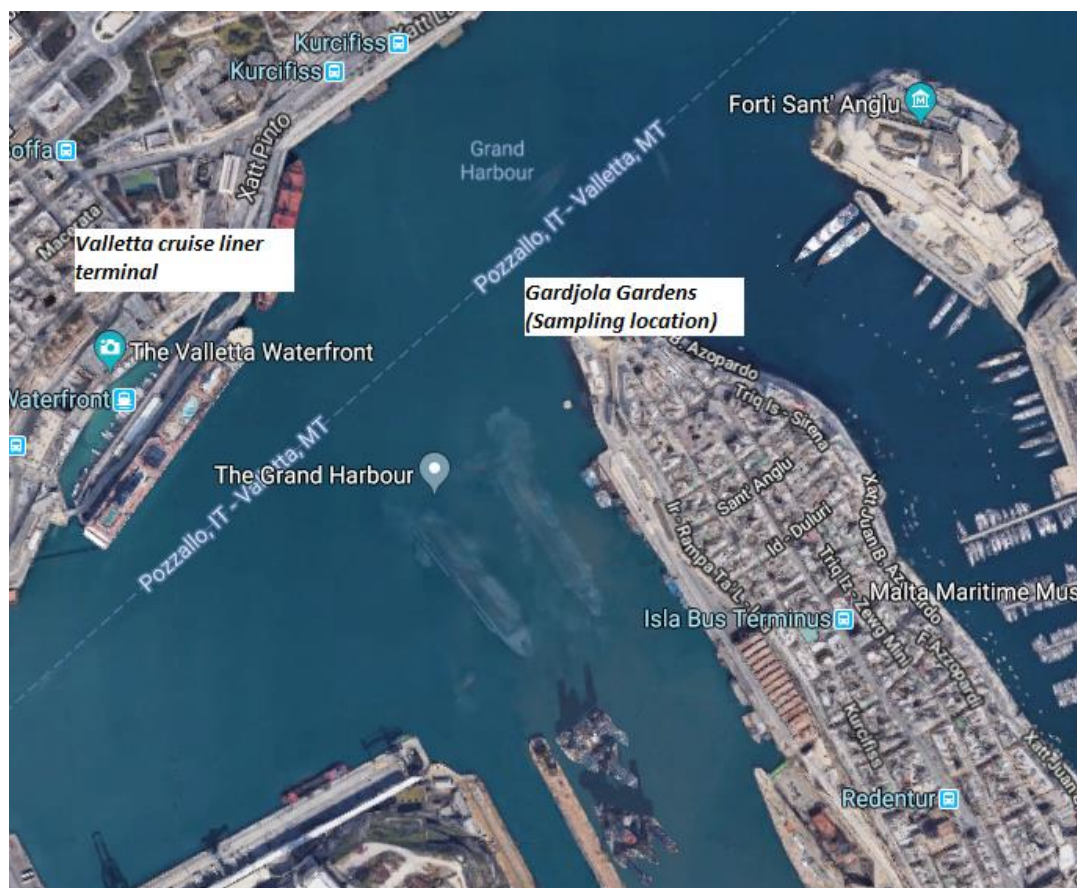


RESULTS OF AIR QUALITY MEASUREMENT EXERCISE CARRIED OUT ON THE 23RD AND 24TH JUNE 2018 AT VALLETTA CRUISE PORT BY BIRDLIFE MALTA AND NABU

Summary: One-time readings of air quality, particularly ultrafine particles and Nitrogen dioxide (NO₂) were taken at different locations in Malta on the 23rd and 24th June 2018, in relation to cruise liner activity within the Grand Harbour.

Triq Aldo Moro in Marsa was also measured in order to compare levels of ultrafine particles generated from vehicle traffic in a very busy area of Malta.



1. Ultrafine particle measurements taken at Gardjola Gardens in Senglea

Wind Direction: North West with emissions recorded down-wind at Senglea

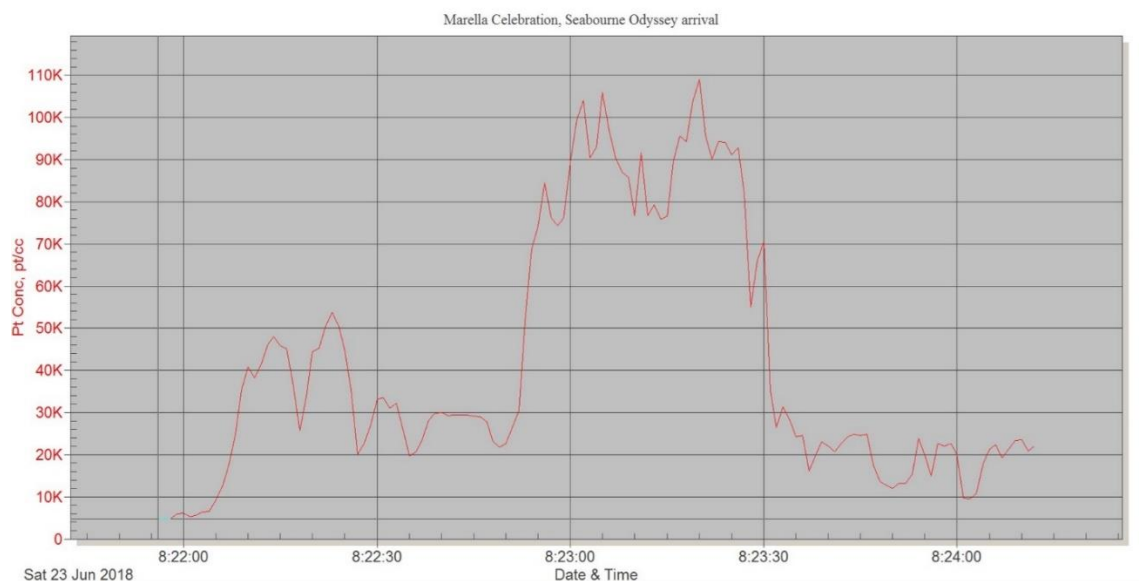


Figure 1: Ultrafine particle measurements taken at Senglea, with one cruise liner berthed in Valletta, and a second cruise liner arriving. Maximum concentration peaked at 110,000 pt/cm³ of ultrafine particles

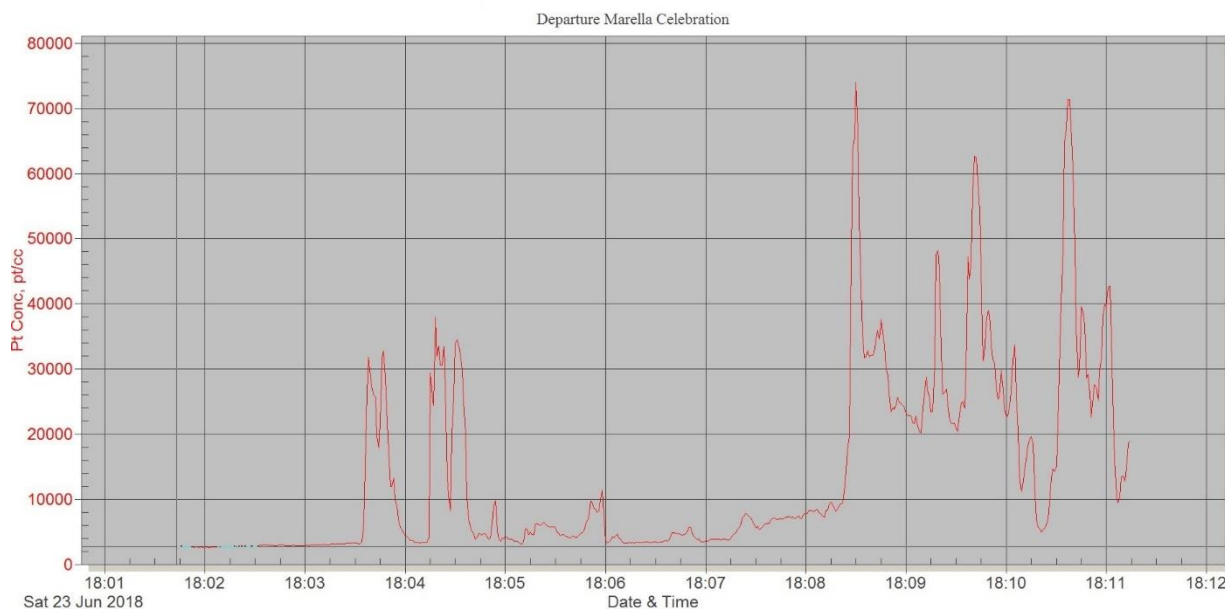


Figure 2: Ultrafine particle measurements taken at Senglea, with two cruise liners berthed in Valletta, and a third cruise liner leaving. Maximum concentration peaked at 74,000 pt/cm³ of ultrafine particles

2. Nitrogen dioxide measurements taken at Gardjola Gardens in Senglea

Wind Direction: North West with emissions recorded down-wind at Senglea



Figure 3: Nitrogen dioxide measurements taken at Senglea, with one cruise liner berthed in Valletta, and a second cruise liner arriving. Maximum concentration peaked at 66 ppb equivalent to 135 $\mu\text{g}/\text{m}^3$ of NO₂



Figure 4: Nitrogen dioxide measurements taken at Senglea, with two cruise liners berthed in Valletta, and a third cruise liner leaving. Maximum concentration peaked at 81 ppb equivalent to 166 $\mu\text{g}/\text{m}^3$ of NO₂

3. Ultrafine particle measurements taken at Triq Aldo Moro, Marsa

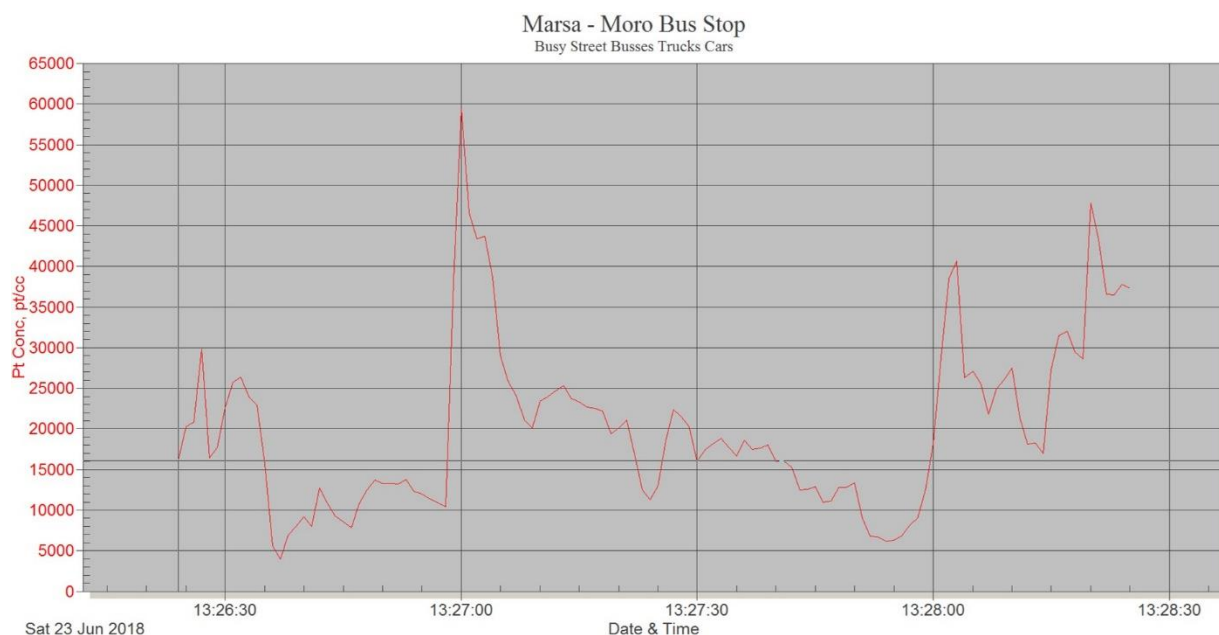


Figure 5: Ultrafine measurements taken at Triq Aldo Moro Marsa. Average concentration at this busy road was around 16,000 pt/cm³ of ultrafine particles

EU guidelines:

The European Union has developed an extensive body of legislation which establishes health based standards and objectives for a number of pollutants present in the air. These standards and objectives are summarised in the table below:

<i>Pollutant</i>	<i>Concentration</i>	<i>Averaging period</i>	<i>Permitted exceedances each year</i>
Nitrogen dioxide (NO ₂)	200 µg/m ³	Average value for 1 hour	18
	40 µg/m ³	Average value for 1 year	n/a

Source: <http://ec.europa.eu/environment/air/quality/standards.htm>

Ultrafine particles, despite their health implications, are not covered by EU legislation which considers only limits for larger sized particles (PM₁₀ and PM_{2.5})