Euro 5 emissions standards for cars, Last accessed 11 April 2011 from http://www.euractiv.com/en/transport/euro-5-emissions-standards-cars/article-133325

2.9. The Euro 6 standard will enter into force in September 2014 and shall be applicable as from September 2015 to all new cars that are registered and purchased in Member States. This standard sets significantly lower limits for NOx emissions from diesel cars compared to the Euro 5 standard, see **Table 2.1**.

Green vehicles strategy

2.10. The green vehicles strategy was presented by the EC in April 2010[2]. It aims at encouraging the development and market uptake of clean and energy efficient vehicles, thereby reducing the environmental impact of road transport. This will be achieved by promoting clean and energy efficient vehicles that are based on conventional internal combustion engines and facilitating the deployment of breakthrough technologies in ultra-low-carbon vehicles.

2.11. The strategy includes a number of actions that the EC will undertake such as:

- Preparing measures to implement Regulation (EC) No 443/2009[3] by 2011;
- Presenting a proposal by 2011 to reduce fuel consumption impacts of mobile air conditioning systems;
- Ensuring that CO_2 and pollutant emissions are reduced under real-world driving conditions;
- Promoting additional measures that may help to decrease CO_2 and pollution emissions from road transport such as eco-driving and Intelligent Transport Systems; and
- Presenting in 2010 guidelines on financial incentives for consumers to buy green vehicles.

Transport White Paper

2.12. The Transport White Paper is a roadmap presented by the EC of 40 initiatives for the next decade. It aspires to build a competitive transport system that will increase mobility, remove major barriers in key areas, and fuel growth and employment. The White Paper includes the following long-term goals to:

- Halve the use of 'conventionally-fuelled' cars in urban transport by 2030;
- Phase out 'conventionally-fuelled' cars in cities by 2050; and

[2] COM(2010)186 final
[3] Regulation (EC) No 443/2009 on setting emission performance standards for new passenger cars as part of the Community's integrated approach to reduce CO_2 emissions from light-duty vehicles.

- Achieve CO_2-free city logistics in major urban centres by 2030. This would also help to substantially reduce other harmful emissions.

2.13. The White Paper was launched in March 2011.

Revision of the European Union Air Quality Policy

2.14. In 2005, the European Commission (EC) launched the *Thematic Strategy on Air Pollution* and the *Clean Air For Europe (CAFE)* programme. The overall objective was to *achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment*. Six years later, the Commission has started discussions on reviewing its air policy with particular emphasis on the National Emission Ceilings Directive.

2.15. The Commission recognises that current policy efforts, at EU and national level, have not fully delivered the expected results. The limit values of PM and NO_2 are exceeded in many urban areas whereas global emissions of NOx are not decreasing as much as expected. Reasons for this include the increase in transport volume and the slower turnover of vehicle fleets. For this reason, the EC has started work on a new clean air strategy to be adopted by no later than 2013. At this stage, a working document[4] has suggested short-term policy actions such as:

- addressing the "real world" emissions, including speeding up the adoption of a revised test cycle for the type approval of vehicles signalled in the Communication a European Strategy on Clean and Energy Efficient Vehicles; and

- promoting the upgrading of vehicles to the highest possible standards based on innovative or already available and tested retrofit technologies and also building on the experience on retrofitting in the Member States.

2.16. The review of the Air Quality Policy aims to produce a robust Clean Air package that updates existing policies and directives (including the National Emission Ceilings Directive) according to latest science and outlines further cost-effective measures.

National

Vehicle Registration Tax and Circulation Tax

2.17. During the Budget Speech for 2009, a new vehicle registration taxation system was announced that encourages the purchase of smaller vehicles that emit lower levels of pollutants and apply cleaner technologies. This tax is payable upon first registration of a vehicle in Malta and is based on a vehicle's CO_2 emissions, PM_{10} emissions (for diesel engines), age, and value. Under the new system, bigger and more polluting vehicles pay more registration tax than the previous system. The new tax system for private vehicles (including self-drive, lease and garage-hire cars, and motorcycles) was introduced in January 2009.

[4] SEC(2011)342

2.18. The Vehicle Annual Circulation Tax was also reformed in 2009. The tax rate is constant for the first few years and then increases marginally to encourage the replacement of older vehicles. Under the new system, vehicles registered prior to January 2009 have a fixed licence rate for the first six years. It then increases by 13-14 per cent after the sixth year and by 1–4 per cent every year after. This tax rate is based on fuel type, year of manufacture and engine size.

2.19. For vehicles registered after January 2009, the annual circulation tax is based on fuel type, CO_2 emissions, PM_{10} emissions (for diesel engines) and vehicle age. The tax rate is constant for the first five years. It then increases by 25 per cent after the fifth year and by 10 per cent each year after.

2.20. With regards to commercial vehicles registered after 1st January 2010, the annual road tax is based on the weight and age of the vehicle. As from January 2014, the new licence fees shall also be paid for commercial vehicles registered prior to 1st January 2010.

Vehicle Scrapping Scheme

2.21. In November 2010, the Government of Malta introduced the vehicle scrapping scheme. The aim of this scheme is to encourage people to scrap (rather than sell) vehicles older than ten years, when buying a new car. The new car must have a Euro 5 engine, must be shorter than 4.46m, and have CO_2 emission levels that are less than 150g/km. The car scrapping scheme awards buyers of new cars a maximum of €2,000 and is limited to 2,000 vehicles.

MEPA Air Quality Plan for the Maltese Islands

2.22. The MEPA Air Quality Plan, published in January 2010, aims to reduce PM_{10} and NO_2 emissions in line with annual limit values set in Directive 1999/30/EC. The Plan acknowledges that the major sources of air pollution on the Maltese Islands are power generation and traffic. With respect to the latter, the Plan sets out a number of measures to achieve the following goals:

- Reduction in vehicle emissions;
- Encouraging modal shift;
- Reduce traffic impact of new developments;
- Managing the road network; and
- Promoting cleaner vehicle technologies.

2.23. The measures aim to reduce PM_{10} concentrations in order to comply with PM_{10} daily limit values by June 2011. These are split into short-term and medium-term measures. Short-term measures are defined as those that *should be implemented immediately once approved and subject to budgetary allocation where this is required, by the end of 2010*. Medium-term measures *should start later on in 2010 to produce the required results by mid-2011*. This is under the *proviso* that appropriate planning and funding is dedicated to each and every measure.

2.24. Although most measures aim to reduce transport emissions, the following short-term and long-term measures are noted:

- Short-term measures:
    - Measure 2: Enforcement of the regulation of vehicle exhaust from polluting trucks, cars, and buses;
    - Measure 7: Restrict circulation of public transport vehicles to Euro 3 buses in localities where limit values are being exceeded; and
    - Measure 12: Fiscal incentives for the acquisition of cleaner technology vehicles.
- Long-term measures:
    - Measure 1: Reform Public Transport;
    - Measure 4: Increase provision and use of park and ride facilities (Sliema is highlighted as a particularly sensitive area); and
    - Measure 14: Encourage local car dealers to promote the sale of cleaner technology vehicles. This would work well coupled with the new vehicle registration tax regime (Budget 2008).

3. AIR QUALITY ASSESSMENT

Introduction

3.1. The air quality assessment presented in the EPS (2007) was based on the DETR traffic emissions mathematical model[5]. The model is a screening tool that provides estimates of PM_{10} and NO_x conditions at varying distances from the road. It presents the results in daily / hourly concentrations.

3.2. The DETR model is just a screening tool that gives an indication of potential impacts from traffic. Following discussions between MEPA and the Applicant, it was decided to carry out a more accurate study of the air quailty impacts using appropriate modeling software called BREEZE Roads.

3.3. BREEZE Roads is an air dispersion modeling suite that predicts air quality impacts of a number of pollutants including carbon monoxide (CO), NO_2 and PM. It is specifically designed to model pollutant concentrations that are emitted from moving and idling motor vehicles at or alongside roadways and roadway intersections.

3.4. The air quality modeling was undertaken by Mr David Harvey of ADM Ltd (UK) and assisted by Adi Associates Environmental Consultants Ltd.

Methodology and Assumptions

3.5. In order to accurately model traffic emissions, the BREEZE Roads model needs to be calibrated to local conditions. This was done according to the UK guidance document *Local Air Quality Management – Technical Guidance LAQM.TG(09)* published by DEFRA[6]. The model was calibrated with traffic and air emissions data from Valley Road, Birkirkara. Calibration data was derived from:

- 24-hour traffic counts over a period of two weeks (in February – March 2011) to estimate the Annual Average Daily Traffic (AADT), average speed and percentage HGVs[7]; and
- Monthly NO_2 emissions for 2009 from the BKR1 diffusion tube station to estimate the annual average NO_2 levels.

3.6. In addition, the average age of Maltese vehicles (both cars and HGVs) was required so that the appropriate vehicle emissions factors are applied. Emission factors are used in air quality models to allow for predictions to be made of operations that are currently not in existence, or which are expected to undergo significant change in the future. In this respect, the factors are used to predict emissions from future vehicle fleet compositions.

[5] Highways Agency (UK) Design Manual for Rods and Bridges.
[6] Department for Environment, Food and Rural Affairs
[7] Heavy Goods Vehicles > 3.5 tonnes

3.7. The emissions factors used in the model are produced by DEFRA and hence mirror the past and present vehicle fleet in the UK. The UK average vehicle age is seven years, compared to Malta's 13.8 years[8] as at the end of 2010. This implies that currently, the Maltese emission factors are seven years behind those of the UK. This means that the emission factors of the current fleet (2010) are equivalent to the UK emission factors of 2003. It is, however, noted that the current (as at end November 2010) average age for motor vehicles (i.e. cars only) is 12.2[9].

3.8. Other data was required for both the model calibration and for modelling the impacts of the Scheme. These consisted of:

- 2009 NO_2 and PM_{10} levels at an urban background site;
- 2009 meteorological data;
- AADT along Triq ix-Xatt ta' Qui-Si-Sana for the different modelling scenarios;
- Percentage HGVs along Triq ix-Xatt ta' Qui-Si-Sana for all scenarios; and
- Annual average speeds along Triq ix-Xatt ta' Qui-Si-Sana for all scenarios.

3.9. Air quality data for 2009 from an urban background site was provided from the Zejtun Air Monitoring Station at Gnien San Girgor. It is noted that the model assumes that the background concentrations remain the same in the scenario years.

3.10. Two scenarios were developed for the Scheme. The AADT flows along Triq ix-Xatt ta' Qui-Si-Sana were derived from weekend AM peak hour flows extracted from the TIS Update[10] to present a worst-case scenario:

- Scenario 1 (2017 without development): 24,444 vehicles; and
- Scenario 2 (2017 with development): 28,874 vehicles.

3.11. Scenario 1 comprises 2017 base network traffic, together with traffic generated by the Fort Cambridge and MIDI developments. It is noted that while traffic data for the Scheme, Fort Cambridge and MIDI have been retained as per the 2007 EPS and TIS, Qui-Si-Sana Car Park data has been excluded because this development has been abandoned.

3.12. For all scenarios, it was assumed that the percentage HGVs passing along Triq ix-Xatt ta' Qui-Si-Sana is 5.1 per cent. This is based on the percentage of HGVs on the

[8] NSO, Email Communication, 9 March 2011.
[9] Transport Malta, E-mail Communication, April 2011
[10] Adi Associates Environmental Consultants Ltd, David V. Camilleri 2007. Sliema Townsquare. Update to the Traffic Impact Statement prepared in support of development permit application No. PA 01191/05. San Gwann, September 2007; 27pp.

Maltese roads as at end 2010[11]. On the other hand, the average speed along Triq ix-Xatt ta' Qui-Si-Sana was set at 30km/hr[12] for both scenarios.

3.13. Two sensitive receptors were identified. At each receptor, the emission values of NO_2 and PM_{10} was modelled for both scenarios. The chosen receptors are pedestrians along Triq ix-Xatt ta' Qui-Si-Sana and users of Gnien George Bonello du Puis.

Assessment Criteria

3.14. Air Quality Impact descriptors for PM_{10} and NO_2 are based on the change in the annual mean concentrations. **Table 3.2** sets out the descriptors of change in the context of traffic emissions to air.

Table 3.2: Air impact descriptors of changes in annual mean NO_2 and PM_{10} concentrations[13]

Magnitude of change (significance descriptor)	Annual mean
Large (major)	Δ[P] > 4 µg/m3
Medium (moderate)	2 µg/m3 < Δ[P] ≤ 4 µg/m3
Small (slight)	0.4 µg/m3 ≤ Δ[P] ≤ 2 µg/m3
Imperceptible (negligible)	Δ[P] < 0.4 µg/m3

Results

3.15. The results for each sensitive receptor are shown in **Tables 3.3** and **3.4**. These are based on the scenario where the average vehicle age in Malta and the UK is identical. This is based on the assumptions described above namely that as a result of EU and local government initiatives to improve air quality and vehicle emissions, together with the fact that after September 2015, all new cars sold in Member States must be Euro 6 compliant, there will be a significant improvement in the vehicle fleet. This will result in an aggressive vehicle fleet replacement process with the average vehicle age improving each year until it reaches seven years by 2017.

Table 3.3: Predicted emissions at the public garden (Gnien George Bonello du Puis) assuming an average vehicle age of 7 years

	2017 Baseline (µg/m^3)	2017 with Development (µg/m^3)	Change (µg/m^3)	Impact
Total Predicted NO_2	24.6	25.6	1.0	slight
Total Predicted PM_{10}	29.3	29.5	0.2	negligible

[11] NSO, Email Communication, 2 March 2011.
[12] Transport Malta, Email Communication, 2 March 2011.
[13] These criteria were provided by MEPA in Terms of Reference for EIAs undertaken in 2010.

Table 3.4: Predicted emissions at Triq ix-Xatt ta' Qui-Si-Sana assuming an average vehicle age of 7 years

	2017 Baseline ($\mu g/m^3$)	2017 with Development ($\mu g/m^3$)	Change ($\mu g/m^3$)	Impact
Total Predicted NO_2	31.5	33.8	2.3	moderate
Total Predicted PM_{10}	30.9	31.5	0.6	slight

3.16. At the Gnien George Bonello du Puis sensitive receptor, the additional 4,430 vehicles result in a 1.0$\mu g/m^3$ increase in NO_2 emissions and a 0.2$\mu g/m^3$ increase in PM_{10} emissions. The increase in NO_2 emissions is considered of slight significance whereas that of PM_{10} is considered as negligible, in accordance with the criteria set out in **Table 3.2**.

3.17. As for pedestrians along Triq ix-Xatt ta' Qui-Si-Sana, the Scheme traffic will result in increases of 2.3$\mu g/m^3$ in NO_2 emissions and of 0.6$\mu g/m^3$ in PM_{10} emissions. The increase in NO_2 emissions is considered of moderate significance whereas that of PM_{10} is considered of slight significance.

3.18. A second scenario was also modelled where the average age of Maltese vehicles by 2017 does not reach the UK 7 year figure but remains at 10 years. This is also in line with the Government's car scrapping scheme that targets vehicles that are 10 years or more. It is noted that policy papers such as the Air Quality Plan do not contain any targets with regards to vehicle age, so the assessment relies on certain assumptions. This scenario therefore assesses the impacts of the Scheme assuming that the age gap between UK and Maltese vehicles reduces from seven to three years. This means that if by 2017, the UK average vehicle age remains at 7 years, the Maltese vehicle average age will decrease from the current 14 to 10 years.

3.19. The results, shown in **Tables 3.5** and **3.6**, demonstrate that the impact significance of the increase in NO_2 and PM_{10} emissions, for both sensitive receptors, in the equivalent average vehicle age scenario and the three-year gap scenario is the same.

Table 3.5: Predicted emissions at public garden assuming an average vehicle age of 10 years

	2017 Baseline ($\mu g/m^3$)	2017 with Development ($\mu g/m^3$)	Change ($\mu g/m^3$)	Impact
Total Predicted NO_2	28.4	30.1	1.5	slight
Total Predicted PM_{10}	29.5	29.8	0.3	negligible

Table 3.6: Predicted emissions at Triq ix-Xatt ta' Qui-Si-Sana assuming an average vehicle age of 10 years

	2017 Baseline ($\mu g/m^3$)	2017 with Development ($\mu g/m^3$)	Change ($\mu g/m^3$)	Impact
Total Predicted NO_2	39.9	43.7	3.4	moderate
Total Predicted PM_{10}	31.4	32.0	0.6	slight

3.20. At the Gnien George Bonello du Puis sensitive receptor, the additional vehicles result in a 1.5µg/m^3 increase in NO_2 emissions and a 0.3µg/m^3 increase in PM_{10} emissions. At the pedestrians' sensitive receptor, the Scheme traffic will result in increases of 3.4µg/m^3 in NO_2 emissions and of 0.6µg/m^3 in PM_{10} emissions.

CONCLUSION

3.21. The impact of the Scheme on sensitive receptors at the Gnien George Bonello Du Puis is considered to be negligible for PM_{10} and slight for nitrogen dioxide while that on sensitive receptors on ix-Xatt ta' Qui Si Sana is slight for PM_{10} to moderate for nitrogen dioxide. It is anticipated that with time the emissions from vehicles will improve including those emissions from HGVs and as the average age of the fleet decreases, then the emissions would decrease further. In this regard it is pertinent to note that while the average age of vehicles (including HGVs) in Malta is 13.8, that of motor vehicles is 12.2. Since the Scheme is largely residential it is anticipated that mostly traffic from motor vehicles will be generated, thus emissions are likely to be lower than those estimated.

3.22. In order to further reduce the impact of emissions, it is proposed that the Applicant undertakes a Green Travel Plan that would help to reduce traffic movements in and out of the Scheme for both the commercial and the residential components of the scheme. Typically the Green Travel Plan will take the following stages:

- Stage1- Understanding travel needs of the future tenants of the Scheme;
- Stage 2 – Establishing measures and targets promoting sustainable travel patterns; and
- Stage 3 - Monitoring and Implementation by a designated person such as a Travel Plan Coordinator.